

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

Principal Bench, New Delhi

Original Application No. 519/2019

With

Original Application No. 386/2019

In the matter of: -

News item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh Titled  
"Below mountains of trash lie poison lakes"

With

Centre for Wildlife & Environment Litigation

Applicant(s)

Vs.

Union of India & Ors.

Respondent(s)

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(Divya Sinha)

Scientist-E

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

Date: 28.01.2021

Place: Delhi

**CENTRAL POLLUTION CONTROL BOARD, DELHI**

January 25, 2020

**STATUS REPORT IN THE MATTER OF O.A NO. 519 OF 2019 WITH O.A. NO. 386/2019, TITLED AS NEWS ITEM PUBLISHED IN "THE TIMES OF INDIA" AUTHORED BY JASJEEV GANDHIK & PARAS SINGH, TITLED "BELOW MOUNTAINS OF TRASH LIE POISON LAKES" WITH CENTRE FOR WILDLIFE AND ENVIRONMENT LITIGATION VS UOI & ORS**

**1.0 BACKGROUND:-**

Vide Order dated 23.03.2020 in the aforesaid matter regarding bio mining of Bhalswa, Gazipur and Okhla dumpsites of Delhi, Hon'ble National Green Tribunal directed as follows:

**"Para 19:** "----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.

**Para 23:** CPCB may also ascertain the achievement in next two months and give its independent report.

**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:

<b>S.No.</b>	<b>Name of Municipal Corporation</b>	<b>Name of Dumpsite</b>	<b>Damage Cost assessed, (Rupees)</b>
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
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In compliance of Para 23 of aforesaid Hon'ble NGT's Order, CPCB officials inspected Bhalswa, Ghazipur and Okhla dumpsites during 14 -21 January,2021 and 16 -22 September,2020.

### 3.0 Observations: -

An overview of the observations made during the inspection is given in Table 1. The detailed inspection reports of the legacy waste management through bioremediation at these sites are enclosed at **Annexure B to D**.

**Table 1:** Overview of the CPCB observations made during inspection of three Dumpsites in Delhi

S. No.	Name of the dumpsite	Quantity of legacy waste dumped	Quantity of legacy waste being processed (TPD)	Total quantity of legacy waste processed so far	No. of trommels operational		Quantity of fresh waste being dumped (TPD)	Annexures of inspection report
					30 mm screen	6 mm screen		
1	Ghazipur	140 Lakh Ton	3300	3.5 Lakh Ton	11	4	1450	Annexure-B
2	Okhla	60 Lakh Ton	1800	3.1 Lakh Ton	6	4	1800	Annexure-C
3	Bhalswa	80 Lakh Ton	4500	11.5 Lakh Ton	15	4	2000	Annexure -D
<b>Total</b>	<b>280 Lakh Ton</b>	<b>9600</b>	<b>18.1 Lakh Ton</b>	<b>32</b>	<b>12</b>	<b>5250</b>		

### 3.1 Stabilization of Waste: -

Waste stabilization through bio-remediation is being practiced at all three dumpsites. Windrow method has been adopted and bio culture is being sprayed over windrows to stabilize the waste prior to screening. Good stabilization of waste is observed at Ghazipur and Okhla, however, at Bhalswa, proper windrows are not prepared and generation of fumes from stabilized waste is observed which indicates poor stabilization of waste.

### 3.2 Screening of Waste: -

- The screening of waste is currently being done in trommels of 2 screen sizes (30 mm and 6 mm) at all the 3 dumpsites.
- The screened fractions are under 6 mm fraction (soil enricher), Refuse Derived Fuel (RDF), Construction & Demolition (C & D) waste and inerts.
- Proper arrangement for preparation of RDF as per MoHUA Guidelines has not been made and only a fan has been provided at outlet of trommels. No process control measure implemented for improving quality of RDF.

### **3.3 Testing of Screened fractions**

- Testing of under 6 mm fraction has been carried out by all the three dumpsites. As per the analysis of under 6 mm fraction carried out by Ghazipur and Okhla in September, 2020, the fraction complies with the limits specified for heavy metal but does not comply for Total Organic Carbon (TOC), C/N ratio, Nitrogen, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O specified for Organic Compost as specified in Schedule II of SWM Rules 2016. As per Bhalswa's test report of below 6 mm fraction carried out in October, 2020, the fraction does not comply with most of the parameters (namely TOC, Nitrogen, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O<sub>5</sub>, density, moisture content, Chromium & Nickel).
- RDF testing as specified in MoHUA Guidelines on usages of RDF under Segregated Combustible Fraction (SCF) has not been carried out at the three dumpsites since last one year.
- Testing of the screened fractions is not being done on continuous basis.

### **3.4 Disposal of Different Fractions:** -

**At Ghazipur**, as informed, RDF generated is being sent to Waste to Energy plant at Ghazipur and less than 6 mm fraction is being sent to Eco park, NTPC Badarpur and EDMC parks. C&D waste is utilized in road repair at dumpsite. Inerts (< 30 mm fraction) have been sent to low laying area at Vinod Nagar.

**At Okhla**, as informed, RDF generated is being sent to Waste to Energy plant at Okhla. Less than 6 mm fraction, some amount of inerts & C & D waste have been utilized onsite, inerts are also being sent to low lying areas at Jaitpur & Eco park, NTPC. Some amount of screened fractions are dumped on site.

**At Bhalswa**, RDF is being sent to Waste to Energy plant, Bawana. Inerts including less than 6 mm fraction are being dumped at low lying areas at Mukundpur primary school, Horticulture park Bhalswa Dairy and NTPC Badarpur. Further, as informed, approx. 4.5 lakh ton screened fractions are dumped on site.

**Improvement in disposal of screened fractions has been observed, however, the plan for disposal of screened fractions at all the three dumpsites is still not sufficient and some amount of screened fractions are still dumped on—site.**

- 3.5 As informed, height of Bhalswa and Ghazipur dumpsites has been reduced by 11 m and 9 m respectively.**
- 3.6** Bioremediation/bio mining process is being carried out at very slow rate and only approx. 18 lakh ton legacy waste has been biomineried out of total 280 lakh ton legacy waste dumped at the 3 dumpsites in last more than one year which is only 6% of total legacy waste dumped.
- 3.7** Work is being executed on piece meal basis and no comprehensive time bound action plan for bio-remediation, including timeframe for clearance of dumpsite, utilization of screened fractions has been prepared for bioremediation of the three dumpsites.
- 3.8** Leachate is being generated, however, leachate treatment is not being carried out at any of these dumpsites. Some quantity of leachate is being recirculated over windrows at Okhla and Gazipur site.
- 3.9** Fresh waste is being dumped at all the three dumpsites.
- 3.10** The bio-remediation is being carried out in the open. No shed has been provided in the bio-remediation and trommel area in absence of which work may be hampered during rain.
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**Report on “Assessment of amount  
of Damage to Environment due to  
Three Dumpsites in Delhi”  
prepared by Joint *Committee*  
*comprising*  
*CPCB, NEERI & IIT-Delhi***

**(In the matter of OA No. 519/2019)**

***(January, 2021)***

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# **Damage Assessment due to Three Dumpsites in Delhi (Bhalswa, Ghazipur & Okhla) in the matter of OA No. 519/2019**

## **1.0 Introduction**

### **1.1 NGT directions:**

In the matter of OA 519/2019, Hon'ble National Green Tribunal issued the following Directions:

*“-----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.*

### **1.2 Constitution of Committee:**

In compliance of Hon'ble NGT's Order, a Committee comprising of following members was constituted:

- Dr.S.K.Goyal, Chief Scientist and Head, NEERI Delhi Zonal Center
- Dr. Venkata .Ramana Gunturi, Professor, Department. of Civil Engg., IIT-Delhi
- Officials of UPC II Div., CPCB

Four meetings of the committee were held through video conferencing on 11-8-2020, 23-10-2020, 29-10-2020 and 3-12-2020 to deliberate upon the matter. The Minutes of the meeting are placed at **Annexure I**

## **2.0 Baseline data collection**

### **2.1 Questionnaire based data collection**

Questionnaire for collection of baseline data of the three dumpsites was prepared and sent to the three concerned Municipal Corporations. Information as received from the three dumpsites Bhalswa, Ghazipur & Okhla is placed at **Annexure II A, B & C** respectively

Key observations based on the information provided by the concerned authorities includes the following:

- (i) The three Dumpsite sites were started as early as in the year 1984 – Ghazipur 1994 – Bhalswa, and 1996 – Okhla, taking care of disposal of MSW from the three MCDs (East, North and South respectively)
- (ii) Substantial development has taken in the surrounding areas of these Dumpsite sites (residential, commercial & industrial activities) place over the years

- (iii) Fresh waste is continued to be disposed at the three sites. The current status of waste disposal is given in **Table 1**.

**Table 1: Status of Waste Disposal at the three Dumpsites of Delhi**

Sr. No.	Name of the dumpsite	Area covered (Acres)	Quantity of legacy waste dumped ( lakh ton)	Height of dumpsite, m	Qty of fresh waste being dumped (TPD)
1	Bhalswa	70	80	54	2000
2	Ghazipur	70	140	56	1450
3	Okhla	46	60	40	1800
		<b>Total</b>	280	<b>Total</b>	5250

- (iv) Bio mining is being carried out at all three sites. However, less than 5% of waste has been bio-remediated at the three sites
- (v) Legacy waste is being segregated into four fractions using trommels namely- Refused derived fuel, C&D Waste, Inert fractions and soil enricher
- (vi) Potential sources of air pollution at the sites include the following:
- 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 incidents
- (vii) Potential sources of water pollution at the sites include the following:
- Leachate being generated at all the three dumpsites
- (viii) Air Pollution control measures:
- The measures taken at the sites mainly includes sprinkling of water. It has been informed by the authorities that smog guns are being procured for control of air pollution.
- (ix) Water Pollution Control measures:
- No concrete measures for leachate concrete measures for leachate collection and treatment have being taken at the three dumpsites. As informed by the concerned authorities, leachate is partially being recirculated for stabilization of waste and remaining is discharged in

nearby surface water drains. Actual details regarding quantity of leachate used/ discharged not provided by the concerned authorities.

(x) Solid waste management:

- Fresh mixed waste is dumped at all the three dumpsites.
- RDF generated from the bio mining is sent to the three Waste to Energy plants which are located on closed vicinity of the three dumpsites. RDF from Bhalswa is also sent to Jabalpur
- All three dumpsites have reported that fraction < 6 mm fraction is sent to NTPC Eco park and other green areas
- Inert fractions after bioremediation are being used for road making, disposed in Dumpsite site etc.

## 2.2 Leachate Analysis

Samples of leachate waste collected from all three dumpsites and analysis of the same is given in Table 2.

**Table 2: Leachate analysis results of dump sites**

Sr. No.	Parameters	Standards for discharge (Inland surface water) (mg/L)	Bhalswa (mg/L)	Ghazipur (mg/L)	Okhla (mg/L)
1	pH	5.5 to 9.0	-	8.51	-
2	BOD	30	339	432	913
3	COD	250	4589	4762	5128
4	TSS	100	149	478	622
5	TDS	2100	15008	15290	19276
6	Cl	1000	-	6731	-
7	CN	0.2	0.12	0.132	3.38
8	Phenol	1.0	-	BDL	-
9	NH3-N	50	-	3360	-
10	As	0.2	0.08	0.13	0.15
11	Cd	1.0	BDL	BDL	BDL
12	Cr	2.0	1.23	0.56	0.76
13	Cu	3.0	-	0.73	0.41
14	Ni	3.0	0.3	0.35	0.32
15	Pb	0.1	0.07	0.21	0.1
16	Zn	15	0.33	0.52	0.62

17	Hg	0.01	BDL	BDL	-
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- Data not available; All values are in mg/L except pH

Based on the analysis results, following are the observations:

- a) Concentration of TDS, TSS, COD & BOD has exceeded the stipulated norms at all the three dumpsites.
- b) Concentration of NH<sub>3</sub>-N & Chloride is much higher than the stipulated norms. at Ghazipur. Concentration values of these are not available for the other two sites.
- c) Concentration of cyanide has exceeded the stipulated norms at Okhla.
- d) Concentration of Heavy metals is within the stipulated norms with the exception of lead which has marginally exceeded the permissible limits at Ghazipur.

### 3.0 Air & Water Quality Status

Assessment of Ambient Air, Surface & Ground Water quality as per monitoring data CPCB for the past three years was carried out. 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. The findings of the assessment have been presented in the following sections.

#### 3.1 Air Quality

##### 3.1.1 Air Quality Stations within 5km of dumpsites

The number of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) located within a radius of five km from the Bhalswa, Ghazipur & Okhla dumpsite is five, three & two respectively. Details of these stations are given in **Table 3, 4 & 5** respectively. Locations of these stations near Bhalswa, Ghazipur and Okhla stations are presented in **Fig 1, 2 & 3** respectively

**Table 3: CAAQM Stations within 5 km of Bhalswa Dumpsite**

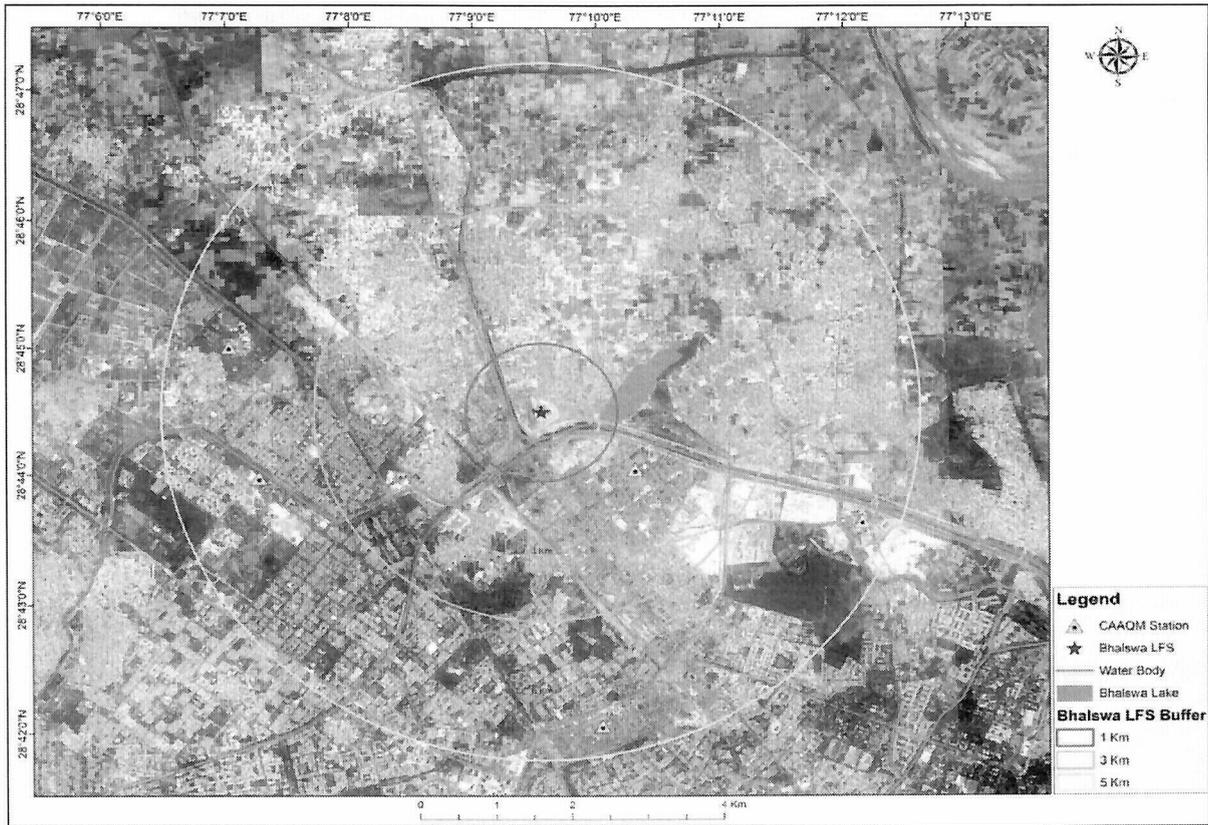
Sr. No.	Buffer Zone	Name of Station	Latitude	Longitude	Direction & Distance (km) from LFS
1	1-3 Km	Jahangirpuri, Delhi – DPCC	28.73282	77.170633	SE & 1.5
2	3-5 Km	Rohini, Delhi – DPCC	28.732528	77.11992	SW & 3.8
3	3-5 Km	DTU, Delhi – CPCB	28.749722	77.116281	NW & 4.2
4	3-5 Km	Burari Crossing, Delhi – IMD	28.72565	77.201157	SE & 4.5
5	3-5 Km	Wazirpur, Delhi – DPCC	28.699793	77.165453	S & 4.6

**Table 4: CAAQM Stations within 5 km of Ghazipur Dumpsite**

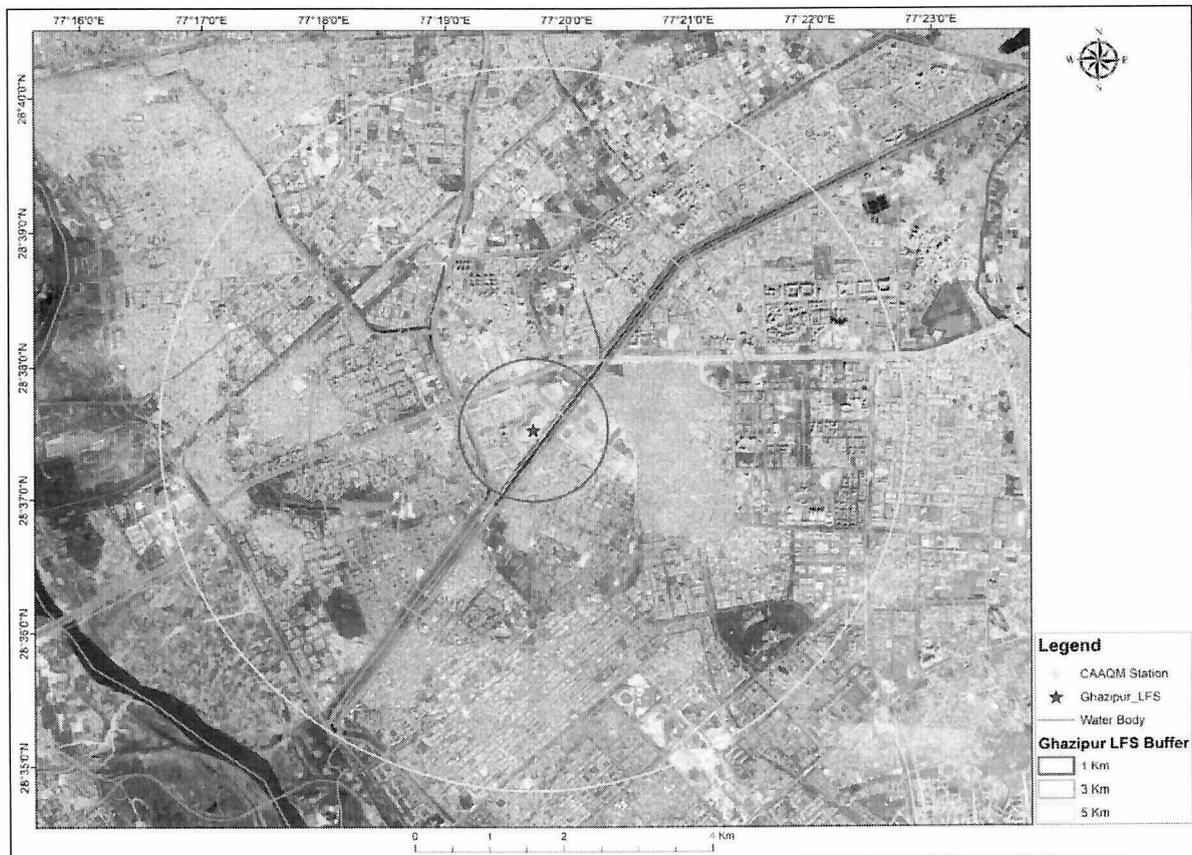
Sr. No.	Buffer Zone	Name of Station	Latitude	Longitude	Direction & Distance (km) from LFS
1	1-3 Km	Anand Vihar, Delhi – DPCC	28.646835	77.316032	NW & 2.7
2	3-5 Km	Patparganj, Delhi – DPCC	28.623748	77.287205	W & 3.9

**Table 5: CAAQM Stations within 5 km of Okhla Dumpsite**

Sr. No.	Buffer Zone	Name of Station	Latitude	Longitude	Direction & Distance (km) from LFS
1	1-3 Km	Dr. Karni Singh Shooting Range, Delhi – DPCC	28.498571	77.26484	SW & 2.4
2	1-3 Km	Okhla Phase-2, Delhi - DPCC	28.530785	77.271255	NW & 2.4
3	3-5 Km	CRRI Mathura Road, - IMD	28.551201	77.273574	N & 4.4



**Fig. 1: Location of CAAQMS within 5 km of Bhalswa Site**



**Fig. 2: Location of CAAQMS within 5 km of Ghazipur Site**



**Fig. 3: Location of CAAQMS within 5 km of Okhla Site**

### 3.1.2 Air Quality within 5km radius from dumpsites

Air Quality monitoring data for the above-listed stations for the last three years as available with CPCB has been compiled and is placed at **Annexure III**. The Annual Average value of the monitored air quality parameters is given in **Table 6, 7 & 8** respectively in the surrounding area of Bhalswa, Ghazipur and Okhla Dumpsite site.

**Table 6: Air Quality Status in the Surrounding Area of Bhalswa Dumpsite Site**

Sr. No.	Year	Pollutant Concentration ( $\mu\text{g}/\text{m}^3$ ) Annual Average Values					
		PM10	PM2.5	SO2	NO2	NH3	Benzene
<b>1.</b>	<b>Jahangirpuri (1.5 km from LFS in SE Direction)</b>						
	2018	<b>304</b>	<b>131</b>	-	-	-	-
	2019	<b>253</b>	<b>129</b>	19	<b>65</b>	50	5
	2020	<b>161</b>	<b>79</b>	5	<b>64</b>	55	-
<b>2.</b>	<b>Rohini (3.8 km from LFS in SW Direction)</b>						
	2018	<b>293</b>	<b>127</b>	-	-	-	-
	2019	<b>241</b>	<b>129</b>	13	34	49	3
	2020	<b>157</b>	<b>81</b>	7	19	56	2

<b>3.</b>	<b>DTU (4.2 km from LFS in SW Direction)</b>						
	2018	<b>236</b>	<b>123</b>	-	-	-	-
	2019	<b>232</b>	<b>119</b>	12	<b>48</b>	32	<b>6</b>
	2020	<b>168</b>	<b>77</b>	10	26	15	3
<b>4.</b>	<b>Burari Crossing (4.5 km from LFS in SE Direction)</b>						
	2018	<b>217</b>	<b>126</b>	-	-	-	-
	2019	<b>179</b>	<b>110</b>	-	37	-	-
	2020	-	-	-	-	-	-
<b>5.</b>	<b>Wazirpur (4.6 km from LFS in S Direction)</b>						
	2018	<b>316</b>	<b>137</b>	-	-	-	-
	2019	<b>288</b>	<b>136</b>	16	<b>60</b>	45	4
	2020	<b>160</b>	<b>76</b>	16	36	37	3
<b>CPCB Standards Annual Average</b>		<b>60</b>	<b>40</b>	<b>50</b>	<b>40</b>	<b>100</b>	<b>5</b>

- : Data not Available

**Table 7: Air Quality Status in the Surrounding Area of Ghazipur Dumpsite Site**

Sr. No.	Year	Pollutant Concentration ( $\mu\text{g}/\text{m}^3$ ) Annual Average Values					
		PM10	PM2.5	SO2	NO2	NH3	Benzene
<b>1.</b>	<b>Aanand Vihar (2.7 km from LFS in NW Direction)</b>						
	2018	<b>341</b>	<b>156</b>	-	-	-	-
	2019	<b>275</b>	<b>129</b>	13	<b>88</b>	54	4
	2020	<b>143</b>	<b>74</b>	13	<b>44</b>	33	3
<b>2.</b>	<b>Patparganj (3.9 km from LFS in W Direction)</b>						
	2018	<b>216</b>	<b>102</b>	-	-	-	-
	2019	<b>192</b>	<b>100</b>	4	20	49	2
	2020	<b>111</b>	<b>60</b>	6	14	49	0

- : Data not Available

**Table 8: Air Quality Status in the Surrounding Area of Okhla Dumpsite Site**

Sr. No.	Year	Pollutant Concentration ( $\mu\text{g}/\text{m}^3$ ) Annual Average Values					
		PM10	PM2.5	SO2	NO2	NH3	Benzene
<b>1.</b>	<b>Dr. Karni Singh Shooting Range (2.4 km from LFS in SW Direction)</b>						
	2018	199	84	-	-	-	-

	2019	<b>195</b>	<b>97</b>	15	43	31	4
	2020	<b>119</b>	<b>56</b>	11	28	23	2
<b>2.</b>	<b>Okhla Phase-2 (2.4 km from LFS in NW Direction)</b>						
	2018	252	106	-	-	-	-
	2019	<b>216</b>	<b>107</b>	13	40	34	5
	2020	<b>138</b>	<b>64</b>	14	30	34	2
<b>3.</b>	<b>CRRI Mathura Road (4.4 km from LFS in N Direction)</b>						
	2018	257	130	-	-	-	-
	2019	<b>213</b>	<b>104</b>	-	<b>52</b>	-	-
	2020	<b>146</b>	<b>65</b>	-	35	-	-
<b>CPCB Standards Annual Average</b>		<b>60</b>	<b>40</b>	<b>50</b>	<b>40</b>	<b>100</b>	<b>5</b>

- : Data not Available

Following are the major observations:

- (i) PM<sub>10</sub> & PM<sub>2.5</sub> concentrations exceeded the prescribed values at all monitored stations upto 5 km distance from the Dumpsite sites
- (ii) SO<sub>2</sub> & NH<sub>3</sub> concentrations are within the prescribed values at all monitored stations
- (iii) Benzene has exceeded the stipulated limited at DTU station (4.2 km from Bhalswa) in 2019
- (iv) NOx has exceeded the permissible limit at 7 monitored stations as per the details given below:

			<b>Distance from LFS</b>
a)	Jahangirpuri (Bhalswa)	: 2019, 2020	1.5 km
b)	DTU (Bhalswa)	: 2019	4.2 km
c)	Wazirpur (Bhalswa)	: 2019	4.6 km
d)	Anand Vihar (Ghazipur)	: 2019, 2020	2.7 km
e)	Dr.Karni Singh (OKhla)	: 2019	2.4 km
f)	Okhla Phase II (Okhla)	: 2019	2.4 km
g)	CRRI Mathura Road (Okhla)	: 2019	4.4 km

### 3.2 Water Quality

#### 3.2.1 Water Quality Monitoring Stations

The number of Water Quality Monitoring Stations (WQMS) located within a radius of five km from the Bhalswa, Ghazipur & Okhla dumpsite is five, eight & four respectively.

Details of these stations are given in **Table 9, 10 & 11** respectively. Locations of these stations near Bhalswa, Ghazipur and Okhla Dumpsite sites are shown in **Fig. 4, 5 & 6** respectively.

**Table 9: WQMS within 5 km of Bhalswa Dumpsite**

Sr. No.	Object/ Source	Sampling Location (Legend Index)	Latitude	Longitude	Direction & Distance (km) from LFS	Buffer Zone	Station Code
1.	GW	Well at Haiderpur (G1)	28.72249	77.1447	SW & 2.4	1-3 Km	3494
2.	GW	Well at Burari (G2)	28.755	77.199	NE & 4.3	3-5 Km	3483
3.	Lake	Bhalswa Lake (L)	28.74167	77.172	E & 1.4	1-3 Km	3031
4.	Canal	WYC at Haiderpur Water Works (C)	28.72121	77.13968	SW & 2.8	1-3 Km	1479
5.	WTP (Raw)	Haiderpur Water Works (W)	28.72133	77.14031	SW & 2.8	1-3 Km	3045

**Table 10: WQMS within 5 Km of Ghazipur Dumpsite**

Sr. No.	Object/ Source	Sampling Location (Legend Index)	Latitude	Longitude	Direction & Distance (km) from LFS	Buffer Zone	Station Code
1.	GW	Well at Gajipur (G1)	28.62995	77.32026	NW & 0.9	0-1 Km	3492
2.	GW	Well at Mayur Vihar (G2)	28.61463	77.31216	SW & 1.4	1-3 Km	3516
3.	GW	Well at Patparganj	28.63944	77.31096	NW & 2.3	1-3 Km	3527

		Indl Area (G3)					
4.	GW	Well at Trilokpuri (G4)	28.60468	77.30689	SW & 3.0	1-3 Km	3543
5.	GW	Well at Priya Enclave (G5)	28.653	77.29906	NW & 4.2	3-5 Km	3530
6.	GW	Well at Patpar Ganj (G6)	28.61225	77.28569	SW & 4.3	3-5 Km	3526
7.	GW	Well at Parivesh Bhawan (G7)	28.65571	77.29512	NW & 4.7	3-5 Km	3523
8.	Lake	Sanjay Lake (L1)	28.61519	77.29287	SW & 3.5	3-5 Km	3030

GW – Ground water from Borewell

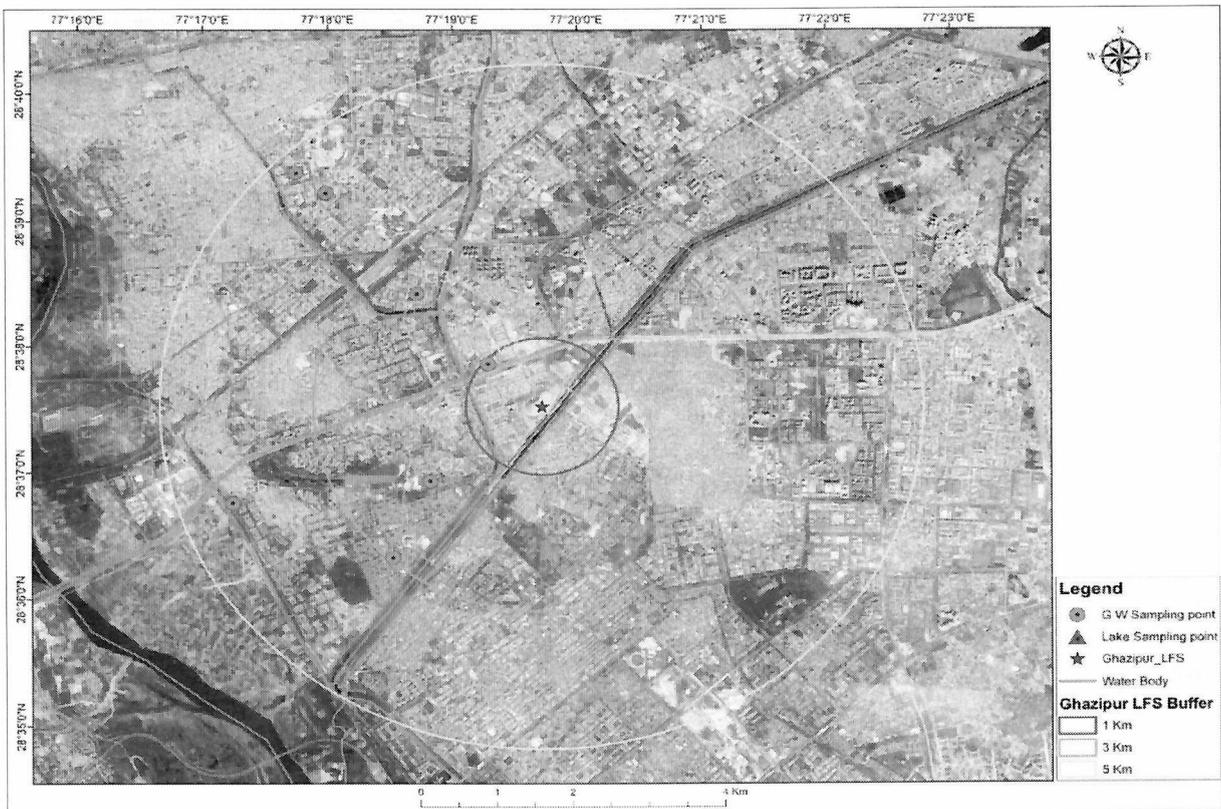
WTP: Water Treatment Plant

**Table 11: WQMS within 5 km of Okhla Dumpsite**

Sr. No.	Object/ Source	Sampling Location (Legend Index)	Latitude	Longitude	Direction & Distance (km) from LFS	Buffer Zone	Station Code
1.	GW	Well at Kalka Ji	28.54985	77.26079	NW & 4.7	3-5 Km	3498
2.	Drain	Sarita Vihar	28.53609	77.29342	NE & 2.8	1-3 Km	1858
3.	Canal	Agra Canal, Madanpur Khadar	28.54637	77.3126	NE & 4.7	3-5 Km	2057
4.	River	River Yamuna at Okhla Barrage D/S	28.53411	77.32767	NE & 5.0	3-5 Km	10009



Fig. 4: Location of WQMS within 5 km of Bhalswa site



**Fig. 5: Location of WQMS within 5 km of Ghazipur site**



**Fig. 6: Location of WQMS within 5 km of Okhla site**

### 3.2.2 Water Quality monitoring data

Water quality monitored data for the above stations has been compiled and ground and surface water quality data is placed at is enclosed at **Annexure IV & V respectively**. In addition, DPCC has monitored Ground Water at all three dumpsites, the same has been compiled and is placed at **Annexure VI**. The details GW Monitoring locations (Dumpsites) were the concentration specific parameters have exceeded the specified limits is given in **Table 12, 13 & 14** respectively. The details of locations where the specified limits have been exceeded as per DPCC data is given in Table 15. Details of surface water location where the specified parameters have been exceeded is given in Table 16. The drinking water standards ( BIS 10500) have been considered for the purpose of assessment of water quality

**Table 12: WQMS within 5 Km of Bhalswa Dumpsite**

Sr. No.	Object/ Source	Sampling Location (Legend Index)	Parameter Exceeding the Permissible Limit		Direction & Distance (km) from LFS
			2018	2019	
1.	GW	Well at Haiderpur (G1)	TDS	TDS, Fluoride	SW & 2.4
2.	GW	Well at Burari (G2)	TDS, Chloride, Iron	TDS, Chloride, COD, Fluoride, Iron	NE & 4.3

**GW** – Ground water from Borewell

**Table 13: WQMS within 5 Km of Ghazipur Dumpsite**

Sr. No.	Object/ Source	Sampling Location (Legend Index)	Parameter Exceeding the Permissible Limit		Direction & Distance (km) from LFS
			2018	2019	
1.	GW	Well at Ghazipur (G1)	TDS, Iron	TDS, Chloride, COD	NW & 0.9
2.	GW	Well at Mayur Vihar (G2)	TDS, Arsenic, COD, Iron	TDS, Iron	SW & 1.4
3.	GW	Well at Patparganj Indl Area (G3)	TDS	TDS	NW & 2.3
4.	GW	Well at Trilokpuri (G4)	TDS, Iron	TDS, Iron	SW & 3.0
5.	GW	Well at Priya Enclave (G5)	TDS	TDS, Iron	NW & 4.2
6.	GW	Well at Patpar Ganj (G6)	TDS, Chloride, Iron	TDS, Chloride, COD, Iron	SW & 4.3
7.	GW	Well at Parivesh Bhawan (G7)	TDS, Chloride, COD	TDS, Chloride, COD	NW & 4.7

**Table 14: WQMS within 5 km of Okhla Dumpsite**

Sr. No.	Object/ Source	Sampling Location (Legend Index)	Parameter Exceeding the Permissible Limit		Direction & Distance (km) from LFS
			2018	2019	
1.	GW	Well at Kalka Ji	TDS, Chromium, Iron	TDS, Iron	NW & 4.7

**Table 15: Parameters Exceeding the Permissible Limits in the Borewell at the Three Dumpsite Sites**

Dumpsite Site	Parameters Exceeding the Permissible Limits	Year
Bhalswa	TDS, Cadmium, Copper, Iron, Chloride	2019 (Iron also in 2017 & 2020)
Ghazipur	TDS, Cadmium, Copper, Chloride	2019
Okhla	TDS, Iron, Chloride	2019

**Table 16: Parameter-wise Exceedance in the Surrounding Areas of Dumpsite Sites**

Sl. No.	Parameters	Site	Station Code	Location	Year
1	Arsenic	Ghazipur	3030	Sanjay Lake	2018 & 2019
		Okhla	2057	Agra Canal, Madanpur Khadar	2018
2	Chloride	Bhalswa	3031	Bhalswa Lake	2018 & 2019
3	Chromium	Bhalswa	1479	Western Yamuna Canal At Haiderpur Water Works	2018
		Okhla	2057	Agra Canal, Madanpur Khadar	2018
		Okhla	1812	Yamuna At Okhla After Meeting Of Shahdara Drain	2018 & 2019
4	COD	All stations except 3045			
5	TDS	Okhla	1812	Yamuna At Okhla After Meeting Of Shahdara Drain	2019
		Okhla	2057	Agra Canal, Madanpur Khadar	2019
		Ghazipur	3030	Sanjay Lake	2018 & 2019
		Bhalswa	3031	Bhalswa Lake	2018 & 2019
6	Turbidity	Ghazipur	3030	Sanjay Lake	2019
		Bhalswa	3031	Bhalswa Lake	2019
7	Iron	Ghazipur	3030	Sanjay Lake	2019

#### 4.0 Damage Assessment

##### 4.1 Water Quality

##### 4.1.1 Water Quality Data Analysis

The information presented in **Table 2** (Leachate analysis) and **Table 12-16** (Ground & Surface Water Analysis) was analysed and the following was observed:

- a) The concentration value of BOD, COD, TDS, TSS, Chloride, Ammonia-n & Cyanide exceeded the stipulated norms in leachate at specified locations
- b) The 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. Chloride and TDS were within the permissible drinking water limits ( BIS 10500) at most stations monitored
- c) Based on (a) &(b) above- further analysis was done in terms of COD & Fe concentration levels
- d) Samples of leachate and groundwater were collected from the three dumpsites and analysed for Fe and COD concentration levels. The results are presented in **Table 17**

**Table 17: Monitoring Results of Fe /COD in Leachate & Ground Water**

Dumpsite	Fe (mg/L)		COD (mg/L)	
	Leachate	Ground Water	Leachate	Ground Water
Bhalswa (Leachate)	10.86	0.28	25895	113
Ghazipur (Leachate)	21.47	1.66	23965	22
Okhla (Leachate)	17.46	3.48	23891	74

- e) Variation in concentration levels of Fe and COD across the 45 Ground Water Monitoring stations monitored by CPCB was assessed and is presented in **Table 18**. The locations at which the concentrations of Fe is exceeding the permissible limits/COD is detected in Ground water is highlighted in red.

**Table 18: Variation in Fe/COD Levels at 45 Ground Water Monitoring Stations in Delhi**

Station Code	Dumpsite	Station Code	Well Station Name	COD (mg/L)	Total Iron (1 mg/L )
<b>A. Borewells within 5 km from the Dumpsite Sites</b>					
1.	Bhalswa	3483	Burari	5	0.87
2.	Ghazipur	3492	Gajipur, Delhi	BDL	0.21
3.	Bhalswa	3494	Haiderpur	BDL	0.07

4.	Okhla	3498	Kalka Ji	BDL	<b>3.34</b>
5.	Ghazipur	3516	Mayur Vihar	BDL	<b>1.82</b>
6.	Ghazipur	3523	Parivesh Bhawan	5	0.15
7.	Ghazipur	3526	Patpar Ganj	BDL	0.32
8.	Ghazipur	3527	Patparganj Indl Area	5	0.58
9.	Ghazipur	3530	Priya Enclave	BDL	0.61
10.	Ghazipur	3543	Trilokpuri	BDL	<b>6.71</b>

**B. Borewells beyond 5 km from the Dumpsite Sites**

1.		3477	Alipur	<b>6</b>	0.06
2.		3479	Aurbindo Marg	BDL	0.2
3.		3480	Bawana	BDL	0.16
4.		3485	Defence Colony	BDL	0.09
5.		3488	Dilshad Garden	<b>7</b>	<b>11.19</b>
6.		3489	Dwarka	<b>5</b>	0.25
7.		3490	Fateh Pur Beri	BDL	0.17
8.		3493	Gandhi Nagar	BDL	0.99
9.		3496	ISBT	BDL	0.06
10.		3500	Kamla Nagar	BDL	<b>5.3</b>
11.		3503	Karol Bagh	BDL	0.1
12.		3514	<b>Matiala</b>	<b>25</b>	0.24
13.		3515	Maya Puri	--	0.09
14.		3517	Najafgarh	<b>6</b>	<b>1.63</b>
15.		3518	<b>Naraina Indl Area</b>	<b>50</b>	<b>1.28</b>
16.		3520	Okhla	BDL	0.37
17.		3524	Paschim Vihar	6	0.98
18.		3525	Patel Nagar	--	<b>1.25</b>
19.		3528	Peeragarhi	--	<b>1.83</b>
20.		3529	Pilanjji	BDL	0.06
21.		3531	Qutab Garh	<b>19</b>	0.15
22.		3532	Rajenaer Nagar	<b>11</b>	0.05
23.		3533	Rajpura Road	BDL	0.42
24.		3534	<b>Near Rakabganj Road</b>	<b>95</b>	<b>2.91</b>
25.		3535	Rohini	BDL	0.07
26.		3536	Saket	BDL	0.23

27.		3537	Shahdara	BDL	0.05
28.		3538	Singhu Border	5	3.39
29.		3539	Singola	BDL	0.24
30.		3540	Sultanpuri	BDL	<b>13.62</b>
31.		3541	Tikri Kalan	<b>5</b>	0.63
32.		3542	Tilak Nagar	BDL	0.86
33.		3544	Ujwah	BDL	0.27
34.		3545	Vasant Kunj	BDL	0.1
35.		3546	Vasant Vihar	<b>15</b>	0.29

**GW** – Ground water from Borewell

#### 4.1.2 Water Quality Trend

- Total No. of Ground Water Monitoring Stations: 45
- No. of Stations falling within a distance of 5 km from dumpsites: 10 stations
- No. of Stations beyond 5 km from dumpsites: 35 stations

Variation of COD & Fe levels in Ground & Surface water locations within 5 km radius of dumpsites is given in Table 19 & 20. Comparison of Fe & COD level within and beyond 5 km radius of dumpsites is given in Table 21

**Table 19: Variation of COD & Fe levels in Ground water within 5 km radius of dumpsites**

Iron Concentration Levels (mg/L)					
Dumpsite	Leachate	Site	0-1 km	1-3 km	3-5 km
Bhalswa (2 Stations)	10.86	0.28	0.07	No	0.87
Ghazipur (7 Stations)	21.47	1.66	0.21	1.82-6.71	0.15-0.61
Okhla (1 Station)	17.46	3.48	-	-	3.34
COD Concentration Levels (mg/L)					
Bhalswa (2 Stations)	25895	113	Nil	-	5 (1 Stn.)
Ghazipur (7 Stations)	23965	22	Nil	Nil	2 Stn.
Okhla (1 Station)	23891	74	-	-	Nil

- : No Station, Stn. : Station

**Table 20 : Water Quality Status: Variation in Surface Water Quality at Different Dumpsite Sites**

Site	Distance	No. of Stations	Fe	COD	TDS	Chloride
Ghazipur	3-5 Km	1	3.44-7.49	73-140	690-806	150-188
Bhalswa	1-3 km	3	0.15-3.91	13-370	72-4386	7-1534
Okhla	3-5 km	3	1.19-12.42	134-866	218- 568	154- 244

**Table 21: Comparison of Fe and COD Levels in Various Sources within 5 km radius of Dumpsite Sites and Other Stations in Delhi**

Sr. No.	Source	Fe Range (mg/L)	COD Range (mg/L)
1.	Leachate	10.86- 21.47	23891-25895
2	Ground water (at LFS)	0.28-3.48	22- 113
3.	Ground water Stations within 5 km radius (10 Stations )	0.32- 6.71 (3 Stations exceeding limits )	5 (COD detected in 3 stations)
4.	Ground water Stations outside 5 km radius (35 Stations)	1.25-13.62 (9 Stations exceeding limits )	5-95 (COD detected in 13 stations)

### 4.1.3 Impact of Dumpsites on Water Quality

- a) 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
- b) 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
- c) 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
- d) 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
- e) 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
- f) 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

## 4.2 Air Quality

### 4.2.1 Assessment of Air Quality within & beyond 5km distance from dumpsites

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. Air quality within and outside 5 km distance was compared to assess the impact of the air pollution sources at the dumpsite. The annual average for all monitored parameters for all 37 CAAQMS for the duration 2018-20 is given at **Annexure VII** . Regional Variation in Air Quality as per distance from the dumpsites is presented in **Table 22**

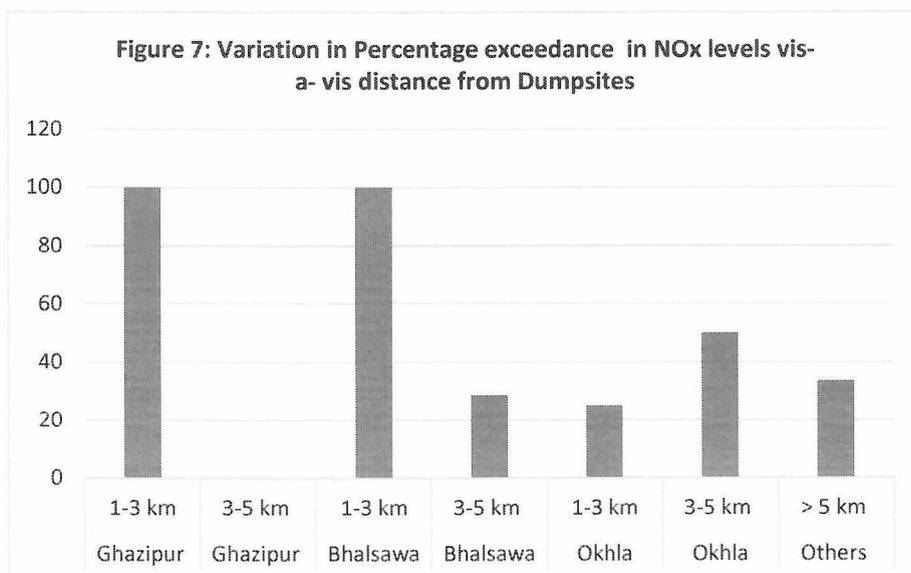
**Table 22: Air Quality Status within 5 km radius of Dumpsite Sites and Beyond**

Dumpsite Site	Distance		PM 10	PM2.5	NOx	Benzene
Ghazipur	1-3 km	Values exceeding stds	3	3	2	0
		Total Monitored Values	3	3	2	2
		Range ( $\mu\text{g}/\text{m}^3$ )	143-341	74-156	44-88	3-4
	3-5 km	Values exceeding stds	3	3	0	0
		Total Monitored Values	3	3	2	1
		Range ( $\mu\text{g}/\text{m}^3$ )	111-216	60-102	14-20	2
Bhalswa	1-3 km	Values exceeding stds	3	3	2	0
		Total Monitored Values	3	3	2	1
		Range ( $\mu\text{g}/\text{m}^3$ )	161-304	79-131	64-65	5
	3-5 km	Values exceeding stds	11	11	2	1
		Total Monitored Values	11	11	7	6
		Range ( $\mu\text{g}/\text{m}^3$ )	157-316	77-137	26-60	1-6
Okhla	1-3 km	Values exceeding stds	6	6	1	0
		Total Monitored Values	6	6	4	4
		Range ( $\mu\text{g}/\text{m}^3$ )	119-252	56-107	28-43	2-3
	3-5 km	Values exceeding stds	3	3	1	0
		Total Monitored Values	3	3	2	
		Range ( $\mu\text{g}/\text{m}^3$ )	146-257	65-130	35-42	
Others	> 5 km	Values exceeding stds	80	80	18	6
		Total Monitored Values	80	80	54	42
		Range ( $\mu\text{g}/\text{m}^3$ )	86-321	51-154	16-70	1-8

#### 4.2.2 Impact of Dumpsites on Air Quality

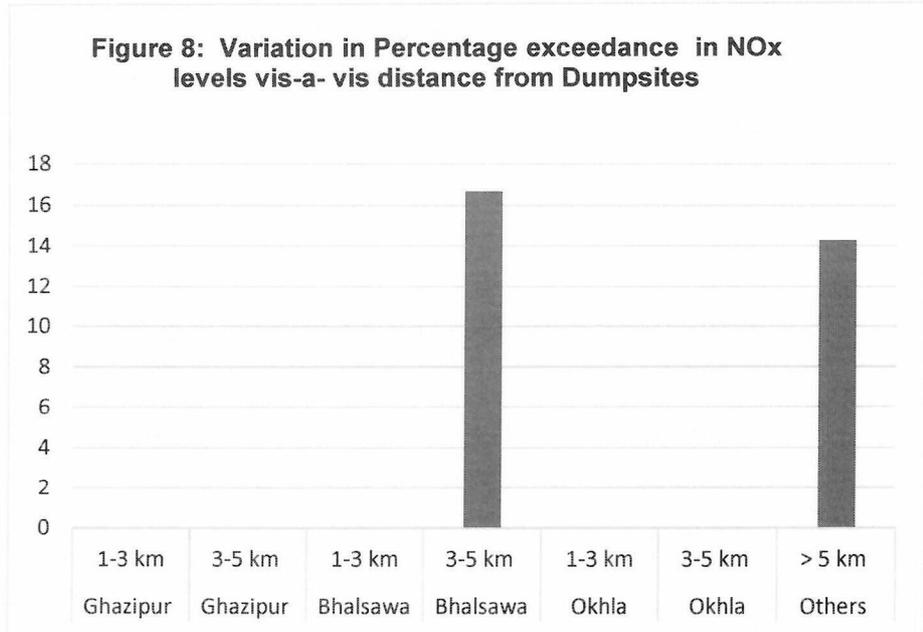
- (i) **PM<sub>2.5</sub>** concentration exceed norms at all stations within and outside 5km distance. Range in variation in PM<sub>2.5</sub> concentration levels within 5 km (56- 156  $\mu\text{g}/\text{m}^3$ ) overlaps the range ( 51-154  $\mu\text{g}/\text{m}^3$ ) observed for stations located at distance greater than 5 km from dumpsites
- (ii) **PM<sub>10</sub>** concentration exceed norms at all stations within and outside 5km distance. Range in variation in PM<sub>10</sub> concentration levels within 5 km (111-341  $\mu\text{g}/\text{m}^3$ ) overlaps the range ( 86-321  $\mu\text{g}/\text{m}^3$ ) observed for stations located at distance greater than 5 km from dumpsites
- (ii) **SO<sub>2</sub> & NH<sub>3</sub>** comply with norms at all stations within and outside 5km distance
- (iii) **NOx**
  - **Range in variation in NOx concentration levels** within 5 km ( 14- 88  $\mu\text{g}/\text{m}^3$ ) overlaps with the range ( 16- 70  $\mu\text{g}/\text{m}^3$ ) observed for stations located at distance greater than 5 km from dumpsites

- Exceedance levels:** Fluctuating trend is observed in NO<sub>x</sub> concentration levels vis-à-vis distance from the dumpsite, percentage exceedance of NO<sub>x</sub> concentration levels decreases with increase in distance from dumpsite ( Ghazipur & Bhalswa) and increase in case of Okhla dumpsite. Percentage exceedance for stations located at distance > 5 km falls within the range of percentage exceedance observed for stations located within 5 km range. Variation in NO<sub>x</sub> levels vis-à-vis distance from dumpsites is presented in **Figure 7**



**(v) Benzene**

- Range in variation in Benzene concentration levels** within 5 km ( 2-5 µgm/m<sup>3</sup>) overlaps with the range ( 1-8 µgm/m<sup>3</sup>) observed for stations located at distance greater than 5 km from dumpsites
- Exceedance percentage:** Fluctuating trend is observed in Benzene exceedance percentage vis-à-vis distance from the dumpsite. Whereas zero exceedance observed at all distance for Okhla & Ghazipur , percentage exceedance of NO<sub>x</sub> concentration levels increases with increase in distance from dumpsite for Bhalswa Percentage exceedance for stations located at distance > 5 km is 15% which is the same as observed at distance 3-5 km from Bhalswa. Variation in Benzene levels vis-à-vis distance from dumpsites is presented in **Figure 5**



(vi) In view of the different air pollution sources enumerated in Section 2.0 above and the observations w.r.t Air quality made in this section and multiple other air pollution sources in the region including road dust, vehicular pollution, C&D activities etc, detailed source apportionment studies shall be required to assess the actual impact of the activities at the dumpsite on the air quality

#### 4.3 Damage Assessment Cost

As discussed in the previous section, deterioration of air and water quality upto 5 km radius and beyond 5 km of each of the three Dumpsite cannot be attributed directly to the various activities at the dumpsites. Further, detailed investigations are required to assess actual impact of the activities on the environment (air, water & soil quality).

Since detailed framework for assessment of quantifiable environment damage liability is yet to be established, interim cost of damage to environment is based on the Environmental Compensation to be levied for violation of Solid Waste Management Rules, 2016.

As per provision of SWM Rules, 2016, waste processing facilities were to be set up by ULBs within 2 years from the date of notification of Rules (7-4-2016), but fresh waste is still being dumped at 3 dumpsites of Delhi.

Assessment of Environmental Compensation cost is based on CPCB's in-house Committee's report in the matter of OA 593/2018, Environment Compensation (EC)

to be levied on concerned ULB for improper solid waste management. It is to be noted that environmental externality cost has been taken into consideration with Environment Compensation assessment. Details are as follows:

$$\text{EC (Lacs Rs.)} = \text{Capital Cost (A)} + \text{O\&M Cost (B)} + \text{Environmental Externality Cost (C)}$$

Where:

$$\text{Capital Cost (Lacs Rs.)} = 2.4 * (\text{Waste Generation in TPD} - \text{Waste Disposed in TPD})$$

$$\text{O \& M Cost (Lacs Rs.)} = 0.02 * (\text{Waste Generation in TPD} - \text{Waste Disposed in TPD}) * N$$

$$\text{Environmental Externality Cost} = \text{Daily Environmental Externality Factor} * N$$

N = Number of days from the date of direction of CPCB/SPCB/PCC till the required capacity systems are provided by the concerned authority.

Details of calculation/various factors applicable in estimation of environmental compensation (EC) is presented in **Table 23**.

**Table 23: Calculation for Environmental Compensation (EC) to be Levied for Improper Management of Municipal Solid Waste**

Sr. No.	Attribute	Value		
		North Delhi	East Delhi	South Delhi
	<b>Responsible Municipal Corporation</b> →	<b>North Delhi</b>	<b>East Delhi</b>	<b>South Delhi</b>
	<b>Dumpsite Site</b> →	<b>Bhalswa</b>	<b>Ghazipur</b>	<b>Okhla</b>
1.	City Class	Mega city	Mega city	Mega city
2.	Waste Generation (TPD)	4013	2700	3500
3.	Waste Disposal as per Rules (TPD)	2013	1250	1700
4.	Waste Management Capacity Gap (TPD)	<b>2000</b>	<b>1450</b>	<b>1800</b>
5.	Calculated EC (capital cost component) in Lacs. Rs.	4800	3480	4320
6.	Minimum and Maximum values of EC (Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 1000 Max. 10000	Min. 1000 Max. 10000	Min. 1000 Max. 10000

<b>7.</b>	<b>Final EC (capital cost component) in Lacs. Rs.</b>	<b>4800</b>	<b>3480</b>	<b>4320</b>
8.	Calculated EC (O&M Component) in Lacs. Rs./Day	40	29	36
9.	Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./Day)	Min. 1 Max. 10	Min. 1 Max. 10	Min. 1 Max. 10
<b>10.</b>	<b>Final EC (O&amp;M Component) in Lacs. Rs./Day</b>	<b>10</b>	<b>10</b>	<b>10</b>
11.	Calculated Environmental Externality (Lacs Rs. Per Day)	0.8	0.58	.72
12.	Minimum and Maximum value of Environmental Externality recommended by the Committee (Rs. Lacs per day)	Min. 0.5 Max. 0.6	Min. 0.5 Max. 0.6	Min. 0.5 Max. 0.6
13.	Final Environmental Externality (Rs. Lacs per day)	<b>0.6</b>	<b>0.58</b>	<b>0.6</b>

#### Non-implementation of SWM Rules 2016

Number of days delayed (from 8.4.2018 to 21.1.2021): N = 1018 days

#### EC for Bhalswa Dumpsite (NDMC):

$$\begin{aligned} \text{EC, Lacs} &= 4800 + 10 \times 1018 + 0.6 \times 1018 \\ &= 4800 + 10180 + 610.8 = 15590.8 \text{ lacs} = \text{Rs. } 155.9 \text{ Cr.} \end{aligned}$$

#### EC for Ghazipur Dumpsite (EDMC):

$$\begin{aligned} \text{EC, Lacs} &= 3480 + 10 \times 1018 + 0.58 \times 1018 \\ &= 3480 + 10180 + 590.44 = 14250.44 \text{ lacs} = \text{Rs. } 142.5 \text{ Cr.} \end{aligned}$$

#### EC for Okhla Dumpsite (SDMC):

$$\begin{aligned} \text{EC, Lacs} &= 4320 + 10 \times 1018 + 0.6 \times 1018 \\ &= 4320 + 10180 + 610.8 = 15110.8 \text{ lacs} = \text{Rs. } 151.1 \text{ Cr.} \end{aligned}$$

## 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.
- vi. 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, PM<sub>10</sub> & PM<sub>2.5</sub> concentrations exceeded the prescribed values at all monitored stations upto 5 km distance & beyond from the Dumpsite sites. SO<sub>2</sub> & NH<sub>3</sub> concentrations are within the prescribed values at all monitored stations. Benzene has exceeded the stipulated limited at one station and NO<sub>x</sub> 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-à-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.

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**CENTRAL POLLUTION CONTROL BOARD, DELHI**

04-12-2020

**Minutes of Meeting in the matter of News item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh Titled "Below mountains of trash lie poison lakes" With Centre for Wildlife and Environment Litigation Vs UOI & Ors. (OA No. 519/2019)**

Fourth meeting of committee, formed in aforesaid matter, was convened through Video Conferencing on December 3, 2020 to deliberate upon the issues related to assessment of the amount of damage to environment on account of dump sites in Delhi. The meeting was attended by following participants:

- Ms Divya Sinha, DH- UPC-II, CPCB
- Dr. S K Goyal, Chief Scientist and Head, NEERI Delhi Zonal Center
- Dr. G V Ramana, Prof., Dept. of Civil Engg., IIT-Delhi
- Mr. P Agarwal, Scientist-E, CPCB
- Mr. Ratnesh Kumar, Scientist-B, CPCB
- Ms. Y. Chandra, Scientist-B, CPCB

Proceedings of the meeting are as given below:

- 1.0 Data of WQM/CAAQM stations of Delhi for year 2018,2019 with coordinates w.r.t. location of dumpsites, Ground Water test reports (2017,2019, 2020) of dumpsites from DPCC and quality of untreated leachate being discharged from dumpsites was discussed but no concrete conclusion regarding attribution to air and water quality by dumpsites could be drawn so far. It was decided that outline of report will be prepared by NEERI and all data will be clubbed with it to reach on conclusion.
- 2.0 Scientist-E, CPCB informed that as fresh waste @5000 TPD is still being dumped at these dumpsites, Environment Compensation to be levied on MCDs for improper SWM has been calculated and forwarded to Committee for consideration.
- 3.0 DH-UPC-II informed that odour from dumpsites may be considered.
- 4.0 Committee opined that as hearing on the matter is on 11-12-2020, extension of one month may be requested from Hon'ble NGT for finalization of report on damage assessment.

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**CENTRAL POLLUTION CONTROL BOARD, DELHI**

02-11-2020

**Minutes of Meeting in the matter of News item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh Titled "Below mountains of trash lie poison lakes" With Centre for Wildlife and Environment Litigation Vs UOI & Ors. (OA No. 519/2019)**

Third meeting of committee, formed in aforesaid matter, was convened through Video Conferencing on October 29, 2020 to deliberate upon the issues related to assessment of the amount of damage to environment on account of dump sites in Delhi. The meeting was attended by following participants:

- Ms Divya Sinha, DH- UPC-II, CPCB
- Dr. S K Goyal, Chief Scientist and Head, NEERI Delhi Zonal Center
- Mr. P Agarwal, Scientist-E, CPCB

Dr. G V Ramana, Prof., Dept. of Civil Engg., IIT-Delhi could not join the meeting as he was suffering from fever.

Proceedings of the Meeting are as given below:

- 1.0 Data of WQM/AQM stations of Delhi for year 2018,2019 with coordinates and dumpsites' Ground water test reports (2017,2019, 2020) of DPCC has been shared by CPCB and NEERI will plot it w.r.t. dumpsites by 02-11-2020.
- 2.0 Dr. S K Goyal, NEERI informed to consider following 3 points
  - Exceedance of parameters for air and water quality to be checked.
  - Other activities near Dumpsites to be considered while assessing damage to environment.
- 3.0 Odour emission (H<sub>2</sub>S, Mercapton, NH<sub>3</sub>) from dumpsites may be considered.
- 4.0 Visit to dumpsites by committee may be undertaken next week.

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**CENTRAL POLLUTION CONTROL BOARD, DELHI**

26-10-2020

**Minutes of Meeting in the matter of News item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh Titled "Below mountains of trash lie poison lakes" With Centre for Wildlife and Environment Litigation Vs UOI & Ors. (OA No. 519/2019)**

Second meeting of committee, formed in aforesaid matter, was convened through Video Conferencing on October 23, 2020 to deliberate upon the issues related to assessment of the amount of damage to environment on account of dump sites in Delhi. The meeting was attended by following participants:

- Ms Divya Sinha, DH- UPC-II, CPCB
- Dr. S K Goyal, Chief Scientist and Head, NEERI Delhi Zonal Center
- Mr. P Agarwal, Scientist-E, CPCB

Dr. G V Ramana, Prof., Dept. of Civil Engg., IIT-Delhi could not join the meeting as he was suffering from fever.

Proceedings of the Meeting are given in the following sections.

- 1.0 Reports submitted by 3 MCDs and data collected so far were perused and discussed.
- 2.0 Dr. S K Goyal ,NEERI informed to consider following 3 points
  - Activities within Dumpsites like trucks movements, bio mining opeartion causing air pollution.
  - Activities outside the dumpsites premises
  - Land use Pattern- what damage has already been done and what is likely to damage.
- 3.0 Committee decided to collect air and ground water quality data within 3 Km of dumpsite on following parameters from CAAQMS and DPCC for comparison  
For Air- PM2.5, PM10, NOX, CO, NH3 and Benzene  
For Ground Water - BOD, TDS, Chloride, Conductivity, Cd, Pb, Fe
- 4.0 Data of WQM/AQM stations with coordinates will be shared by CPCB and NEERI will plot it w.r.t. dumpsites.
- 5.0 Next meeting of committee may be held on Oct 29,2020.

**CENTRAL POLLUTION CONTROL BOARD, DELHI**

**Minutes of Meeting in the matter of News item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh Titled "Below mountains of trash lie poison lakes" With Centre for Wildlife and Environment Litigation Vs UOI & Ors. (OA No. 519/2019)**

A meeting of committee, formed in aforesaid matter, was convened through Video Conferencing on August 11, 2020 to deliberate upon the issues related to assessment of the amount of damage to environment on account of dump sites in Delhi. The meeting was attended by following participants:

- Ms Divya Sinha, DH- UPC-II, CPCB
- Dr. S K Goyal, Chief Scientist and Head, NEERI Delhi Zonal Center
- Dr. G V Ramanna, Prof., Dept. of Civil Engg., IIT-Delhi
- Mr. P Agarwal, Scientist-E, CPCB

Proceedings of the Meeting are given in the following sections.

- 1.0 Committee decided that a holistic view shall be adopted for damage assessment of three dumpsites of Delhi (at Bhalswa, Gazipur and Okhla).
- 2.0 It was decided to collect baseline data on following parameters
  - Air quality in the premises and outside of dumpsite.
  - Ground water quality in the premises and outside of dumpsite.
  - Leachate generation quantity and quality.
  - Quantity and composition of legacy waste as well as of fresh waste.
  - Dust generation due to undergoing biomining and vehicles movement.

A letter along with format, prepared by the committee for collecting information on above points to be sent to concerned municipal corporations of Delhi. Data already available with CPCB shall also be referred to.

- 3.0 Dr. G V Ramanna, Prof. IIT-Delhi, informed that study of IIT and research papers in the matter will be provided for deliberation.
- 4.0 Matter of biomining being carried out at 3 dumpsites of Delhi was also discussed and DH-UPC-II informed that its progress in very slow.
- 5.0 Dr. S K Goyal, NEERI requested for last report filed by CPCB to Hon'ble NGT in the matter.

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As on August 29, 2020

**Questionnaire for Bhalswa Dump Site in Delhi**

(Information required from Municipal Corporations in compliance to NGT Order dt. March 16, 2020 w.r.t. Case No. OA 519/2019)

Sr. No.	Item	Details
<b>A</b>	<b>General Information</b>	
1.	Name and address of Dumpsite Site (DUMPSITE)	SLF Bhalswa
2.	Responsible Municipal Corporation with contact details In-charge	North DMC
3.	Start Month/Year of operation of Dumpsite	1994
4.	Area and Location Coordinates of Dumpsite	Area -70 acres Location Coordinates- 28°44'25.69" N 77°09'38.68" E
5.	Plot plan of DUMPSITE with Elevation Contour	Attachment 1
6.	Location showing DUMPSITE Map with 1 and 3 km surrounding area and drainage pattern	Attachment 2
7.	Population residing within 1 km and 3 km from DUMPSITE	1,97,148 as per census Bhalswa, Jahangir Puri City Population 2011
8.	Details of other activities (industrial, commercial, services etc.), Water bodies within 1 km and 3 km from DUMPSITE	Bhalswa Lake, Sanjay Gandhi Transport Nagar
<b>B</b>	<b>DETAILS OF WASTE DISPOSAL AT DUMPSITE</b>	
9.	Quantity of Legacy Waste (as on March 31, 2015 and 2020)	As on 31/03/2015 approx 43 lakh Cum As on 31/03/2020 approx 78 lakh Cum
10.	Composition of Legacy Waste	Soil Like material {<4mm}34%; textile 7%; wood 3%; plastic 13%; miscellaneous 1%; glass 1%; gravel like material {> 4mm}41%, (as per DPR accepted by IIT Delhi on 08.03.2019)
11.	Quantity of Fresh Waste Disposed (Monthly basis from April-July 2020)(TPM)	About 1,74,600 MT
12.	Average Daily Waste Disposed at	2,300 MT per day

	dumpsite in 2020 ( TPD)	
13	Composition of Fresh Waste with Moisture Content	Soil Like material {<4mm}25%; textile 8%; wood 4%; plastic 18%; miscellaneous 3.50%; glass 1.50%; gravel like material {> 4mm}40%,
14.	No. of Trucks deployed with Capacity	84 No. of Trucks of an average of about 10 MT capacity have been deployed for dumping of fresh waste 36 No. of Trucks for bio-mining purpose 19 No. of Trucks for lifting incinerable waste/ plastic waste/ RDF
15.	No. of daily truck trips	270 to 300 trips for fresh waste, 300 to 350 trips for bio-mining of legacy waste and 30 to 45 trips for lifting of incinerable waste/ plastic waste/ RDF
16.	Duration of truck movement at the Dumpsite	<u>For fresh waste</u> 1) 60 Minutes-90 minutes for Narela Zone 2) 75 Minutes- 105 minutes for Karol Bagh Zone 3) 75 Minutes - 105 minutes for City-Sadar Paharganj Zone 4) 45 Minutes - 75 minutes for Civil Line Zone 5) 45 Minutes – 75 Minutes for Rohini Zone <u>For legacy Waste</u> 25 to 35 minutes for biomining and 45 minutes to 75 minutes for RDF
<b>17.</b>	<b>Treatment of Legacy Waste</b>	
17a	Process adopted, block diagram with Quantity	Attachment 3
17b	Date of initiation of Bioremediation and quantity of waste processed so far (as on July 31, 2020)	01/10/2019 ; 6,10,000 MT
17c	Quantity of waste bio-remediated so far	About 6,93,000 MT
17d	Details of Utilization of various screened fractions of bioremediation including quantity	1) 90,200 MT of inert material dumped at Eco Park site of NTPC and low lying areas 2)1,02,590 MT of RDF lifted & transported to WtE Plant Bawana & Jabalpur 3) 10,876 MT of C&D Waste recovered and has been utilized for covering the pits and making the path pliable for tipper trucks for bio-mining at trommel

		site and dumping of fresh waste
17e	Expected time taken to treat entire Legacy waste	About 2 years
17f	Monthly Expenditure incurred on legacy waste so far from its date of initiation of biomining	3.5 crore per month
17g	Monthly Expenditure expected till completion of Bioremediation	5 to 6 crore per month
<b>18.</b>	<b>Treatment of Fresh Waste</b>	
18a	Process adopted, block diagram with Quantity	About 6,54,193.00 MT (Attachment 4)
18b	Quantity of waste processed (TPD)	NA
18c	Details of Utilization of various processed waste fractions	NA
18d	Monthly Expenditure incurred on processing waste	NA
<b>19.</b>	<b>Air Pollution Related</b>	
19a	No. of fires taken place in Legacy Waste during last 3 years (year-wise details; 2017-18, 2018-19 & 2019-20)	Year 2017: 135 Year 2018: 100 Year 2019: 42 Year 2020: 3
19b	Area of fire, no. of days fire continued, approx. Quantity of waste burnt, efforts made to control fire	Fire erupted at slopes where HEMs could not reach. In each incident, fire was controlled within 24 hours with assistance of fire tenders and by covering the surface with C&D waste
19c	Fugitive Emission due to wind and efforts to control, if any. Details of area covered/capped and open	Bio-remediation of legacy waste is in progress
19d	Estimated quantity of methane generation from Legacy & Fresh waste	As per DPR the total potential gas value was calculated as 1058 M Nm <sup>3</sup> and the gas yield is 3025 Nm <sup>3</sup> /hr
19e	Air quality monitoring by DUMPSITE Operator MC within the premises and nearby area upto 3 km ,( test report to be attached)	Attachment 5
19f	Measures adopted for air pollution control during waste disposal	Sprinkling of water on path ways and smog-gun is being procured for installation at Bhalswa dumpsite
19g	Measures adopted for air pollution control during bioremediation	As above
<b>20</b>	<b>Water Pollution related</b>	As per DPR, the Ground Water of

	(during 2017-18, 2018-19 & 2019-20)	Bhalswa Dumpsite is not discharging into the Bhalswa Lake due to level differences between ground water level at site, typically RL 202m and the water level of Bhalswa Lake being RL 206.340 M
20a	Approx. Quantity of Leachate Generation from Legacy waste and fresh waste (per day basis)	788 cum/day before bio-mining as per DPR
20b	Approx. How much leachate generated in last 3 years at the DUMPSITE	About 7.00 lakh cum
20c	Leachate Collection, Treatment and Disposal Mechanism/Practices	NA
20d	Characteristics of Untreated and Treated Leachate ( test report to be attached)	Report of untreated Leachate is attached (Attachment 6)
20 e	Quality of ground water within DUMPSITE Premises and nearby area upto 3 km ,( test report to be attached)	Report of ground water is attached (Attachment 7)
20f	Measures adopted for water pollution control	NA
	<b>OTHERS</b>	
21	Annual Report summarizing various Activity done at the DUMPSITE	Bio-remediation of legacy waste was undertaken
22	Details of Manpower deployed at the site with designation and officers in charge	02 EE (Civil), 01 EE(E&M), 01 EE(Elect.) 03 AE(Civil), 01 AE(E&M), 01 AE(Elect.) 07 JE(Civil), 01 JE(E&M), 01 JE(Elect.) 101 no of Supervisory Staff, Technical Staff, HEM Operators, DEOs are deployed
23.	Environment Management Practices Adopted by Municipal Corporation (document) with regular Environmental Quality Monitoring program	Sprinkling of water on path ways through water tankers and smog-gun is being procured for installation at Bhalswa dumpsite
24.	Future Plans for MSW Management in Next 5 Years	The tenders for integrated solid waste management for each of the three zones of North DMC i.e., Karol Bagh Zone, City-SP Zone & Narela Zone will invited shortly. Full processing of MSW will be achieved in North DMC after implementation of the same.
25.	Any other relevant information, document, report, maps available	No

September 30, 2020

## Questionnaire for Ghazipur Dump Site in Delhi

(Information required from Municipal Corporations in compliance to NGT Order dt. March 16, 2020 wrt Case No. OA 519/2019)

Sr. No.	Item	Details
<b>A</b>	<b>General Information</b>	
1.	Name and address of Dumpsite Site (DUMPSITE)	SLF Ghazipur Delhi
2.	Responsible Municipal Corporation with contact details In-charge	East Delhi Municipal Corporation, Sh. Sanjay Kumar, Executive Engineer (SLF), Mobile No. 8588899286
3.	Start Month/Year of operation of Dumpsite	1984
4.	Area and Location Coordinates of Dumpsite	70 Acres
5.	Plot plan of DUMPSITE with Elevation Contour	Copy of contour survey enclosed.
6.	Location showing DUMPSITE Map with 1 and 3 km surrounding area and drainage pattern	Copy of part Google maps are attached.
7.	Population residing within 1 km and 3 km from DUMPSITE	2.0 lacs within 1 km and 5.0 lacs within 3 km including part UP Population.
8.	Details of other activities (industrial, commercial, services etc.), Water bodies within 1 km and 3 km from DUMPSITE	Hindon cut Canal is passing from the back side of the dump site within 3 km range commercial and services activity inform of daily colonies, paper market, fish & poultry, flower market, vegetable market, slaughter house, metro yard etc. are in existence now.
<b>B</b>	<b>DETAILS OF WASTE DISPOSAL AT DUMPSITE</b>	
9.	Quantity of Legacy Waste (as on March 31, 2015 and 2020)	14 million tonne.
10.	Composition of Legacy Waste	Garbage, silt, C&D etc.
11.	Quantity of Fresh Waste Disposed (Monthly basis from April-July 2020)(TPM)	2000-2200 MTD
12.	Average Daily Waste Disposed at dumpsite in 2020 ( TPD)	2000-2200 MTD
13.	Composition of Fresh Waste with Moisture Content	30-35%
14.	No. of Trucks deployed with Capacity	No. 100, capacity 8 cum. each
15.	No. Of daily truck trips	550-650 trips
16.	Duration of truck movement at the Dumpsite	24 x 7
17.	<b>Treatment of Legacy Waste</b>	
17a	Process adopted, block diagram with Quantity	Trommeling. Bio-culture sprinkling-Windrows- Bio-culture sprinkling-Turning of

  
 Executive Engineer (SLF)  
 East Delhi Municipal Corporation

		windrows-cartage to trommels-feeding into 30mm screen trommel-0-30 mm size fraction is-6 mm screen trommel. The outputs are -6 mm, 6-30 mm, RDF, C&D. Process flow diagram attached.
17b	Date of initiation of Bioremediation and quantity of waste processed so far (as on July 31, 2020)	23.09.2019 150000 MT
17c	Quantity of waste bioremediated so far	200000 MT
17d	Details of Utilization of various screened fractions of bioremediation including quantity	<6mm - 13500 MT to NTPC eco-park Badarpur & East Delhi Parks, RDF- WtE Plant - 18000 MT, C&D - Road repair at SLF site - 10000 MT
17e	Expected time taken to treat entire Legacy waste	3-5 years subject to utilization of segregated material
17f	Monthly Expenditure incurred on legacy waste so far from its date of initiation of biomining	Rs. 470.00 lac w.e.f. 23.09.2019 Rs. 39.00 lacs per month (Appx.)
17g	Monthly Expenditure expected till completion of Bioremediation	Rs. 350.00 lac (appx.)
18.	<b>Treatment of Fresh Waste</b>	
18a	Process adopted, block diagram with Quantity	Segregation and combustion for WtE.
18b	Quantity of waste processed (TPD)	1300 TPD
18c	Details of Utilization of various processed waste fractions	WtE under PPP
18d	Monthly Expenditure incurred on processing waste	Plant in operation in PPP mode.
19.	<b>Air Pollution Related</b>	
19a	No. Of fires taken place in Legacy Waste during last 3 years (year-wise details; 2017-18, 2018-19 & 2019-20)	2017-18 — 31 2018-19 — 18 2019-20 — 06
19b	Area of fire, no. Of days fire continued, approx. Quantity of waste burnt, efforts made to control fire	All the fire incidents occurred in localized small areas and continued for few hours only.
19c	Fugitive Emission due to wind and efforts to control, if any. Details of area covered/capped and open	Nothing of this sort observed.
19d	Estimated quantity of methane generation from Legacy & Fresh waste	NA
19e	Air quality monitoring by DUMPSITE Operator MC within the premises and nearby area upto 3 km ,( test report to be attached)	Air quality of dump site not applicable.
19f	Measures adopted for air pollution control during waste disposal	Sprinkling of water with the help of tanker on approach roads.
19g	Measures adopted for air pollution control during bioremediation	Sprinkling of water with the help of tanker on approach roads.

  
Executive Engineer (SLF)  
East Delhi Municipal Corporation

20	<b>Water Pollution related</b> (during 2017-18, 2018-19 & 2019-20)	
20a	Approx. Quantity of Leachate Generation from Legacy waste and fresh waste (per day basis)	Not Available being still live site.
20b	Approx. How much leachate generated in last 3 years at the DUMPSITE	Not measured
20c	Leachate Collection, Treatment and Disposal Mechanism/Practices	Re-circulated on fresh garbage.
20d	Characteristics of Untreated and Treated Leachate ,( test report to be attached)	Copy attached.
20 e	Quality of ground water within DUMPSITE Premises and nearby area upto 3 km ,( test report to be attached)	Copy enclosed.
20f	Measures adopted for water pollution control	Leachate collection system with the help of trenches and pipes.
	<b>OTHERS</b>	
21	Annual Report summarizing various Activity done at the DUMPSITE	Segregation with the help of trommels
22	Details of Manpower deployed at the site with designation and officers in charge	01 EE, 01 AE, 03 nos. Junior Engineers with 50 nos. Beldars / Safai Karamcharies / Chowkidars & Computer Operator
23.	Environment Management Practices Adopted by Municipal Cooperation (document) with regular Environmental Quality Monitoring program	Not Applicable
24e.	Future Plans for MSW Management in Next 5 Years	2000 TPD fresh waste integrated processing facility at Ghonda Gujran has been planned and for legacy waste trommeling is to be increased.
25.	Any other relevant information, document, report, maps available	Coordinate of Ghazipur land fill site: 28.624280,77.327378

Please use additional sheet wherever required.

  
Name and signature of information provider

Executive Engineer (SLF)  
East Delhi Municipal Corporation

August 26, 2020

**Questionnaire for Okhla Dump Site in Delhi**

(Information required from Municipal Corporations in compliance to NGT Order dt. March 16, 2020 w.r.t. Case No. OA 519/2019)

S. No	Item	Details
<b>A</b>	<b>General Information</b>	
1.	Name and address of Dumpsite (DUMPSITE)	SLF, Okhla at Maa Anand Mai Marg, Okhla Phase-I, SDMC
2.	Responsible Municipal Corporation with contact details In-charge	South Delhi Municipal Corporation Executive Engineer (SLF) Okhla Room no. 6, gate no. 4, Dr. Ambedker stadium, Delhi gate, New Delhi-110002 Ph No. 011-23329185
3	Start Month/Year of operation of Dumpsite	1996
4	Area and Location Coordinates of Dumpsite	Area: Approx. 46.2 acres Latitude: 28.5122092 Longitude: 77.2833342
5	Plot plan of DUMPSITE with Elevation Contour	Plot plan and elevation contour of DUMPSITE is enclosed as annexure "A".
6	Location showing DUMPSITE Map with 1 and 3 km surrounding area and drainage pattern	Location Plan is enclosed as annexure "B".
7	Population residing within 1 km and 3 km from DUMPSITE	No residential colony in the vicinity.
8	Details of other activities (industrial, commercial, services etc.), Water bodies within 1 km and 3 km from DUMPSITE	The details of other activities are marked on annexure "C". No water body in vicinity.
<b>B</b>	<b>DETAILS OF WASTE DISPOSAL AT DUMPSITE</b>	
9	Quantity of Legacy Waste (as on March 31, 2015 and 2020)	i. Quantity of Legacy Waste as on March 31, 2015, 40 lac MT ii. Quantity of Legacy Waste as on March 2020, 60 lac MT
10	Composition of Legacy waste	Enclosed as annexure "D".
11	Quantity of Fresh Waste Disposed (Monthly basis from April-July 2020) (TPM)	Quantity of Fresh Waste Disposed as on:- i. April 2020 - 42986 ii. May 2020 - 55541 iii. June 2020 - 59352 iv. July 2020 - 65542
12	Average Daily Waste Disposed at dumpsite in 2020 (TPD)	1800
13	Composition of Fresh Waste with Moisture Content	Composition of Fresh Waste is enclosed as annexure "E".
14	No. of Trucks deployed with Capacity	200 trucks ( 4 MT to 12 MT capacity)
15	No. of Daily truck trips	300 trips

16	Duration of truck movement at the dumpsite	Round the clock
<b>17</b>	<b>Treatment of legacy waste</b>	
17a	Process adopted, block diagram with Quantity	Enclosed as annexure "F".
17b	Date of initiation of Bio-remediation and quantity of waste processed so far (as on July 31, 2020)	8-10-2019 [Start of first trommel machine]
17c	Quantity of waste bio-remediated so far	1.40 Lakh MT upto 12.9.2020
17d	Details of Utilization of various screened fractions of bio-remediation including quantity	<p>i. RDF is being sent to Waste to Energy Plant, Okhla.</p> <p>ii. Screened fraction (inert) of &gt;30mm are being sent to SLF, Tajpur/Jaitpur.</p> <p>iii. Screened fraction of &lt;6mm are being sent to Eco Park, NTPC.</p> <p>iv. Inerts &amp; C&amp;D waste are also being used to cover dumped waste daily at SLF, Okhla.</p>
17e	Expected time taken to treat entire Legacy waste	3 years approximately
17f	Monthly Expenditure incurred on legacy waste so far from its date of initiation of bio-mining	Total expenditure from October 2019 to August 2020 is Rs. 2.5 Crore. Monthly average is Rs. 22.7 lakh as of now. However, it is likely to increase substantially in future depending on number of trommels and disposal cost of by-products.
17g	Monthly Expenditure expected till completion of Bio-remediation	The monthly expenditure expected may be about 3.00 crores per month, assuming increase in no. of trommels installed and machinery deployed for the same. However, this does not include the cost of transportation/disposal of the RDF/inerts/soil.
<b>18</b>	<b>Treatment of Fresh waste</b>	
18a	Process adopted, block diagram with Quantity	Enclosed as annexure "G".
18b	Quantity of waste processed (TPD)	1800 TPD approximately
18c	Details of Utilization of various processed waste fractions	<p>i. Compost Plant Okhla for making compost and selling of compost.</p> <p>ii. Waste to Energy Plant Okhla for incineration and make electricity for sale.</p> <p>iii. 1 TPD aerobic drum composter (3 nos.)</p> <p>iv. 5 TPD bio-methanation plant (3 nos.)</p>

18d	Monthly Expenditure incurred on processing waste	Approx Rs. 40 lakh per month expenditure incurred on salary/fuel/machineries etc. engaged for management of processing waste.
<b>19</b>	<b>Air Pollution Related</b>	
19a	No. of fires taken place in Legacy waste during last 3 years (year wise details; 2017-18, 2018-19 & 2019-20)	No
19b	Area of fire, no. of days fire continued approx. Quantity of waste burnt, efforts made to control fire	NA
19c	Fugitive Emission due to wind and efforts to control, if any. Details of area covered/capped and open	Following efforts are been made to control emission due to wind:- i. Spraying of Water on approaches by deploying water tanker with sprinkling arrangement. ii. Anti smog gun is being procured shortly. iii. Greenery has been provided on front side.
19d	Estimated quantity of methane generation from legacy & Fresh waste	Generally no methane gas generation from legacy waste is observed. No estimation available for methane generation from fresh waste at SLF, Okhla.
19e	Air quality monitoring by DUMPSITE operator MC within the premises and nearby area upto 3 km (test report to be attached)	No. It is to be done by Delhi Pollution Control Board.
19f	Measures adopted for air pollution control during waste disposal	Following efforts are been made to control air pollution:- i. Spraying of Water on approaches by deploying water tanker with sprinkling arrangement. ii. Anti smog gun is being procured shortly. iii. Greenery has been provided on front side.
19g	Measures adopted for air pollution control during bio-remediation	Following efforts are been made to control air pollution:- i. Spraying of Water around trammel machine by water tanker with sprinkling arrangement. ii. Anti smog gun are under process of procurement.
<b>20</b>	<b>Water Pollution related (during 2017-18, 2018-19 &amp; 2019-20)</b>	
20a	Approx. Quantity of Leachate Generation from Legacy waste and fresh waste (per day basis)	This site was setup before solid Waste Management Rules 2016. No arrangement was made for collection of leachate.

20b	Approx. How much leachate generated in last 3 years at the DUMPSITE	Same as above S. No. 20 (a)
20c	Leachate Collection, Treatment and Disposal Mechanism/Practices	<p>Leachate is re-circulated on windrows as per the schedule-II (A) (g) of MSW Rules 2016. Enclosed herewith as annexure 'H'.</p> <p>Land allotted for development of new Engineered landfill at Tehkhand, which is adjacent to the existing SLF, Okhla. The provision of Leachate Treatment Plant (LTP) has been taken in the project for development of new Engineered landfill which will also cater to the leachate being generated at SLF, Okhla.</p>
20d	Characteristics of Untreated and Treated Leachate, (test report to be attached)	No test for leachate has been conducted.
20e	Quality of ground water within DUMPSITE Premises and nearby area up to 3 km, (test report to be attached)	Ground water testing report is enclosed herewith as annexure 'I'.
20f	Measures adopted for water pollution control	Same as above S. No. 20 (a)
	<b>Other</b>	
21	Annual Report summarizing various Activity done at the DUMPSITE	Annual report on implementation of Solid Waste Management Rules 2016 is enclosed herewith as annexure 'J'.
22	Details of Manpower deployed at the site with designation and officers in charge	Enclosed herewith as annexure 'K'.
23	Environment Management Practices Adopted by Municipal Corporation (document) with regular Environmental Quality Monitoring program	Action plan is enclosed as Annexure "L"
24	Future Plans for MSW Management in Next 5 Years	Enclosed herewith as annexure 'M'.
25	Any other relevant information, document, report, maps available.	

  
Sanjay Hingorani

Assistant Engineer (SLF)

AIR QUALITY MONITORING DATA FOR THREE DUMPSITES IN DELHI ( Bhalsawa, Ghazipur & Okhla)															ANNEXURE III	
Site	CAAQMS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Parameter	Ann.Avg (µg/m3)
BSW	Burari Crossing													2020	Benzene	
BSW	Burari Crossing													2019	Benzene	
BSW	Burari Crossing													2020	NH3	
BSW	Burari Crossing													2019	NH3	
BSW	Burari Crossing													2020	NO2	
BSW	Burari Crossing	29	12.1	31.8	85.7	70	47.9	42.8	36.1	36.2	10.6	15.6	21.1	2019	NO2	37
BSW	Burari Crossing													2020	PM10	
BSW	Burari Crossing	301	190	148	166	207	169	108	68	72	201	260	259	2019	PM10	179
BSW	Burari Crossing	211	149	163					94	126	248	338	405	2018	PM10	217
BSW	Burari Crossing													2020	PM2.5	
BSW	Burari Crossing	182	108	80	88	91	61	46	42		139	188	182	2019	PM2.5	110
BSW	Burari Crossing	132	93	101	107	80			42	52	139	238	279	2018	PM2.5	126
BSW	Burari Crossing													2020	SO2	
BSW	Burari Crossing													2019	SO2	
BSW	DTU	7.4	5.9	3	2.1	2.8	2.4	1.5	1.5	2.8				2020	Benzene	3
BSW	DTU	12.1	5.7	4.3	4.7	4.6	4.6	8.8	3.2	3.3	4.8	6	8.3	2019	Benzene	6
BSW	DTU	22.3	12.8	20.6	14.2	9.4	14.5	6.5	6.7	28				2020	NH3	15
BSW	DTU	21.8	23	25.5	26	27.4	22.1	34.6	37.1	68.7	40.6	27.9	30.9	2019	NH3	32
BSW	DTU	40.5	35.9	24.6	20.7	21.2	23.3	18.4	18.4	27.9				2020	NO2	26
BSW	DTU	81.7	54.8	40	31.4	28.2	33.1	43.5	41.8	63.3	39.5	48.3	73.6	2019	NO2	48
BSW	DTU	270	278	163	126	174	150	97	72	181				2020	PM10	168
BSW	DTU	340	203	195	266	289	219	147	94	107	280	319	319	2019	PM10	232
BSW	DTU				300	136	199	99	126	115	332	403	417	2018	PM10	236
BSW	DTU	172	153	76	52	64	51	36	28	62				2020	PM2.5	77
BSW	DTU	211	118	92	90	106	64	56	45	49	142	226	230	2019	PM2.5	119
BSW	DTU	280	115	96	95	84	73	37	37	40	144	224	251	2018	PM2.5	123
BSW	DTU	4.9	6.2	7.4	12.6	15	11.3	7.5	14.8	6.1				2020	SO2	10
BSW	DTU	18.5	12.2	11.6	20.1	25.4	8.1	10	2.8	4.7	9.6	10.6	6.3	2019	SO2	12
BSW	Jahangirpuri													2020	Benzene	
BSW	Jahangirpuri	8.2	5.7	4.6	5.3	5.2	2.1	0.9	1.7	4.5	14.6	*	*	2019	Benzene	5
BSW	Jahangirpuri	81.4	105.9	67.8	75.7	52.4	26	27.4	28.4	28.1				2020	NH3	55
BSW	Jahangirpuri	69.1	54	44.7	46.8	45.4	23.9	40.5	45.4	40.8	55.7	57.9	76.9	2019	NH3	50
BSW	Jahangirpuri	164.4	137.7	73.9	69.4	37	24.7	21.6	20.5	30				2020	NO2	64
BSW	Jahangirpuri	80.4	58.1	50.4	52.7	52.9	43.5	32.8	32.2	34.8	73.2	91.4	173.7	2019	NO2	65
BSW	Jahangirpuri	302	268	148	128	169	136	85	66	144				2020	PM10	161
BSW	Jahangirpuri	395	267	232	271	284	214	139	98	102	290	350	391	2019	PM10	253

Site	CAAQMS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Parameter	Ann.Avg (µg/m3)
BSW	Jahangirpuri		395	319	325	307	295	124	140	148	364	426	499	2018	PM10	304
BSW	Jahangirpuri	205	149	65	54	64	50	39	27	62				2020	PM2.5	79
BSW	Jahangirpuri	247	146	107	111	101	74	56	41	42	149	210	262	2019	PM2.5	129
BSW	Jahangirpuri		119	89	116	112	103	43	45	62	186	256	313	2018	PM2.5	131
BSW	Jahangirpuri	9.1	7.9	3	1.1	5.7	5	2.6	3.3	8.1				2020	SO2	5
BSW	Jahangirpuri	21.6	17.9	24.7	28.4	27.7	22.1	13.8	13.2	16.9	18.1	14.9	8.4	2019	SO2	19
BSW	Rohini	2.3	1.9	1.7	1.7	1.6	1.6	1.5	1.3	1.6				2020	Benzene	2
BSW	Rohini	4.9		2.4	4.7	5.7	0.6	2			1.9	1.7	2.3	2019	Benzene	3
BSW	Rohini	55.6	50.3	40.3	39.3	54.9	115.3	50.7	42.6	52.7				2020	NH3	56
BSW	Rohini	54.4	44.5	31.6	39.4	41.6	60.4	55.4	56.2	22.7	31	36.6	114.8	2019	NH3	49
BSW	Rohini	23.8	27.5	20	10.1	14.6	22.9	15.8	17.3	19				2020	NO2	19
BSW	Rohini	63.6	49.7	44.8	50.7	52.4	19.6	16.3	17.4	12.1	26	27.7	25.4	2019	NO2	34
BSW	Rohini	267	257	138	138	161	144	95	71	138				2020	PM10	157
BSW	Rohini	379	238	200	269	267	213	147	92	98	285	341	359	2019	PM10	241
BSW	Rohini		357	312	349	318	274	104	131	127	387	397	466	2018	PM10	293
BSW	Rohini	191	164	73	62	68	52	36	30	56				2020	PM2.5	81
BSW	Rohini	248	144	100	94	109	66	46	41	49	148	238	261	2019	PM2.5	129
BSW	Rohini		152	102	101	91	77	44	46	54	188	246	300	2018	PM2.5	127
BSW	Rohini	5.2	10.1	10.6	11.9	9.9	7.8	3	2.2	4.4				2020	SO2	7
BSW	Rohini	22.4	19.9	23.9	27.1	25.3	7.4	3.3	3.6	4.3	6	5.5	3.8	2019	SO2	13
BSW	Wazirpur	0.8	5.1	4.4	2.6	2.8	2.3	2.5	2.7	2.3				2020	Benzene	3
BSW	Wazirpur	6.2	5.5	4.3	5.9	6.4	4	1.7	4.5	4.3	5.7	0.8	0.9	2019	Benzene	4
BSW	Wazirpur	47.6	42.6	38.3	28	30.6	36.3	39.3	32.6	33.8				2020	NH3	37
BSW	Wazirpur	80.2	55.2	33.1	37.1	35.6	40.7	30.6	47.6	40.7	34.7	45.7	53.4	2019	NH3	45
BSW	Wazirpur	25	59.7	43.9	33.3	32.1	31.5	28.9	29.1	37.8				2020	NO2	36
BSW	Wazirpur	70.8	79.2	71.5	81.7	88.8	67.5	45.4	43.1	39.5	48.6	44.4	41.9	2019	NO2	60
BSW	Wazirpur	300	271	178	108	135	124	86	80	156				2020	PM10	160
BSW	Wazirpur	407	300	231	307	317	266	206	146	172	316	380	403	2019	PM10	288
BSW	Wazirpur		374	295	372	322	294	154	141	168	396	472	492	2018	PM10	316
BSW	Wazirpur	198	146	75	52	59	49	39	29	40				2020	PM2.5	76
BSW	Wazirpur	262	168	100	102	110	66	54	44	60	155	243	263	2019	PM2.5	136
BSW	Wazirpur		166	122	88	102	101	49	50	60	175	274	316	2018	PM2.5	137
BSW	Wazirpur	10	9.1	13.9	13.1	17.6	21.6	17.5	20.2	19.8				2020	SO2	16
BSW	Wazirpur	21.2	18.3	19.9	23.3	24.5	17.8	11	9.2	10.6	15.6	14.4	10.2	2019	SO2	16
GZP	And Vihar	180	124	62	47	68	66	39	29	47				2020	PM2.5	74
GZP	Patparganj	146	108	51	37	46	44	28	22	54				2020	PM2.5	60
GZP	And Vihar	303	266	145	104	113	107	69	54	127				2020	PM10	143

Site	CAAQMS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Parameter	Ann.Avg (µg/m3)
GZP	Patparganj	229	187	113	82	113	84	53	43	99				2020	PM10	111
GZP	And Vihar	9.6	7.9	9.8	14.4	14.9	15.3	11	10.3	22.8				2020	SO2	13
GZP	Patparganj	3.4	5.6	6.7	7.3	8.1	5.4	3.8		7.8				2020	SO2	6
GZP	And Vihar	61.7	69.1	40.8	19.2	28.8	34.7	31.4	51.1	56				2020	NO2	44
GZP	Patparganj	21.3	24.5	14.3	13.5	9.7	8.7	9.6	10.3	14.7				2020	NO2	14
GZP	And Vihar	40.9	36.8	25.6	46.5	29.9	30.6	25.5	37	26				2020	NH3	33
GZP	Patparganj	75.9	50.4	42.9	47.1	47.4	51.4	43.5	41	43.4				2020	NH3	49
GZP	And Vihar	3.8	3.2	3	2.5	2.7	3.6	2.6	2	1.3				2020	Benzene	3
GZP	Patparganj	1.2	0.9	0.6	0.3	0.2	0.2	0.2	0.2	0.3				2020	Benzene	0
GZP	And Vihar	233	140	99	99	111	73	55	43	43	162	238	254	2019	PM2.5	129
GZP	Patparganj	192	113	71	68	72	61	50	28	34	118	188	202	2019	PM2.5	100
GZP	And Vihar	375	279	258	300	291	261	190	125	119	333	384	385	2019	PM10	275
GZP	Patparganj	298	192	140	212	220	189	111	61	86	213	291	296	2019	PM10	192
GZP	And Vihar	11.2	16.8	19	27.3	20.6	11.6	7.8	7.5	7.6	11.2	12.3	8.4	2019	SO2	13
GZP	Patparganj	4.7	3.5	5.5	7.7	6.2	4.8	2.6	2.2	2.4	4	3.5	1.7	2019	SO2	4
GZP	And Vihar	107	93.1	81.8	92.7	102.1	83	52.1	54.6	45.7	93.5	99.2	147.3	2019	NO2	88
GZP	Patparganj	29.3	23.5	19.4	21.9	29.7	18.9	10.1	9.5	11.2	18	27.4	24.2	2019	NO2	20
GZP	And Vihar	67.6	41.3	38.3	48	49.5	45.7	38.6	53.9	28.9	66.4	75.9	99.5	2019	NH3	54
GZP	Patparganj	72.1	56.6	54.9	60.2	56.5	51.6	53.6	45.8	28.3	43.7	36.4	32.2	2019	NH3	49
GZP	And Vihar	11.3	6.8	4.1	5.2	5	2.9	1.3	2.5	2.7	3.1	2.3	4.5	2019	Benzene	4
GZP	Patparganj	0.7	0.5	0.9	3	4.3	3.2	4.4	3.8	0.4	1.3	1.7	1.6	2019	Benzene	2
GZP	And Vihar	271	161	122	116	107	111		48	58	175	252	300	2018	PM2.5	156
GZP	Patparganj		142	93	74	79	58	34	34	39	136	198	236	2018	PM2.5	102
GZP	And Vihar	477	419	354	331	160	259		148	205	440	472	486	2018	PM10	341
GZP	Patparganj		271	209	233	174	227	103	123	111	272	305	347	2018	PM10	216
OKH	CRRJ Mathura Road	155	118	53	44	53	47	36	25	55				2020	PM2.5	65
OKH	Dr. Karni Singh Shoc	153	111	50	32	34	38	25	19	38				2020	PM2.5	56
OKH	Okhla Phase-2	169	125	54	43	45	44	29	20	45				2020	PM2.5	64
OKH	CRRJ Mathura Road	272	245	124	107	142	135	85	58	149				2020	PM10	146
OKH	Dr. Karni Singh Shoc	225	195	106	95	124	110	63	43	110				2020	PM10	119
OKH	Okhla Phase-2	259	230	124	98	129	137	81	56	130				2020	PM10	138
OKH	CRRJ Mathura Road													2020	SO2	
OKH	Dr. Karni Singh Shoc	13.7	17.5	14.5	15.4	16.1	8.9	4.2	4.6	7.1				2020	SO2	11
OKH	Okhla Phase-2	15.2	16.3	15.6	16.8	14.3	15.1	10	7.8	11.3				2020	SO2	14
OKH	CRRJ Mathura Road	80.6	75.7	27.3	16.7	16.2	15.3	18.9	21.4	44.9				2020	NO2	35
OKH	Dr. Karni Singh Shoc	44.2	42.2	33	11	13.3	18.7	19.3	18.7	53.5				2020	NO2	28
OKH	Okhla Phase-2	48.3	47.9	29.5	15.5	23.9	25.7	24.2	22.7	33.4				2020	NO2	30

Site	CAAQMS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Parameter	Ann.Avg (µg/m3)
OKH	CRRJ Mathura Road													2020	NH3	
OKH	Dr. Karni Singh Shod	21.4	20.3	25.5	30	36.7	25.2	20.4	14.5	17.3				2020	NH3	23
OKH	Okhla Phase-2	42.6	35.5	31	24.2	25.4	67.9	43.5	19.8	20.3				2020	NH3	34
OKH	CRRJ Mathura Road													2020	Benzene	
OKH	Dr. Karni Singh Shod	5.5	3.6	1.9	1.5	1.4	1.5	0.9	0.7	1.8				2020	Benzene	2
OKH	Okhla Phase-2	6	3.5	1.6	1.3	1.3	1.6	1.3	1.3	2.3				2020	Benzene	2
OKH	CRRJ Mathura Road	206	106	81	83	73	60	49	34	37	125	196	192	2019	PM10	104
OKH	Dr. Karni Singh Shod	180	108	69	66	66	50	36	23	32	116	198	223	2019	PM10	97
OKH	Okhla Phase-2	214	113	80	73	73	51	42	30	36	127	205	238	2019	PM10	107
OKH	CRRJ Mathura Road	293	173	161	227	286	234	136	77	80	254	321	318	2019	PM2.5	213
OKH	Dr. Karni Singh Shod	280	190	164	213	218	191	116	59	72	220	291	321	2019	PM2.5	195
OKH	Okhla Phase-2	337	245	171	197	205	202	147	80	94	252	324	343	2019	PM2.5	216
OKH	CRRJ Mathura Road													2019	SO2	
OKH	Dr. Karni Singh Shod	19.3	17.6	20.5	24.8	18.5	12.5	7.6	5.7	6.9	10.6	16.9	14	2019	SO2	15
OKH	Okhla Phase-2	11.9	11	13.3	16.7	14.6	13.6	10	8.3	9.6	13.5	15.7	12.8	2019	SO2	13
OKH	CRRJ Mathura Road	38.8	28.4	31.2	26.4	50.9	31.9	18.1	31.1	32.8	140.1	123.5	72.3	2019	NO2	52
OKH	Dr. Karni Singh Shod	51	39.5	41.9	45.4	45.4	29.2	23.5	22.8	19.9	55.5	64.8	76	2019	NO2	43
OKH	Okhla Phase-2	52.8	39.3	43.8	43.7	48	32.2	24.7	22.1	18.9	43	58.6	47.3	2019	NO2	40
OKH	CRRJ Mathura Road													2019	NH3	
OKH	Dr. Karni Singh Shod	31	32.4	27.7	25.5	21.8	26.2	24.8	38.5	84.8	21.9	14.9	18.7	2019	NH3	31
OKH	Okhla Phase-2	62.2	44.3	33.1	23.6	29.1	27.5	25.3	21.8	26.3	34.9	34.2	43.2	2019	NH3	34
OKH	CRRJ Mathura Road													2019	Benzene	
OKH	Dr. Karni Singh Shod	5.7	3.2	3.4	3.5	3.2	2.2	0.8	1.1	1.4	5	6.3	7.2	2019	Benzene	4
OKH	Okhla Phase-2	6.4	4	3.8	3.8	3.7	3.9	3.4	3.4	3	6.8	7.1	7.2	2019	Benzene	5
OKH	CRRJ Mathura Road	182	170	118	132	90	72	40	39	45	205	209	257	2018	PM2.5	130
OKH	Dr. Karni Singh Shooting Ra	146	92	44	43	38	36	30	37	112	161	186		2018	PM2.5	84
OKH	Okhla Phase-2		145	107	82	82	67	33	35	46	133	210	227	2018	PM2.5	106
OKH	CRRJ Mathura Road	342	264	214	231	257	250	117	139	137	335	324	470	2018	PM10	257
OKH	Dr. Karni Singh Shooting Ra	268	189	163	184	176	83	107	131	286	289	312		2018	PM10	199
OKH	Okhla Phase-2		290	250	271	268	279	104	123	121	305	353	404	2018	PM10	252

WATER QUALITY MONITORING DATA AS PER WQMS LOCATED WITHIN ZONE OF INFLUENCE											
DUMPSITE	Station Code	Year	Station Name	Arsenic (mg/L)(1)	Cadmium(2)	Chlorides (mg/L)(3)	Chromium Total (4)	COD (mg/L)(5)	Copper (6)	Cyanide (7)	Total Dissolved Solids (mg/L)(8)
				ND	0.01	250	0.05		0.05	ND	500
BHALSAWA	3483	2018	WELL AT BURARI, DELHI	BDL	BDL	265	BDL	BDL	BDL		1366
BHALSAWA	3483	2019	WELL AT BURARI, DELHI	BDL	BDL	277	BDL	5	BDL		1158
BHALSAWA	3494	2018	WELL AT HAIDERPUR, DELHI	BDL	BDL	40	BDL	BDL	BDL		522
BHALSAWA	3494	2019	WELL AT HAIDERPUR, DELHI	BDL	BDL	45	BDL	BDL	BDL		564
GHAZIPUR	3492	2018	WELL AT GAJIPUR, DELHI	BDL	BDL		BDL	20	0.01		4130
GHAZIPUR	3492	2019	WELL AT GAJIPUR, DELHI	BDL	BDL	427	BDL	BDL	BDL		1562
GHAZIPUR	3516	2018	WELL AT MAYUR VIHAR, DELHI	BDL	BDL		BDL	10	BDL		1130
GHAZIPUR	3516	2019	WELL AT MAYUR VIHAR, DELHI	0.02	BDL	177	BDL	BDL	BDL		1072
GHAZIPUR	3523	2018	WELL AT PARIVESH BHAWAN, DELHI	BDL	BDL	532	BDL	7	BDL		1820
GHAZIPUR	3523	2019	WELL AT PARIVESH BHAWAN, DELHI	BDL	BDL	537	BDL	5	BDL		1752
GHAZIPUR	3526	2018	WELL AT PATPAR GANJ, DELHI	BDL	BDL		BDL	BDL	0.02		738
GHAZIPUR	3526	2019	WELL AT PATPAR GANJ, DELHI	BDL	BDL	1982	BDL	BDL	BDL		4864
GHAZIPUR	3527	2019	WELL AT PATPARGANJ INDL AREA, DELHI	BDL	BDL	714	BDL	5	BDL		2200
GHAZIPUR	3530	2019	WELL AT PRIYA ENCLAVE, DELHI	BDL	BDL	189	BDL	BDL	BDL		1108
GHAZIPUR	3543	2018	WELL AT TRILOKPURI, DELHI	BDL	BDL		0.02	BDL	BDL		876
GHAZIPUR	3543	2019	WELL AT TRILOKPURI, DELHI	BDL	BDL	243	BDL	BDL	BDL		1154
OKHLA	3498	2018	WELL AT KALKA JI, DELHI	BDL	BDL	58	0.11	5	BDL		628
OKHLA	3498	2019		BDL	BDL	93	BDL	BDL	BDL		674

WATER QUALITY MONITORING DATA AS PER WQMS LOCATED WITHIN ZONE OF INFLUENCE														ANNEXURE IV	
DUMPSITE	Station Code	Year	Station Name	Flouride (mg/L)(9)	Lead (10)	Mercury(11)	NH3-N (12)	Nickel (13)	pH(14)	Phenolic compounds (15)	Turbidity (16)	Zinc(17)	Iron Total (18)	Total Fixed Solids (mg/L)(19)	
				1	0.05	ND		-	6.5-8.5	0.001	5	5	0.3		
BHALSAWA	3483	2018	WELL AT BURARI, DELHI	3.3	BDL	BDL		BDL	7.6			BDL	BDL	BDL	
BHALSAWA	3483	2019	WELL AT BURARI, DELHI	3.1	BDL	BDL		BDL	7.2			0.02	0.87		
BHALSAWA	3494	2018	WELL AT HAIDERPUR, DELHI	2.7	BDL	BDL		BDL	7.7			0.09	0.51	24	
BHALSAWA	3494	2019	WELL AT HAIDERPUR, DELHI	2.1	BDL	BDL		BDL	7.6			0.07	0.07		
GHAZIPUR	3492	2018	WELL AT GAJIPUR, DELHI	0.8	BDL	BDL		BDL				0.41	5.04	25	
GHAZIPUR	3492	2019	WELL AT GAJIPUR, DELHI	0.6	BDL	BDL		BDL	7			BDL	0.21	1216	
GHAZIPUR	3516	2018	WELL AT MAYUR VIHAR, DELHI	0.4	BDL	BDL		BDL				0.99	2.69	45	
GHAZIPUR	3516	2019	WELL AT MAYUR VIHAR, DELHI	0.6	BDL	BDL		BDL	7.3			BDL	1.82		
GHAZIPUR	3523	2018	WELL AT PARIVESH BHAWAN, DELHI	0.5	BDL	BDL		BDL	7.9			0.02	0.16	8	
GHAZIPUR	3523	2019	WELL AT PARIVESH BHAWAN, DELHI	0.4	BDL	BDL		BDL	6.9			0.01	0.15	1562	
GHAZIPUR	3526	2018	WELL AT PATPAR GANJ, DELHI	0.7	BDL	BDL		BDL				0.05	2.27	27	
GHAZIPUR	3526	2019	WELL AT PATPAR GANJ, DELHI	0.7	BDL	BDL		BDL	7.3			0.06	0.32	1210	
GHAZIPUR	3527	2019	WELL AT PATPARGANJ INDL AREA, DELHI	0.8	BDL	BDL		BDL	7.3			0.05	0.58	2118	
GHAZIPUR	3530	2019	WELL AT PRIYA ENCLAVE, DELHI	0.6	BDL	BDL		BDL	7.2			BDL	0.61	1002	
GHAZIPUR	3543	2018	WELL AT TRILOKPURI, DELHI	0.4	BDL	BDL		BDL				0.95	0.32	10	
GHAZIPUR	3543	2019	WELL AT TRILOKPURI, DELHI	0.8	BDL	BDL		BDL	7.5			0.1	6.71	1110	
OKHLA	3498	2018	WELL AT KALKA JI, DELHI	0.9	BDL	BDL		0.01	7.5			1.02	0.37		
OKHLA	3498	2019		0.7	0.03	BDL		BDL	7.2			3.36	3.34		

STN Code		Sampling Date	Name Of Monitoring Location	Type Water Body	Arsenic(1)	Cadmium(2)	Chloride (mg/l)(3)	Chromium (4)	COD (5)	Copper (6)	Cyanide (7)	TDS (mg/l)(8)	Fluoride(9)	Lead (10)	Mercury (11)	NH3-N (12)	Nickel(13)	pH(14)	Phenolic Compound as C2H5OH (15)	Turbidity (NTU)(16)	Zinc(17)	Iron(18)	TSS (19)
				Desirable Limit for Drinking Water	ND	0.01	250	0.05		0.05	ND	500	1	0.05	ND		-	6.5-8.5	0.001	5	5	1	
1479	BHALSAWA	2018	WESTERN YAMUNA CANAL AT HAIDERPUR WATER WORKS, DELHI	CANAL	BDL	BDL	7	0.43	16	BDL		172	0.3	BDL	BDL		BDL	7.6		1	0.06	1.52	
3030	Ghazipur	2018	SANJAY LAKE, DELHI	LAKE	0.03	BDL	188	0.02	140	0.03		806		0.01	BDL		BDL	8.7			0.38	7.49	
3045	BHALSAWA	2018	WATER WORKS-HAIDERPUR, DELHI	WATER TR	BDL	BDL	12	2	BDL	BDL		182	0.3	BDL	BDL		BDL	7.4		1	0.03	3.91	
1479	BHALSAWA	2019	WESTERN YAMUNA CANAL AT HAIDERPUR WATER WORKS, DELHI	CANAL	BDL	BDL	25	BDL	17	BDL		162	0.2	BDL	BDL		BDL	7.8				0.15	
3031	BHALSAWA	2018	BHALSWA LAKE, DELHI	LAKE	BDL	BDL	1407	BDL	366	BDL		4366	3	BDL	BDL		BDL	8.1			BDL	0.24	
3031	BHALSAWA	2019	BHALSWA LAKE, DELHI	LAKE	BDL	BDL	1534	BDL	370	0.02		4186	0.6	BDL	BDL	11.8	BDL	8.1		18	0.05	0.32	175
3045	BHALSAWA	2019	WATER WORKS-HAIDERPUR, DELHI	WATER TREATMENT PLANT			9		13			160	0.2		BDL			7.6					
3030	Ghazipur	2019	SANJAY LAKE, DELHI	LAKE	0.01	BDL	150	BDL	73	BDL		690	0.6	BDL	BDL		BDL	7.4		12	0.03	3.44	67
1858	Okhla	2018	SARITA VIHAR, DELHI	Drain					866							1.5		7.9					
2057	Okhla	2018	AGRA CANAL, MADANPUR KHADAR, DELHI	CANAL	0.49	0.0004	154	0.06	134							32	0.01	7.9			0.08	1.19	
2057	Okhla	2019	AGRA CANAL, MADANPUR KHADAR, DELHI	CANAL	5E-04	0.0004	188	0.03	133	0.03		568		0.02	BDL	33.3	0.02	7.3			0.09	2.34	

STN Code		Sampling Date	Name Of Monitoring Location	Type Water Body	Arsenic(1)	Cadmium(2)	Chloride (mg/l)(3)	Chromium (4)	COD (5)	Copper (6)	Cyanide (7)	TDS (mg/l)(8)	Fluoride(9)	Lead (10)	Mercury (11)	NH3-N (12)	Nickel(13)	pH(14)	Phenolic Compound as C2H5OH (15)	Turbidity (NTU)(16)	Zinc(17)	Iron(18)	TSS (19)
				Desirable Limit for Drinking Water	ND	0.01	250	0.05		0.05	ND	500	1	0.05	ND		-	6.5-8.5	0.001	5	5	1	
1812	Okhla	2018	YAMUNA AT OKHLA AFTER MEETING OF SHAHDARA DRAIN, DELHI	RIVER	5E-04	0.0004	154	0.06	214	0.03		218		0.0003	0.001	40.7	0.03	7.9			0.09	2.39	
1812	Okhla	2019	YAMUNA AT OKHLA AFTER MEETING OF SHAHDARA DRAIN, DELHI	RIVER	5E-04	0.0004	245	0.08	179	0.04		532		0.01	0.001	38.8		7.7			0.07	12.42	

**WATER QUALITY MONITORING DATA AT THE THREE DUMPSITES**

ANNEXURE VI

Dumpsite	YEAR	Arsenic(1)	Cadmium(2)	Chloride (mg/l)(3)	Chromium (4)	COD (5)	Copper (6)	Cyanide (7)	TDS (mg/l) (8)	Fluoride(9)	Lead (10)	Mercury (11)	NH3-N (12)
	<b>Desirable Limit for Drinking Water</b>	<b>ND</b>	<b>0.01</b>	<b>250</b>	<b>0.05</b>		<b>0.05</b>	<b>ND</b>	<b>500</b>	<b>1</b>	<b>0.05</b>	<b>ND</b>	
Bhalsawa	2017	-	ND	2390	ND		ND	-	5280	0.43	ND	-	
Bhalsawa	2019	ND	0.69	2165	ND		0.58	ND	240	-	ND	ND	
Bhalsawa	2020	-	ND	2390	ND		ND	-	5280	0.43	ND	-	
Bhalsawa	2017	-	ND	1625	ND		ND	-	5230	Nil	ND	-	
Ghazipur	2019	ND	0.69	165	ND		3.58	ND	241	-	ND	ND	
Ghazipur	2020	-	ND	1625	ND		ND	-	890	Nil	ND	-	
Okhla	2017	-	ND	965	ND		ND	-	1990	0.18	ND	-	
Okhla	2019	ND	0.21	1285	ND		ND	ND	175	-	ND	ND	
Okhla	2020	-	ND	965	ND		ND	-	1990	0.18	ND	-	

**WATER QUALITY MONITORING DATA AT THE THREE DUMPSITES**

Dumpsite	YEAR	Nickel(13)	pH(14)	Phenolic Compound as C <sub>2</sub> H <sub>5</sub> OH(15)	Turbidity (NTU)(16)	Zinc(17)	Iron(18)	TSS ( 19)
	<b>Desirable Limit for Drinking Water</b>	-	6.5-8.5	0.001	5	5	0.3	
Bhalsawa	<b>2017</b>	ND	6.8	-	Nil	2.23	0.39	
Bhalsawa	<b>2019</b>	2.01	7	ND	-	ND	5.17	
Bhalsawa	<b>2020</b>	ND	6.8	-	Nil	2.23	0.39	
Bhalsawa	<b>2017</b>	ND	6.8	-	0.24	1.06	0.08	
Ghazipur	<b>2019</b>	3.18	70	ND	-	0.02	4.09	
Ghazipur	<b>2020</b>	ND	6.8	-	0.24	1.06	0.08	
Okhla	<b>2017</b>	ND	6.6	-	NIL	2.23	0.23	
Okhla	<b>2019</b>	2.28	7	ND	-	ND	2.91	
Okhla	<b>2020</b>	ND	6.6	-	NIL	2.23	0.23	

## AIR QUALITY DATA FOR 37 CAAQMS IN DELHI

Station	Parameter	Year	Site	Ann.Average ( $\mu\text{g}/\text{m}^3$ )	Distance
DTU	Benzene	2020	Bhalsawa	3	3-5 km
Rohini	Benzene	2020	Bhalsawa	2	3-5 km
Wazirpur	Benzene	2020	Bhalsawa	3	3-5 km
DTU	NH <sub>3</sub>	2020	Bhalsawa	15	3-5 km
Jahangirpuri	NH <sub>3</sub>	2020	Bhalsawa	55	1-3 km
Rohini	NH <sub>3</sub>	2020	Bhalsawa	56	3-5 km
Wazirpur	NH <sub>3</sub>	2020	Bhalsawa	37	3-5 km
DTU	NO <sub>2</sub>	2020	Bhalsawa	26	3-5 km
Jahangirpuri	NO <sub>2</sub>	2020	Bhalsawa	64	1-3 km
Rohini	NO <sub>2</sub>	2020	Bhalsawa	19	3-5 km
Wazirpur	NO <sub>2</sub>	2020	Bhalsawa	36	3-5 km
DTU	PM <sub>10</sub>	2020	Bhalsawa	168	3-5 km
Jahangirpuri	PM <sub>10</sub>	2020	Bhalsawa	161	1-3 km
Rohini	PM <sub>10</sub>	2020	Bhalsawa	157	3-5 km
Wazirpur	PM <sub>10</sub>	2020	Bhalsawa	160	3-5 km
DTU	PM <sub>2.5</sub>	2020	Bhalsawa	77	3-5 km
Jahangirpuri	PM <sub>2.5</sub>	2020	Bhalsawa	79	1-3 km
Rohini	PM <sub>2.5</sub>	2020	Bhalsawa	81	3-5 km
Wazirpur	PM <sub>2.5</sub>	2020	Bhalsawa	76	3-5 km
DTU	SO <sub>2</sub>	2020	Bhalsawa	10	3-5 km
Jahangirpuri	SO <sub>2</sub>	2020	Bhalsawa	5	1-3 km
Rohini	SO <sub>2</sub>	2020	Bhalsawa	7	3-5 km
Wazirpur	SO <sub>2</sub>	2020	Bhalsawa	16	3-5 km
DTU	Benzene	2019	Bhalsawa	6	3-5 km
Jahangirpuri	Benzene	2019	Bhalsawa	5	1-3 km
Rohini	Benzene	2019	Bhalsawa	3	3-5 km
Wazirpur	Benzene	2019	Bhalsawa	4	3-5 km
DTU	NH <sub>3</sub>	2019	Bhalsawa	32	3-5 km
Jahangirpuri	NH <sub>3</sub>	2019	Bhalsawa	50	1-3 km
Rohini	NH <sub>3</sub>	2019	Bhalsawa	49	3-5 km
Wazirpur	NH <sub>3</sub>	2019	Bhalsawa	45	3-5 km
Burari Crossing	NO <sub>2</sub>	2019	Bhalsawa	37	3-5 km
DTU	NO <sub>2</sub>	2019	Bhalsawa	48	3-5 km
Jahangirpuri	NO <sub>2</sub>	2019	Bhalsawa	65	1-3 km
Rohini	NO <sub>2</sub>	2019	Bhalsawa	34	3-5 km
Wazirpur	NO <sub>2</sub>	2019	Bhalsawa	60	3-5 km

Burari Crossing	PM10	2019	Bhalsawa	179	3-5 km
DTU	PM10	2019	Bhalsawa	232	3-5 km
Jahangirpuri	PM10	2019	Bhalsawa	253	1-3 km
Rohini	PM10	2019	Bhalsawa	241	3-5 km
Wazirpur	PM10	2019	Bhalsawa	288	3-5 km
Burari Crossing	PM2.5	2019	Bhalsawa	110	3-5 km
DTU	PM2.5	2019	Bhalsawa	119	3-5 km
Jahangirpuri	PM2.5	2019	Bhalsawa	129	1-3 km
Rohini	PM2.5	2019	Bhalsawa	129	3-5 km
Wazirpur	PM2.5	2019	Bhalsawa	136	3-5 km
DTU	SO2	2019	Bhalsawa	12	3-5 km
Jahangirpuri	SO2	2019	Bhalsawa	19	1-3 km
Rohini	SO2	2019	Bhalsawa	13	3-5 km
Wazirpur	SO2	2019	Bhalsawa	16	3-5 km
Burari Crossing	PM10	2018	Bhalsawa	217	3-5 km
DTU	PM10	2018	Bhalsawa	236	3-5 km
Jahangirpuri	PM10	2018	Bhalsawa	304	1-3 km
Rohini	PM10	2018	Bhalsawa	293	3-5 km
Wazirpur	PM10	2018	Bhalsawa	316	3-5 km
Burari Crossing	PM2.5	2018	Bhalsawa	126	3-5 km
DTU	PM2.5	2018	Bhalsawa	123	3-5 km
Jahangirpuri	PM2.5	2018	Bhalsawa	131	1-3 km
Rohini	PM2.5	2018	Bhalsawa	127	3-5 km
Wazirpur	PM2.5	2018	Bhalsawa	137	3-5 km
Anand Vihar	Benzene	2020	Ghazipur	3	1-3 km
Anand Vihar	NH3	2020	Ghazipur	33	1-3 km
Patparganj	NH3	2020	Ghazipur	49	3-5 km
Anand Vihar	NO2	2020	Ghazipur	44	1-3 km
Patparganj	NO2	2020	Ghazipur	14	3-5 km
Anand Vihar	PM10	2020	Ghazipur	143	1-3 km
Patparganj	PM10	2020	Ghazipur	111	3-5 km
Anand Vihar	PM2.5	2020	Ghazipur	74	1-3 km
Patparganj	PM2.5	2020	Ghazipur	60	3-5 km
Anand Vihar	SO2	2020	Ghazipur	13	1-3 km
Patparganj	SO2	2020	Ghazipur	6	3-5 km
Anand Vihar	Benzene	2019	Ghazipur	4	1-3 km
Patparganj	Benzene	2019	Ghazipur	2	3-5 km
Anand Vihar	NH3	2019	Ghazipur	54	1-3 km
Patparganj	NH3	2019	Ghazipur	49	3-5 km
Anand Vihar	NO2	2019	Ghazipur	88	1-3 km

Anand Vihar	PM10	2019	Ghazipur	275	1-3 km
Patparganj	PM10	2019	Ghazipur	192	3-5 km
Anand Vihar	PM2.5	2019	Ghazipur	129	1-3 km
Patparganj	PM2.5	2019	Ghazipur	100	3-5 km
Anand Vihar	SO2	2019	Ghazipur	13	1-3 km
Patparganj	SO2	2019	Ghazipur	4	3-5 km
Anand Vihar	PM10	2018	Ghazipur	341	1-3 km
Patparganj	PM10	2018	Ghazipur	216	3-5 km
Anand Vihar	PM2.5	2018	Ghazipur	156	1-3 km
Patparganj	PM2.5	2018	Ghazipur	102	3-5 km
Dr. Karni Singh Shooting Range	Benzene	2020	Okhla	2	1-3 km
Okhla Phase-2	Benzene	2020	Okhla	2	1-3 km
Dr. Karni Singh Shooting Range	NH3	2020	Okhla	23	1-3 km
Okhla Phase-2	NH3	2020	Okhla	34	1-3 km
CRRRI Mathura Road	NO2	2020	Okhla	35	3-5 km
Dr. Karni Singh Shooting Range	NO2	2020	Okhla	28	1-3 km
Okhla Phase-2	NO2	2020	Okhla	30	1-3 km
CRRRI Mathura Road	PM10	2020	Okhla	146	3-5 km
Dr. Karni Singh Shooting Range	PM10	2020	Okhla	119	1-3 km
Okhla Phase-2	PM10	2020	Okhla	138	1-3 km
CRRRI Mathura Road	PM2.5	2020	Okhla	65	3-5 km
Dr. Karni Singh Shooting Range	PM2.5	2020	Okhla	56	1-3 km
Okhla Phase-2	PM2.5	2020	Okhla	64	1-3 km
Dr. Karni Singh Shooting Range	SO2	2020	Okhla	11	1-3 km
Okhla Phase-2	SO2	2020	Okhla	14	1-3 km
Dr. Karni Singh Shooting Range	Benzene	2019	Okhla	4	1-3 km
Okhla Phase-2	Benzene	2019	Okhla	5	1-3 km
Dr. Karni Singh Shooting Range	NH3	2019	Okhla	31	1-3 km
Okhla Phase-2	NH3	2019	Okhla	34	1-3 km
CRRRI Mathura Road	NO2	2019	Okhla	52	3-5 km
Dr. Karni Singh Shooting Range	NO2	2019	Okhla	43	1-3 km
Okhla Phase-2	NO2	2019	Okhla	40	1-3 km

<b>CRRJ Mathura Road</b>	PM10	2019	Okhla	213	3-5 km
<b>Dr. Karni Singh Shooting Range</b>	PM10	2019	Okhla	195	1-3 km
<b>Okhla Phase-2</b>	PM10	2019	Okhla	216	1-3 km
<b>CRRJ Mathura Road</b>	PM2.5	2019	Okhla	104	3-5 km
<b>Dr. Karni Singh Shooting Range</b>	PM2.5	2019	Okhla	97	1-3 km
<b>Okhla Phase-2</b>	PM2.5	2019	Okhla	107	1-3 km
<b>Dr. Karni Singh Shooting Range</b>	SO2	2019	Okhla	15	1-3 km
<b>Okhla Phase-2</b>	SO2	2019	Okhla	13	1-3 km
<b>CRRJ Mathura Road</b>	PM10	2018	Okhla	257	3-5 km
<b>Dr. Karni Singh Shooting Range</b>	PM10	2018	Okhla	199	1-3 km
<b>Okhla Phase-2</b>	PM10	2018	Okhla	252	1-3 km
<b>CRRJ Mathura Road</b>	PM2.5	2018	Okhla	130	3-5 km
<b>Dr. Karni Singh Shooting Range</b>	PM2.5	2018	Okhla	84	1-3 km
<b>Okhla Phase-2</b>	PM2.5	2018	Okhla	106	1-3 km
<b>najafgarh</b>	Benzene	2020	>5 km	2	
<b>narela</b>	Benzene	2020	>5 km	3	
<b>Alipur</b>	Benzene	2020	>5 km	1	
<b>Ashok Vihar</b>	Benzene	2020	>5 km	3	
<b>Dwarka-Sector 8</b>	Benzene	2020	>5 km	3	
<b>ITO</b>	Benzene	2020	>5 km	2	
<b>Jawaharlal Nehru Stadium</b>	Benzene	2020	>5 km	3	
<b>Major Dhyan Chand national</b>	Benzene	2020	>5 km	3	
<b>Mandir Marg</b>	Benzene	2020	>5 km	4	
<b>Mundakaa</b>	Benzene	2020	>5 km	2	
<b>Nehru nagar</b>	Benzene	2020	>5 km	4	
<b>NSIT Dwarka</b>	Benzene	2020	>5 km	2	
<b>Punjabi Bagh</b>	Benzene	2020	>5 km	3	
<b>Pusa-DPCC</b>	Benzene	2020	>5 km	4	
<b>R K Puram</b>	Benzene	2020	>5 km	3	
<b>Shadipur</b>	Benzene	2020	>5 km	3	
<b>Sirifort</b>	Benzene	2020	>5 km	3	
<b>Sonia Vihar</b>	Benzene	2020	>5 km	2	

<b>Sri Aurobindo Marg</b>	Benzene	2020	>5 km	2	
<b>Vivek Vihar</b>	Benzene	2020	>5 km	3	
<b>najafgarh</b>	NH3	2020	>5 km	32	
<b>narela</b>	NH3	2020	>5 km	28	
<b>Alipur</b>	NH3	2020	>5 km	26	
<b>Ashok Vihar</b>	NH3	2020	>5 km	30	
<b>Bawana</b>	NH3	2020	>5 km	31	
<b>Dwarka-Sector 8</b>	NH3	2020	>5 km	30	
<b>IHBAS</b>	NH3	2020	>5 km	30	
<b>ITO</b>	NH3	2020	>5 km	25	
<b>Jawaharlal Nehru Stadium</b>	NH3	2020	>5 km	29	
<b>Major Dhyan Chand national</b>	NH3	2020	>5 km	32	
<b>Mandir Marg</b>	NH3	2020	>5 km	17	
<b>Mundakaa</b>	NH3	2020	>5 km	40	
<b>Nehru nagar</b>	NH3	2020	>5 km	30	
<b>NSIT Dwarka</b>	NH3	2020	>5 km	23	
<b>Punjabi Bagh</b>	NH3	2020	>5 km	26	
<b>Pusa-DPCC</b>	NH3	2020	>5 km	41	
<b>R K Puram</b>	NH3	2020	>5 km	23	
<b>Shadipur</b>	NH3	2020	>5 km	30	
<b>Sirifort</b>	NH3	2020	>5 km	21	
<b>Sonia Vihar</b>	NH3	2020	>5 km	45	
<b>Sri Aurobindo Marg</b>	NH3	2020	>5 km	31	
<b>Vivek Vihar</b>	NH3	2020	>5 km	28	
<b>najafgarh</b>	NO2	2020	>5 km	17	
<b>narela</b>	NO2	2020	>5 km	33	
<b>Alipur</b>	NO2	2020	>5 km	25	
<b>Ashok Vihar</b>	NO2	2020	>5 km	28	
<b>Aya nagar</b>	NO2	2020	>5 km	16	
<b>Bawana</b>	NO2	2020	>5 km	27	
<b>Dwarka-Sector 8</b>	NO2	2020	>5 km	35	
<b>IGI Airport Terminal - 3</b>	NO2	2020	>5 km	32	
<b>IHBAS</b>	NO2	2020	>5 km	34	
<b>ITO</b>	NO2	2020	>5 km	31	
<b>Jawaharlal Nehru Stadium</b>	NO2	2020	>5 km	38	
<b>Lodhi Road</b>	NO2	2020	>5 km	20	
<b>Major Dhyan Chand national</b>	NO2	2020	>5 km	32	

Mandir Marg	NO2	2020	>5 km	30	
Mundakaa	NO2	2020	>5 km	34	
Nehru nagar	NO2	2020	>5 km	33	
North Campus	NO2	2020	>5 km	21	
NSIT Dwarka	NO2	2020	>5 km	23	
Punjabi Bagh	NO2	2020	>5 km	41	
Pusa-DPCC	NO2	2020	>5 km	41	
Pusa-IMD	NO2	2020	>5 km	29	
R K Puram	NO2	2020	>5 km	35	
Shadipur	NO2	2020	>5 km	38	
Sirifort	NO2	2020	>5 km	33	
Sonia Vihar	NO2	2020	>5 km	27	
Sri Aurobindo Marg	NO2	2020	>5 km	20	
Vivek Vihar	NO2	2020	>5 km	34	
najafgarh	PM10	2020	>5 km	123	
narela	PM10	2020	>5 km	161	
Alipur	PM10	2020	>5 km	131	
Ashok Vihar	PM10	2020	>5 km	132	
Aya nagar	PM10	2020	>5 km	103	
Bawana	PM10	2020	>5 km	168	
Dwarka-Sector 8	PM10	2020	>5 km	173	
IGI Airport Terminal - 3	PM10	2020	>5 km	127	
IHBAS	PM10	2020	>5 km	92	
ITO	PM10	2020	>5 km	120	
Jawaharlal Nehru Stadium	PM10	2020	>5 km	125	
Lodhi Road	PM10	2020	>5 km	109	
Major Dhyan Chand national	PM10	2020	>5 km	118	
Mandir Marg	PM10	2020	>5 km	108	
Mundakaa	PM10	2020	>5 km	170	
Nehru nagar	PM10	2020	>5 km	137	
North Campus	PM10	2020	>5 km	119	
NSIT Dwarka	PM10	2020	>5 km	97	
Punjabi Bagh	PM10	2020	>5 km	137	
Pusa-DPCC	PM10	2020	>5 km	118	
Pusa-IMD	PM10	2020	>5 km	102	
R K Puram	PM10	2020	>5 km	121	
Shadipur	PM10	2020	>5 km	95	

Sirifort	PM10	2020	>5 km	143	
Sonia Vihar	PM10	2020	>5 km	133	
Sri Aurobindo Marg	PM10	2020	>5 km	86	
Vivek Vihar	PM10	2020	>5 km	146	
najafgarh	PM2.5	2020	>5 km	60	
narela	PM2.5	2020	>5 km	72	
Alipur	PM2.5	2020	>5 km	64	
Ashok Vihar	PM2.5	2020	>5 km	70	
Aya nagar	PM2.5	2020	>5 km	53	
Bawana	PM2.5	2020	>5 km	82	
Dwarka-Sector 8	PM2.5	2020	>5 km	69	
IGI Airport Terminal - 3	PM2.5	2020	>5 km	56	
IHBAS	PM2.5	2020	>5 km	58	
ITO	PM2.5	2020	>5 km	78	
Jawaharlal Nehru Stadium	PM2.5	2020	>5 km	58	
Lodhi Road	PM2.5	2020	>5 km	55	
Major Dhyan Chand national Stadium	PM2.5	2020	>5 km	59	
Mandir Marg	PM2.5	2020	>5 km	55	
Mundakaa	PM2.5	2020	>5 km	78	
Nehru nagar	PM2.5	2020	>5 km	76	
North Campus	PM2.5	2020	>5 km	55	
NSIT Dwarka	PM2.5	2020	>5 km	69	
Punjabi Bagh	PM2.5	2020	>5 km	71	
Pusa-DPCC	PM2.5	2020	>5 km	59	
Pusa-IMD	PM2.5	2020	>5 km	52	
R K Puram	PM2.5	2020	>5 km	51	
Shadipur	PM2.5	2020	>5 km	54	
Sirifort	PM2.5	2020	>5 km	65	
Sonia Vihar	PM2.5	2020	>5 km	65	
Sri Aurobindo Marg	PM2.5	2020	>5 km	54	
Vivek Vihar	PM2.5	2020	>5 km	72	
najafgarh	SO2	2020	>5 km	10	
narela	SO2	2020	>5 km	12	
Alipur	SO2	2020	>5 km	12	
Ashok Vihar	SO2	2020	>5 km	16	
Bawana	SO2	2020	>5 km	14	

Dwarka-Sector 8	SO2	2020	>5 km	14	
IHBAS	SO2	2020	>5 km	12	
ITO	SO2	2020	>5 km	10	
Jawaharlal Nehru Stadium	SO2	2020	>5 km	18	
Major Dhyan Chand national Stadium	SO2	2020	>5 km	16	
Mandir Marg	SO2	2020	>5 km	15	
Mundakaa	SO2	2020	>5 km	14	
Nehru nagar	SO2	2020	>5 km	11	
NSIT Dwarka	SO2	2020	>5 km	11	
Punjabi Bagh	SO2	2020	>5 km	19	
Pusa-DPCC	SO2	2020	>5 km	14	
R K Puram	SO2	2020	>5 km	13	
Shadipur	SO2	2020	>5 km	9	
Sirifort	SO2	2020	>5 km	8	
Sonia Vihar	SO2	2020	>5 km	18	
Sri Aurobindo Marg	SO2	2020	>5 km	7	
Vivek Vihar	SO2	2020	>5 km	25	
najafgarh	Benzene	2019	>5 km	2	
narela	Benzene	2019	>5 km	3	
Alipur	Benzene	2019	>5 km	1	
Ashok Vihar	Benzene	2019	>5 km	6	
Dwarka-Sector 8	Benzene	2019	>5 km	4	
ITO	Benzene	2019	>5 km	2	
Jawaharlal Nehru Stadium	Benzene	2019	>5 km	3	
Major Dhyan Chand national	Benzene	2019	>5 km	6	
Mandir Marg	Benzene	2019	>5 km	3	
Mundakaa	Benzene	2019	>5 km	4	
Nehru nagar	Benzene	2019	>5 km	4	
North Campus	Benzene	2019	>5 km	1	
NSIT Dwarka	Benzene	2019	>5 km	4	
Punjabi Bagh	Benzene	2019	>5 km	8	
Pusa-DPCC	Benzene	2019	>5 km	6	
Pusa-IMD	Benzene	2019	>5 km	2	
R K Puram	Benzene	2019	>5 km	5	
Shadipur	Benzene	2019	>5 km	6	
Sirifort	Benzene	2019	>5 km	7	
Sonia Vihar	Benzene	2019	>5 km	5	

<b>Sri Aurobindo Marg</b>	Benzene	2019	>5 km	4	
<b>Vivek Vihar</b>	Benzene	2019	>5 km	5	
<b>najafgarh</b>	NH3	2019	>5 km	28	
<b>narela</b>	NH3	2019	>5 km	36	
<b>Alipur</b>	NH3	2019	>5 km	27	
<b>Ashok Vihar</b>	NH3	2019	>5 km	34	
<b>Bawana</b>	NH3	2019	>5 km	39	
<b>Dwarka-Sector 8</b>	NH3	2019	>5 km	29	
<b>IHBAS</b>	NH3	2019	>5 km	38	
<b>ITO</b>	NH3	2019	>5 km	26	
<b>Jawaharlal Nehru Stadium</b>	NH3	2019	>5 km	38	
<b>Major Dhyan Chand national Stadium</b>	NH3	2019	>5 km	31	
<b>Mandir Marg</b>	NH3	2019	>5 km	24	
<b>Mundakaa</b>	NH3	2019	>5 km	42	
<b>Nehru nagar</b>	NH3	2019	>5 km	45	
<b>Punjabi Bagh</b>	NH3	2019	>5 km	49	
<b>Pusa-DPCC</b>	NH3	2019	>5 km	39	
<b>R K Puram</b>	NH3	2019	>5 km	24	
<b>Sirifort</b>	NH3	2019	>5 km	24	
<b>Sonia Vihar</b>	NH3	2019	>5 km	39	
<b>Sri Aurobindo Marg</b>	NH3	2019	>5 km	28	
<b>Vivek Vihar</b>	NH3	2019	>5 km	39	
<b>najafgarh</b>	NO2	2019	>5 km	31	
<b>narela</b>	NO2	2019	>5 km	41	
<b>Alipur</b>	NO2	2019	>5 km	54	
<b>Ashok Vihar</b>	NO2	2019	>5 km	49	
<b>Aya nagar</b>	NO2	2019	>5 km	25	
<b>Bawana</b>	NO2	2019	>5 km	48	
<b>Dwarka-Sector 8</b>	NO2	2019	>5 km	42	
<b>IGI Airport Terminal - 3</b>	NO2	2019	>5 km	47	
<b>IHBAS</b>	NO2	2019	>5 km	43	
<b>ITO</b>	NO2	2019	>5 km	40	
<b>Jawaharlal Nehru Stadium</b>	NO2	2019	>5 km	70	
<b>Lodhi Road</b>	NO2	2019	>5 km	16	

<b>Major Dhyan Chand national Stadium</b>	NO2	2019	>5 km	62	
<b>Mandir Marg</b>	NO2	2019	>5 km	54	
<b>Mundakaa</b>	NO2	2019	>5 km	34	
<b>Nehru nagar</b>	NO2	2019	>5 km	45	
<b>North Campus</b>	NO2	2019	>5 km	24	
<b>NSIT Dwarka</b>	NO2	2019	>5 km	28	
<b>Punjabi Bagh</b>	NO2	2019	>5 km	59	
<b>Pusa-DPCC</b>	NO2	2019	>5 km	61	
<b>Pusa-IMD</b>	NO2	2019	>5 km	30	
<b>R K Puram</b>	NO2	2019	>5 km	53	
<b>Shadipur</b>	NO2	2019	>5 km	62	
<b>Sirifort</b>	NO2	2019	>5 km	55	
<b>Sonia Vihar</b>	NO2	2019	>5 km	35	
<b>Sri Aurobindo Marg</b>	NO2	2019	>5 km	37	
<b>Vivek Vihar</b>	NO2	2019	>5 km	32	
<b>najafgarh</b>	PM10	2019	>5 km	160	
<b>narela</b>	PM10	2019	>5 km	231	
<b>Alipur</b>	PM10	2019	>5 km	201	
<b>Ashok Vihar</b>	PM10	2019	>5 km	226	
<b>Aya nagar</b>	PM10	2019	>5 km	161	
<b>Bawana</b>	PM10	2019	>5 km	253	
<b>Dwarka-Sector 8</b>	PM10	2019	>5 km	296	
<b>IGI Airport Terminal - 3</b>	PM10	2019	>5 km	197	
<b>ITO</b>	PM10	2019	>5 km	174	
<b>Jawaharlal Nehru Stadium</b>	PM10	2019	>5 km	219	
<b>Lodhi Road</b>	PM10	2019	>5 km	164	
<b>Major Dhyan Chand national</b>	PM10	2019	>5 km	204	
<b>Mandir Marg</b>	PM10	2019	>5 km	201	
<b>Mundakaa</b>	PM10	2019	>5 km	283	
<b>Nehru nagar</b>	PM10	2019	>5 km	223	
<b>North Campus</b>	PM10	2019	>5 km	240	
<b>Punjabi Bagh</b>	PM10	2019	>5 km	210	
<b>Pusa-DPCC</b>	PM10	2019	>5 km	213	
<b>Pusa-IMD</b>	PM10	2019	>5 km	161	
<b>R K Puram</b>	PM10	2019	>5 km	221	
<b>Sirifort</b>	PM10	2019	>5 km	283	

Sonia Vihar	PM10	2019	>5 km	214	
Sri Aurobindo Marg	PM10	2019	>5 km	170	
Vivek Vihar	PM10	2019	>5 km	232	
najafgarh	PM2.5	2019	>5 km	92	
narela	PM2.5	2019	>5 km	109	
Alipur	PM2.5	2019	>5 km	107	
Ashok Vihar	PM2.5	2019	>5 km	121	
Aya nagar	PM2.5	2019	>5 km	81	
Bawana	PM2.5	2019	>5 km	131	
Dwarka-Sector 8	PM2.5	2019	>5 km	110	
IGI Airport Terminal - 3	PM2.5	2019	>5 km	89	
IHBAS	PM2.5	2019	>5 km	114	
ITO	PM2.5	2019	>5 km	110	
Jawaharlal Nehru Stadium	PM2.5	2019	>5 km	106	
Lodhi Road	PM2.5	2019	>5 km	85	
Major Dhyan Chand national Stadium	PM2.5	2019	>5 km	95	
Mandir Marg	PM2.5	2019	>5 km	104	
Mundakaa	PM2.5	2019	>5 km	126	
Nehru nagar	PM2.5	2019	>5 km	124	
North Campus	PM2.5	2019	>5 km	110	
NSIT Dwarka	PM2.5	2019	>5 km	113	
Punjabi Bagh	PM2.5	2019	>5 km	108	
Pusa-DPCC	PM2.5	2019	>5 km	101	
Pusa-IMD	PM2.5	2019	>5 km	82	
R K Puram	PM2.5	2019	>5 km	102	
Shadipur	PM2.5	2019	>5 km	119	
Sirifort	PM2.5	2019	>5 km	108	
Sonia Vihar	PM2.5	2019	>5 km	105	
Sri Aurobindo Marg	PM2.5	2019	>5 km	91	
Vivek Vihar	PM2.5	2019	>5 km	114	
najafgarh	SO2	2019	>5 km	14	
narela	SO2	2019	>5 km	15	
Alipur	SO2	2019	>5 km	23	
Ashok Vihar	SO2	2019	>5 km	20	
Bawana	SO2	2019	>5 km	14	
Dwarka-Sector 8	SO2	2019	>5 km	20	

IHBAS	SO2	2019	>5 km	14	
ITO	SO2	2019	>5 km	9	
Jawaharlal Nehru Stadium	SO2	2019	>5 km	18	
Major Dhyan Chand national	SO2	2019	>5 km	13	
Mandir Marg	SO2	2019	>5 km	6	
Mundakaa	SO2	2019	>5 km	17	
Nehru nagar	SO2	2019	>5 km	18	
NSIT Dwarka	SO2	2019	>5 km	14	
Punjabi Bagh	SO2	2019	>5 km	20	
Pusa-DPCC	SO2	2019	>5 km	15	
R K Puram	SO2	2019	>5 km	10	
Shadipur	SO2	2019	>5 km	11	
Sirifort	SO2	2019	>5 km	9	
Sonia Vihar	SO2	2019	>5 km	13	
Sri Aurobindo Marg	SO2	2019	>5 km	9	
Vivek Vihar	SO2	2019	>5 km	19	
najafgarh	PM10	2018	>5 km	204	
narela	PM10	2018	>5 km	258	
Ashok Vihar	PM10	2018	>5 km	267	
Aya nagar	PM10	2018	>5 km	188	
Bawana	PM10	2018	>5 km	279	
Dwarka-Sector 8	PM10	2018	>5 km	298	
IGI Airport (T3)	PM10	2018	>5 km	192	
ITO	PM10	2018	>5 km	189	
Jawaharlal Nehru Stadium	PM10	2018	>5 km	237	
Lodhi Road	PM10	2018	>5 km	200	
Major Dhyan Chand national	PM10	2018	>5 km	235	
Mandir Marg	PM10	2018	>5 km	224	
Mundaka	PM10	2018	>5 km	321	
Nehru nagar	PM10	2018	>5 km	231	
North Campus	PM10	2018	>5 km	245	
Punjabi Bagh	PM10	2018	>5 km	233	
Pusa-DPCC	PM10	2018	>5 km	227	
Pusa-IMD	PM10	2018	>5 km	170	
R K Puram	PM10	2018	>5 km	238	
Sirifort	PM10	2018	>5 km	269	
Sonia Vihar	PM10	2018	>5 km	243	

<b>Sri Aurobindo Marg</b>	PM10	2018	>5 km	181	
<b>Vivek Vihar</b>	PM10	2018	>5 km	254	
<b>najafgarh</b>	PM2.5	2018	>5 km	95	
<b>narela</b>	PM2.5	2018	>5 km	117	
<b>Ashok Vihar</b>	PM2.5	2018	>5 km	121	
<b>Aya nagar</b>	PM2.5	2018	>5 km	94	
<b>Bawana</b>	PM2.5	2018	>5 km	130	
<b>Dwarka-Sector 8</b>	PM2.5	2018	>5 km	108	
<b>IGI Airport (T3)</b>	PM2.5	2018	>5 km	95	
<b>IHBAS</b>	PM2.5	2018	>5 km	95	
<b>ITO</b>	PM2.5	2018	>5 km	121	
<b>Jawaharlal Nehru Stadium</b>	PM2.5	2018	>5 km	114	
<b>Lodhi Road</b>	PM2.5	2018	>5 km	91	
<b>Major Dhyan Chand national</b>	PM2.5	2018	>5 km	96	
<b>Mandir Marg</b>	PM2.5	2018	>5 km	111	
<b>Mundaka</b>	PM2.5	2018	>5 km	154	
<b>Nehru nagar</b>	PM2.5	2018	>5 km	119	
<b>North Campus</b>	PM2.5	2018	>5 km	109	
<b>NSIT Dwarka</b>	PM2.5	2018	>5 km	112	
<b>Punjabi Bagh</b>	PM2.5	2018	>5 km	128	
<b>Pusa-DPCC</b>	PM2.5	2018	>5 km	106	
<b>Pusa-IMD</b>	PM2.5	2018	>5 km	99	
<b>R K Puram</b>	PM2.5	2018	>5 km	113	
<b>Shadipur</b>	PM2.5	2018	>5 km	115	
<b>Sirifort</b>	PM2.5	2018	>5 km	104	
<b>Sonia Vihar</b>	PM2.5	2018	>5 km	119	
<b>Sri Aurobindo Marg</b>	PM2.5	2018	>5 km	96	
<b>Vivek Vihar</b>	PM2.5	2018	>5 km	111	

## Inspection report format for legacy Waste Dumpsites

Serial No.		Item	Remarks
<b>1</b>		<b>General Information</b>	
	A	City & Location of Dumpsite	Ghazipur Dumpsite under East Delhi Municipal Corporation, Delhi
	B	Name, Designation & Contact Details of Nodal Officers for Bio mining	Pesh Nawaz, Junior Engineer
	C	Stage of Bio mining (Planned/Being Executed/Completed)	Being Executed
<b>2</b>		<b>Volume of Waste</b>	14 million Tonne
	A	Has Contour Survey of site been Done (Y/N)	Yes. A Contour Map was prepared in 2020 on August.
	B	Length (Initial -M)	As informed, dumpsite is spread over in 70 acre area.
	C	Width (Initial -M)	
		Height (Initial -M)	65 meter, As informed, height of the site has been reduced to 56 meters.
		Total Volume (Cub. Meter)	14 million Tonne
<b>3</b>		<b>Characteristics of Waste</b>	-
<b>4</b>	A	<b>Leachate Characteristics</b>	-
<b>5</b>		<b>Baseline Survey</b>	
	A	Ground Water Analysis	Not provided
	B	Soil Analysis	Not provided
	C	Quantity Of Waste Processed Per Day (TPD)	3000-3200 TPD
<b>6</b>		<b>Process Flowsheet of Bio-Mining</b>	Bio culture sprinkling on Windrows →Turning of windrows →Cartage to trommels→ Feeding into 30 mm screen trommels → Feeding into 06 mm screen trommels
<b>7</b>		<b>Stabilization of waste</b>	
	A	Type of bio-mining method Adopted (Tractor tiller, Trench method; Cone Method; Windrow, Thin Layer Method)	Windrow
	B	Machinery used for Excavating	Excavators, loaders

		Dumpsite (Tractor Tiller Etc. )	
	C	Machinery Used for preparing Windrows (JCB etc )	Excavator & JCB
	D	Are large objects removed prior to windrow preparation	Yes
	E	Are Windrows Turned Every 4-5 Days	Yes
	F	Duration of Stabilization	28 days
	G	Bio culture Used	Yes
	H	Is End Product Stabilized (No Heat / Gas /leachate /Smell)	Yes
	I	Is leachate Being Generated From the waste	No
	J	If Yes, methodology for leachate Management Adopted	Leachate is not being treated, it is meeting nearby drain and some portion is used in recirculation on fresh waste.
<b>8</b>		<b>Processing of Legacy Waste</b>	
		Machinery Used For processing of legacy waste	Hydraulic Excavator, Bulldozer
	a	<b>Screening</b>	Yes
	i	Trommel (Number & Capacity (TPD))	<ul style="list-style-type: none"> <li>• 11 Nos. of 300 TPD Trommel (30 mm sieve size) are working</li> <li>• 5 Number of 300 TPD trommels (6 mm sieve size) in series with 30 mm trommels.</li> </ul>
	ii	Size of screens used (Mostly used 150 mm, 80 to 100 mm, 24 to 50mm, 1216 mm and 4-6)	6 mm and 30 mm sieve size Trommels
	iii	Vibrating Screen (No)	No
	iv	Electromagnet (For separating ferrous metals)	No
	v	Air Classifier (for separating light material from heavy organic)	Blower
	vi	Disc/Star (No)	No
	b	<b>Handling</b>	
	i	Loader (No.)	14 Nos.
	ii	Conveyor (No.)	60 Nos.
	iii	Fork Lift (No.)	No

	iv	Categories in which the waste is segregated (Compost/Recyclables/RDF/C&D/Inerts etc)	C&D waste, Refused Derived Fuel (RDF,) and inert (-30mm to + 6mm)& compost ( -6 mm )
	v	Quantity of items which is being generated in each category	As informed, ~15-20% RDF, ~10-15% C&D waste & ~60-70% inerts (below 30 mm) are being generated after screening.
	vi	Quantity of items being utilized of different categories	<p>As informed segregated waste has been utilized as given below: (<b>Annexure-B-1</b>)</p> <ul style="list-style-type: none"> <li>• 0.5 lakh ton of RDF has been sent to nearby Ghazipur WtE plant (IL&amp;FS).</li> <li>• 0.48 lakh ton of under &lt;6 mm fraction is being sent to Eco park NTPC Badarpur and 0.65 lakh ton C&amp;D waste has been utilized in own SLF site to prepare ramps and capping.</li> <li>• 1.45 lakh ton of Inert (&lt; 30 mm) has been sent to Vinod nagar to fill low lying area.</li> <li>• Some amount of RDF and inert is dumped at SLF site.</li> </ul>
	vii	Documents supporting usage of different fractions (Bio earth/Recyclable/RDF/Other wastes)	<ul style="list-style-type: none"> <li>• Screen fraction &lt;6 mm is being sent to Eco park NTPC Badarpur. (<b>Annexure-B-II</b>)</li> <li>• Inert (&lt; 30 mm) is being sent to Vinod nagar low lying area at its own premises. Record shown at site.</li> <li>• No supporting document has been provided for RDF sent to WtE plant Ghazipur.</li> </ul>
	viii	Analysis results of fine earth	Attached as <b>Annexure-III</b>
	ix	Frequency of testing of bio-earth	-
<b>9</b>		<b>Miscellaneous</b>	
	a	Have fires being reported at the site	Yes, 1 fire incident was reported on 24.11.2020 at fresh waste towards live stock market.
	b	Methodology to tackle fires	With the excavator and fire tender if required.
	c	Is fresh waste being dumped at the	Yes

		site	
		d	Percentage land recovered so far
		e	Is third party audit of bio mining being done
10			<p><b>Other observations</b></p> <ol style="list-style-type: none"> <li>1. As informed, approx. 2000 TPD of fresh waste is being dumped at dumpsite <i>including 550 TPD inert from WtE Plant.</i></li> <li>2. As informed, height of the site has been reduced from 65 meters to 56 meters.</li> <li>3. Total 3.5 lakh ton of legacy waste has been processed till date (Annexure-I).</li> <li>4. RDF and inert was observed dump at SLF site during inspection.</li> <li>5. Analysis of RDF has not been done.</li> <li>6. Analysis report of screen fraction &lt;6mm is not complying with standard of compost as per SWM Rules, 2016 (i.e. Total Nitrogen, potassium, phosphorous and Total organic Carbon) <b>Annexure-III.</b></li> <li>7. Leachate flow was observed and it is being discharge in nearest local drain.</li> </ol>
			<b>Name &amp; Designation of Inspecting Officer</b>
			Ms. Yogesh Chandra Sc-B, CPCB & Atanu Dey, RA
			<b>Date of Inspection</b>
			21.01.2021

Annexure - B-1

Legacy waste report of SLF Ghazipur

	Total	from october 2020 to december 2020
Total legacy waste process	3.50 lacs MT	1.64 lacs MT
Total rdf genrated (MT)	0.5 lacs mt	0.19 LACS MT
Total 30 mm sent to vinod nagar and used at site (MT)	1.45 LACS MT	0.65 LACS MT
Total sent to NTPC ECOPARK and others (MT)	0.48 LACS MT	0.22 LACS MT
Total C and D used at site (MT)	0.65 LACS MT	0.25 LACS MT

↓  
2020



**EAST DELHI MUNICIPAL CORPORATION**  
ENVIRONMENT MANAGEMENT SERVICES

**WEIGHTMENT SLIP**

SANITARY LAND FILL SITE GHAZIPOUR DELHI

6mm

I. No.: 1135	Date: 21/01/2021 03:04:53	0145207
Vehicle No.: HR55V4769	Vehicle: 0145207	
Name of Driver: Garbage	Ward No./Dalao:	<p>HELP US TO KEEP DELHI CLEAN AND GREEN</p>
Gross wt. (Kgs.): Garbage Ref: 35557	Time:	
Nett wt. (Kgs.): In Wt.: 24540	Time: IN 21/01/2021 03:17:42	
Out Wt.: 11340	Time: OUT 21/01/2021 03:17:42	
Nett Wt.: 13200	TIME SPENT SLF > 30 Min	
	EMPTY WT. DIFF. EXCEEDED LIMIT (Operator Sign.)	

सु. प्रेस-जाब 839-800 किताब प्रत्येक 4 50 पृष्ठ 15-16-2019

पूर्वी दिल्ली नगर निगम

एस.एल.एफ. गाजीपुर

35557

सैनिट्री लेण्डफिल पर आये मलबे/सिल्ट की पूर्वी  
SLF GHAZIPOUR TO M7PC  
SITE: BANK R/F

10 Bank 14/08/2020

W.O. No.....

संख्या \_\_\_\_\_ दिनांक 21/01/2021

मंडल \_\_\_\_\_ उप-मंडल ATSF

कनिष्ठ अभियन्ता का नाम PESH NAUWAS

ठेकेदार का नाम M/S SUMASTIK CARRIERS

ट्रक सं. HR55V 4769 ड्राइवर का नाम HARUN

गाड़ी पूरी भरी है / नहीं भरी है

गाड़ी आने का समय

24540

हस्ता. कनिष्ठ अभियन्ता

Junior Engineer  
S. कनिष्ठ अभियन्ता  
Ghaziipur,  
Municipal Corpn. of Delhi

for Sushy



# SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

19, University Road, Delhi - 110007 (India)  
An ISO - 9001, 14001 & OHSAS 18001 Certified Institute

Website : www.shriraminstitute.org  
E-mail id : customercare@shriraminstitute.org

TEST CERTIFICATE

NO : C1/0000228154

26 mm  
Compost

**Issued To :**

Client Code : (NDLS01E0492)  
EAST DELHI MUNICIPAL CORPORATION  
OFFICE OF THE EXECUTIVE ENGINEER (SLF),  
ADJACENT TO MC PRIMARY SCHOOL, LALITA  
PARK, NEAR LAXMI NAGAR METRO STATION  
NEW DELHI  
DELHI-110092

Date : 15-09-2020  
Job No : 2008-1-421-1744  
Booking No : RG2021/1/3326  
Booking Date : 24-08-2020  
Customer Ref No. : NO.EE(SLF)/EDMC 2020-21/D-422  
Customer Ref Dt. : 21-08-2020

Kind Attn: MR. SANJAY KUMAR, EXECUTIVE  
ENGINEER (SLF)

**Sample Particulars:**

One Sealed sample of Legacy waste describe as Sample -I for trommel-I, NOW: Hiring of segregating trommels for Bio-Mining and Bio-Remediation of old dump waste at Bhalswa, Okhla and Ghazipur seal not legible was received.

Note: The sampling was not carried out by Shriram Institute for Industrial Research. The sample details provided in the test certificate are based on the declaration by sponsor.

S. No.	Tests	Results	Protocol/Test Method
1.	Total Nitrogen (as N), % by mass (on dry basis)	0.3	ASTM D 5373 guidelines
2.	Potassium (as K <sub>2</sub> O), % by mass (on dry basis)	0.3	Method No. 3050, 3052 of EPA SW-846
3.	Phosphorus (as P <sub>2</sub> O <sub>5</sub> ), % by mass (on dry basis)	0.3	Method No. 3050, 3052 of EPA SW-846
4.	Total Organic Carbon % by mass (on dry basis)	5.3	Soil Testing Manual of India
5.	pH (1:5)	7.4	As per FCO Standards

ETA runs  
Pending

*Asish Chatterjee*  
AUTHORISED SIGNATORY  
EMPLOYEE CODE: ( 6171 )

GC-01(Rev-05)

1/2

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Website : www.shriraminstitute.org  
E-mail id : customercare@shriraminstitute.org

TEST CERTIFICATE

NO : C1/0000228154

TCLP Study:

S. No.	Parameter	Results (mg/l)	Detection Limit (mg/l)	Max Concentration (mg/l)	Protocol/ Method of test
1.	Arsenic (as As), mg/l	0.01	0.005	5.0	CPCB Manual on Sampling, Analysis and Characterization of Hazardous Waste (TCLP Study 20:1)
2.	Selenium (as Se), mg/l	Below Detection Limit	0.005	1.0	
3.	Mercury (as Hg), mg/l	Not Detected	0.002	0.2	
4.	Copper (as Cu), mg/l	0.89	0.01	25.0	
5.	Nickel (as Ni), mg/l	0.09	0.01	20.0	
6.	Cobalt (as Co), mg/l	0.01	0.01	80.0	
7.	Lead (as Pb), mg/l	0.04	0.01	5.0	
8.	Cadmium (as Cd), mg/l	0.03	0.01	1.0	
9.	Chromium (as Cr), mg/l	0.02	0.01	5.0	
10.	Zinc (as Zn), mg/l	3.7	0.01	250	

\*\*\*\*\*

DOR: 24.08.2020  
DOC: 14.09.2020

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81



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6m<sup>+</sup> - 230mm  
Inert

TEST CERTIFICATE

NO : C1/0000228155

**Issued To :**

Client Code : (NDLS01E0492)  
EAST DELHI MUNICIPAL CORPORATION  
OFFICE OF THE EXECUTIVE ENGINEER (SLF),  
ADJACENT TO MC PRIMARY SCHOOL, LALITA  
PARK, NEAR LAXMI NAGAR METRO STATION  
NEW DELHI  
DELHI-110092

Date : 15-09-2020  
Job No : 2008-1-421-1745  
Booking No : RG2021/1/3326  
Booking Date : 24-08-2020  
Customer Ref No. : NO.EE(SLF)/EDMC/2020-21/D-422  
Customer Ref Dt. : 21-08-2020

Kind Attn: MR. SANJAY KUMAR, EXECUTIVE  
ENGINEER (SLF)

**Sample Particulars:**

One Sealed sample of Legacy waste describe as Sample -2 for trommel-2, NOW: Hiring of segregating trommels for Bio-Mining and Bio-Remediation of old dump waste at Bhalswa, Okhla and Ghazipur seal not legible was received.

Note: The sampling was not carried out by Shriram Institute for Industrial Research. The sample details provided in the test certificate are based on the declaration by sponsor.

S. No.	Tests	Results	Protocol/Test Method
1.	Total Nitrogen (as N), % by mass (on dry basis)	0.2	ASTM D 5373 guidelines
2.	Potassium (as K <sub>2</sub> O), % by mass (on dry basis)	0.4	Method No. 3050, 3052 of EPA SW-846
3.	Phosphorus (as P <sub>2</sub> O <sub>5</sub> ), % by mass (on dry basis)	0.2	Method No. 3050, 3052 of EPA SW-846
4.	Total Organic Carbon % by mass (on dry basis)	4.2	Soil Testing Manual of India
5.	pH (1:5)	7.3	As per FCO Standards

*As Chatterjee*  
AUTHORISED SIGNATORY  
EMPLOYEE CODE: (6171)

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Website : www.shriraminstitute.org  
E-mail id : customercare@shriraminstitute.org

TEST CERTIFICATE

NO : C1/0000228155

TCLP Study:

S. No.	Parameter	Results (mg/l)	Detection Limit (mg/l)	Max Concentration (mg/l)	Protocol/ Method of test
1.	Arsenic (as As), mg/l	0.01	0.005	5.0	CPCB Manual on Sampling, Analysis and Characterization of Hazardous Waste (TCLP Study 20:1)
2.	Selenium (as Se), mg/l	Below Detection Limit	0.005	1.0	
3.	Mercury (as Hg), mg/l	Below Detection Limit	0.002	0.2	
4.	Copper (as Cu), mg/l	0.33	0.01	25.0	
5.	Nickel (as Ni), mg/l	0.07	0.01	20.0	
6.	Cobalt (as Co), mg/l	0.01	0.01	80.0	
7.	Lead (as Pb), mg/l	0.02	0.01	5.0	
8.	Cadmium (as Cd), mg/l	0.02	0.01	1.0	
9.	Chromium (as Cr), mg/l	0.01	0.01	5.0	
10.	Zinc (as Zn), mg/l	2.9	0.01	250	

\*\*\*\*\*

DOR: 24.08.2020  
DOC: 14.09.2020

*to sehatija*  
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EMPLOYEE CODE: ( 6171 )

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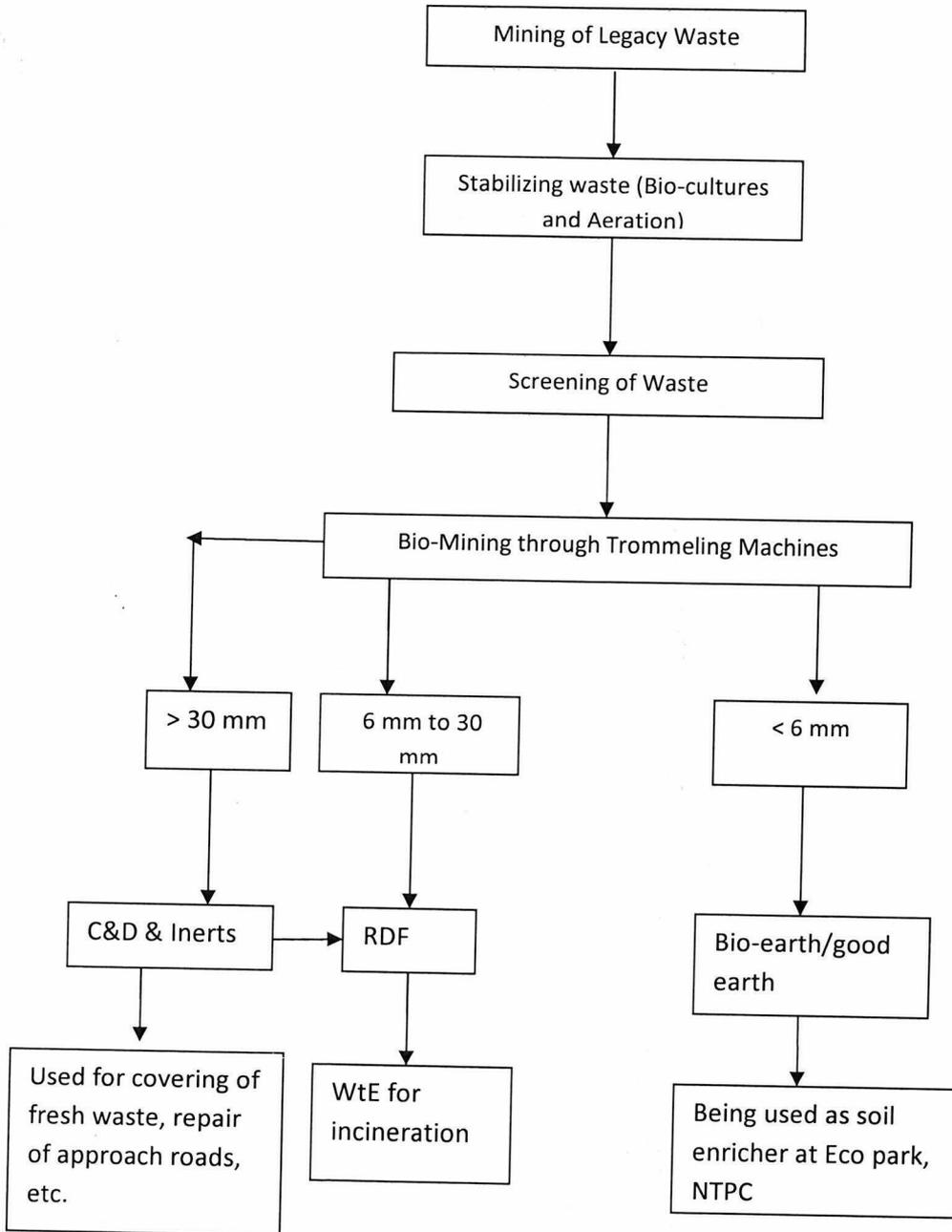
See overleaf for terms & conditions

<b>Inspection report format for legacy Waste Dumpsites</b>		
<b>Serial No.</b>	<b>Item</b>	<b>Remarks</b>
1		<b>General Information</b>
	A	City & Location of Dumpsite Okhla Dumpsite at Maa Anand Mai Marg, Okhla Phase-I, SDMC,
	B	Name, Designation & Contact Details of Nodal Officers for Biomining Mr. Sanjay Hingorani, Assistant Engineer
	c	Stage of Biomining (Planned/Being Executed/Completed) Being Executed
2		<b>Volume of Waste</b>
	A	Has Contour Survey of site been Done (Y/N) Yes
	B	Length (Initial -M) -
	C	Width (Initial -M) -
		Height (Initial -M) 40 m
		Total Volume (Cub. Meter) 60 lakh MT
3		<b>Characteristics of Waste</b> Not done
4	A	Leachate Characteristics As informed, leachate has not been collected and tested so far.
5		<b>Baseline Survey</b>
	A	Ground Water Analysis As informed, test not done
	B	Soil Analysis As informed, test not done
	C	Quantity Of Waste Processed Per Day (TPD) 1800 TPD
6		<b>Process Flowsheet of Bio-Mining</b> Biomining Process Flowsheet is attached as <b>Annexure-I</b> .
7		<b>Stabilization of waste</b>
	A	Type of biomining method Adopted (Tractor tiller, Trench method; Cone Method; Windrow, Thin Layer Method) Windrow method
	B	Machinery used for Excavating Dumpsite (Tractor Tiller Etc ) Excavator -7 Nos. Bulldozer- 7 Nos
	C	Machinery Used for preparing Windrows (JCB etc ) Excavator
	D	Are large objects removed prior to windrow preparation Yes

	E	Are Windrows Turned Every 4-5 Days	Yes
	F	Duration of Stabilization	30 days
	G	Bio culture Used	Used 'Enbiozyme-Aqua CO' as a bio-culture
	H	Is End Product Stabilized (No Heat / Gas /leachate /Smell)	Yes
	I	Is leachate Being Generated From the waste	No leachate observed in legacy waste during inspection
	J	If Yes, methodology for leachate Management Adopted	NA
8		<b>Processing of Legacy Waste</b>	
		Machinery Used For processing of legacy waste	Hydraulic excavator, bulldozers
	a	<b>Screening</b>	
	i	Trommel (Number & Capacity (TPD))	6 Numbers of each 30 mm sieve size (300 TPD) and 4 numbers of each 6 mm sieve size Trommels (300 TPD) are operational. The trommels are connected in a series i.e. one 30 mm trommel is connected with 6 mm trommel. Apart from it 2 nos of 30mm sieve size trommels were installed but were not operational during visit.
	ii	Size of screens used (Mostly used 150 mm, 80 to 100 mm, 24 to 50mm, 1216 mm and 4-6)	6 mm- 4 Nos. 30 mm- 8 Nos.
	iii	Vibrating Screen (No)	No
	iv	Electromagnet (For separating ferrous metals)	No
	v	Air Classifier (for separating light material from heavy organic)	Yes
	vi	Disc/Star (No)	No
	b	<b>Handling</b>	
	i	Loader (No.)	No, loading is being done through excavator.
	ii	Conveyor (No.)	4 Nos.
	iii	Fork Lift (No.)	Nil

	iv	Categories in which the waste is segregated (Compost/Recyclables/RDF/C&D/Inerts etc)	Refused Derived Fuel (RDF), inert (+6 to -30 mm); compost (-6 mm fraction); and C&D and inert waste (+30)
	v	Quantity of items which is being generated in each category	As informed, 10% RDF, 10% C&D, 50% Compost & 30% inert are generated from the legacy waste.
	vi	Quantity of items being utilized of different categories	<p>As informed segregated waste has been utilized as given below:</p> <ul style="list-style-type: none"> <li>• 87000 ton of compost and 58000 ton C&amp;D waste has been utilized in own SLF site.</li> <li>• Approx. 116000 of Inert (&lt; 30mm to +6mm) has been sent Eco-park NTPC, SLF Jaitpur/Tajpur in low lying areas. Along with that it is used in covering of slopes/platforms at SLF Okhla.</li> <li>• Some amount of RDF and inert is dumped at SLF.</li> <li>• RDF has been sent to WtE sukhdev Vihar. No supporting documents have been provided for RDF utilization.</li> </ul>
	vii	Documents supporting usage of different fractions (Bioearth/Recyclable/RDF/Other wastes)	
	viii	Analysis results of fine earth	<b>Annexure-II</b>
	ix	Frequency of testing of bio-earth	-
9		Miscellaneous	
	a	Have fires being reported at the site	No
	b	Methodology to tackle fires	No
	c	Is fresh waste being dumped at the site	Fresh waste is being dumped at adjoining 6.2 acres approx. land
	d	Percentage land recovered so far	Cannot be assessed as biomining is being done from different side of dumpsite.
	e	Is third party audit of biomining being done	No
10		Other observations	1. Total <b>3.1 Lakh MT</b> of legacy

			<p>waste has been processed till now.</p> <ol style="list-style-type: none"> <li>2. As informed, approx. 1800TPD fresh waste is being dumped at dumpsite.</li> <li>3. RDF and inert was observed dump at SLF site during inspection. No supporting documents have been provided for RDF utilization.</li> <li>4. Compost analysis report is not complying with standard of compost as per SWM Rules, 2016 (i.e. Total Nitrogen, potassium, phosphorous and C:N Ratio) <b>Annexure-III</b></li> <li>5. Ground water analysis, leachate characteristics, soil analysis, RDF analysis not yet done.</li> </ol>
		Name & Designation of Inspecting Officer	Ms. Yogesh Chandra, Scientist-B
		Date of Inspection	14.01.2021



# SHIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

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Email id : [customercare@shriraminstitute.org](mailto:customercare@shriraminstitute.org)

Annexure-c-II

4709  
27/8/2020

205  
27/8/2020  
NO: CI/000224572

## TEST CERTIFICATE

Issued To :

Client Code : (DLH0150818)  
SOUTH DELHI MUNICIPAL CORPORATION  
O/O THE EE (SLF) OKHLA, GATE NO, 4 ROOM NO, 6  
OFFICE COMPLEX DR. AMBEDKER STADIUM  
DELHI GATE  
DELHI  
DELHI-110002

Date : 11-08-2020  
Job No : 2007-1421-841  
Booking No : RC2021/1/1758  
Booking Date : 09-07-2020  
Customer Ref No. : EE/SLF/O/SOMC/2020-21/58  
Customer Ref Dt. : 08-07-2020

Kind Attn: MR. DEEPAK KUMAR,EE (SLF) OKHLA

### Sample Particulars:

One Sample of Fine Material Fraction of Legacy Waste drawn by our representative on 20.07.2020 as per details given below was received.

1. Name & address of the Site : M/s. Landfill Site Okhla  
Phase -I, Okhla, Delhi
2. Site Representative : Mr. Ravi Kumar Prajapati (J.E.)
3. Location of Sampling : Trommel No- 2 (less than 6 mm Size)
4. Date of Sampling : 20.07.2020

S. No.	Tests	Results	Protocol/Test Method
1.	C: N Ratio, % by mass (on dry basis)	17.8	IS-1150 Part-4 By Calculation
2.	Grain Size	Sand %	64
		Silt %	29
		Clay %	8
3.	Total Nitrogen (as N), % by mass (on dry basis)	0.27	ASTM D-5373 guidelines
4.	Potassium (as K <sub>2</sub> O), % by mass (on dry basis)	0.25	Method No- 3050, 3052 of EPA SW-846
5.	Phosphorus (as P <sub>2</sub> O <sub>5</sub> ), % by mass (on dry basis)	0.3	Method No- 3050, 3052 of EPA SW-846

RE/SLF  
JE-II  
27/8

*K. Chatterjee*  
AUTHORISED SIGNATORY  
EMPLOYEE CODE: [171]

Shriram Institute for Industrial Research  
Detailed interpretation of test results cannot be undertaken by inference to the original report.

Phone : 01-11-27000190, 27667267, 27667860

Fax : 01-11-27667267

See overleaf for terms & conditions

Shriram Group Ltd

TEST CERTIFICATE

NO : CI/0000224572

TCLP Study:

S. No.	Parameter	Results (mg/l)	Detection Limit (mg/l)	Max Concentration (mg/l)	Protocol/ Method of test
1.	Arsenic (as As), mg/l	0.01	0.005	5.0	CPCB Manual on Sampling, Analysis and Characterization of Hazardous Waste (TCLP Study 20:1)
2.	Selenium (as Se), mg/l	Below Detection Limit	0.005	1.0	
3.	Mercury (as Hg), mg/l	Below Detection Limit	0.002	0.2	
4.	Copper (as Cu), mg/l	0.14	0.01	25.0	
5.	Nickel (as Ni), mg/l	0.07	0.01	20.0	
6.	Cobalt (as Co), mg/l	0.03	0.01	80.0	
7.	Iron (as Fe), mg/l	4.1	0.01	--	
8.	Cadmium (as Cd), mg/l	0.02	0.01	1.0	
9.	Chromium (as Cr), mg/l	0.01	0.01	5.0	
10.	Zinc (as Zn), mg/l	3.2	0.01	250	

\*\*\*\*\*

DOR: 20.07.2020  
DOC: 11.08.2020

*H. S. Chatterjee*

AUTHORISED SIGNATORY  
EMPLOYEE CODE: ( 6171 )

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SHR-01 (Rev. 10)

INSPECTION REPORT BHALSWA DUMPSITES		
Item		Remarks
1	<b>General Information</b>	
	a	City & Location of Dumpsite Near Bhalswa Dairy Village, Bhalswa, New Delhi
	b	Name, Designation & Contact Details of Nodal officer for Bio-mining Sh. Sh. A. K.Yadav, EE(SLF), M. No. 9717787947
	c	Stage of Bio-mining (Planned/Being Executed/Completed) Being executed
2	<b>Volume of Waste</b>	
	a	Has Contour survey of Site been done (Y/N) Yes
	b	Length (Initial-m) -
	c	Width (Initial-m) -
	d	Height (Initial-m) 54 meters ( as informed)
	e	Total Volume (Cub. Meter) 80 Lakh M <sup>3</sup> (Approx.)
3	a	<b>Characteristics of Waste</b> Has been done by NDMC
4	a	<b>Leachate characteristics</b> -
5	<b>Baseline survey</b>	
	a	Ground water analysis Has been done by NDMC, DPCC.
	b	Soil Analysis Not provided
	c	<b>Quantity of waste processed per day (TPD)</b> Average waste processing is 4500 TPD .Till 13-1-21, total 11.5 lakh ton waste has been processed.
6	<b>Process flow sheet of Bio-mining</b> Windrows -> Spraying ->Screening ->Disposal	
7	<b>Stabilization of Waste</b>	
	a	Types of Bio-mining method adopted (Tractor tiller, Trenchmethod; Cone method; Windrow, Thin Layer method) Windrows method was adopted but presently not able to prepare proper windrow due to space constraint.
	b	Machinery used for Excavating Dumpsite (Tractor Tiller etc.) Hydraulic Excavators, Tippers & JCBs
	c	Machinery used for preparing windrows (JCB etc.) Hydraulic Excavators, Tippers & JCBs
	d	Are large objects removed prior to windrow preparation Yes
	e	Are windrows turned every 4-5 days -
	f	Duration of Stabilization 4-5 days
	g	Bio-culture used Bio culture is used for stabilization of waste.
	h	Is end product stabilized (No heat/gas/leachate/Smell) Vapor were observed coming from waste being fed to trommels.

	i	Is leachate being generated from the waste	Small amount leachate generation observed in legacy waste dumpsite at the time of inspection.
	j	If yes, methodology for leachate management adopted	No leachate treatment is being done. It meets nearby drain.
8		<b>Processing of Legacy waste</b>	
		Machinery used for Processing of Legacy waste	Hydraulic Excavator, JCBs & Tippers
	a	<b>Screening</b>	
		Trommel (Number & Capacity (TPD))	19 nos. Trommels having capacity of 4500 TPD (15 are of screen size 30mm and 4 with screen size 6 mm in series) have been installed and are operational. 3 additional trommels (with screen size 30 mm) installed, but not in operation.
		Size of screens used (Mostly used 150 mm, 80 to 100 mm, 24 to 50mm, 1216 mm & 4-6)	30 mm screen size and 6 mm screen size
		Vibrating Screen (No)	No
		Electromagnet (For separating ferrous metals)	No
		Air classifier (for separating light material from heavy organic.)	Yes (Air blower)
		Disc/Star (No)	No
	b	<b>Handling</b>	
		Loader (No.)	16 nos. Excavators & 8 nos. JCBs
		Conveyor (No.)	3 Conveyors for each trommel
		Fork Lift (No.)	No
		Categories in which the waste is segregated (compost/Recyclables/RDF/C&D/Inerts etc.)	RDF, C&D, Inert materials, soil enricher (less than 6 mm fractions).
		Quantity of items which is being generated in each category	Below 30 mm fraction- approx. 60% (including under 6 mm fraction approx. 20%) RDF- approx. 30% C&D-approx. 10%
		Quantity of items being utilized of different categories	<ul style="list-style-type: none"> <li>Total 1,35,711 MT RDF is sent to Waste to Energy plant Bawana.</li> <li>Total 2,24,644 MT inerts (including 15200 T soil enricher) below 30 mm has been sent to Mukundpur primary school, Horticulture park Bhalsawa dairy, dry leachate ponds, NTPC Badarpur eco parks and low lying area near dumpsite.</li> <li>Total 17,321 MT C&amp;D waste is used in making of ramps at the dumpsite.</li> </ul>

		<ul style="list-style-type: none"> <li>• Around 25% of weight of legacy waste got reduced during stabilization.</li> <li>• Approx. 4.5 lakh MT screened fractions are dumped on- site.</li> </ul>
	Documents supporting usage of different fractions (Bio-earth/Recyclable/RDF/Other wastes)	<ul style="list-style-type: none"> <li>• Permission granted to use RDF at Waste to Energy plant is enclosed as <b>Annexure D-I</b></li> <li>• Permission granted for dumping of Inert below 30 mm at Mukundpur primaryschool, Horticulture park Bhalsawa Dairy and NTPC Badarpur low lying area is enclosed as <b>Annexure D-II</b></li> </ul>
	Analysis results of fine earth	Last analysis has been done on 26-10-20.( <b>Annexure-D- III</b> )
	Frequency of testing of bio-earth	Not yet decided
9	<b>Miscellaneous</b>	
	a Have fires being reported at the site	No fire incident during visit. As per records available, 3 no. of fire incidents have taken place in last 7 months.
	b Methodology to tackle fires	Use of C&D and fine earth/stabilization
	c Is fresh waste being dumped at the site	Yes, Fresh waste 2000-2100 TPD is being dumped at site.
	d Percentage land recovered so far	As informed, one mound of 11 m height at the top covering 14.9 acre of area has been cleared.( <b>Annexure-D-IV</b> )
	e Is third party audit of bio-mining being done	No
10	<b>Other observations</b>	<ol style="list-style-type: none"> <li>1. Testing of the screened fractions is not being done on continuous basis. Last testing of below 30 mm fraction has been done in Feb.,2020, below 6 mm fraction testing done in Oct,2020 and RDF testing has not been done.</li> <li>2. As per testing of below 6 mm fraction, the fraction does not comply with most of the parameters (namely TOC, N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O<sub>5</sub>, density, moisture content, Cr &amp; Ni)</li> <li>3. Approx.4.5 Lakh ton screened fractions dumped on site are causing space constraint.</li> <li>4. Proper housekeeping is not maintained at site.</li> </ol>
11	Name & Designation of Inspecting Officer	P Agarwal, Scientist-E
12	Date of Inspection	14.01.2021

/N  
उत्तरी दिल्ली नगर निगम

**Subject:** Regarding removal of Combustible Waste/ RDF recovered from biomining process at Bhalswa dumpsite.

In compliance to order dated 17.07.2019 of Hon'ble NGT in OA No 386/19 & OA No. 519/19, the bio-mining of legacy waste was started at Bhalswa dump site on 01.10.2019. There is huge accumulation of combustible waste/ refuse derived fuel (RDF) recovered from biomining process at the site which is hindering normal functioning of biomining process which can eventually lead to discontinuation of biomining work.

Hence, tenders were thrice invited for disposal of combustible waste/RDF recovered from biomining of legacy waste. No response was received on first call. Since single bid of exorbitantly high rate was received on second call, the case was closed. Tenders were invited for the third time vide NIT No. EE(SpPr)RZ/TC/2019-20/08 Dated: 03.1.2020 and finally four agencies were empanelled to lift 15050 MT of RDF @ Rs.3250/- MT. In meanwhile, M/s Shakti Plastic Industries was issued consent letter on 21.02.2020 initially for one year with respect to their request letter dated 14.02.2020 for free of cost removal of 500 MT or more of Plastic/Multi Layered Plastic/RDF per month. The details of combustible waste removed by the aforementioned agencies till 4.4.2020 are as under:-

N.D.M.C.

SN	Agency	Qty of combustible waste removed(in MT)
1	M/s Pragati Builders	1636.685
2	M/s Daya Charan	175.980
3	M/s R R Enterprises	NIL
4	M/s Sai Enterprises	NIL
5	M/s Shakti Enterprises	276.750
	Total	2089.415

As per condition 32.1 of the tender for "Empanelment of contractors for removal of RDF recovered from biomining process at Bhalswa dump site in Delhi(NIT No. 08 Dt:-03.1.2020)", the Commissioner North DMC at any stage can foreclose the contract without assigning any reason thereof and the same shall be binding on the empanelled contractors. Of late, a letter no. DMSWSL/North DMC/Spl 03/2020 Dated: 01.04.2020 has been received from Delhi MSW Solutions Ltd. (placed opposite in the file) wherein they have offered to remove the combustible waste @ prevailing tipping fee. However, foreclosure of contract is not contemplated as about 50,000 MT of combustible waste is still lying at the site and hindering in normal functioning of biomining and such a large stock of combustible waste is a potential threat to life & property if catches fire. Besides M/s DMSWSL has also not revealed the quantity of combustible waste which they can remove from Bhalswa dumpsite.

The Delhi MSW Solutions Ltd. in their letter has stated that they agree to collect, transport segregated fraction i.e., RDF including the disposal of ash for further processing and disposal of the same in the scientific/ engineered facility on the following terms:-

1. North DMC will bear the cost of entire activity at the prevailing tipping fee of Rs. 1807.74 per MT as per the concession agreement dated 17<sup>th</sup> July 2009.
2. The quantity of the segregated fraction that can be consumed per day will be optimal to start with, in view of the obligations of the current volume of solid waste management.

It may be pertinent to mention the following provisions of Concession Agreement dated: 17.07.2009 in the instant context:-

- "1.6 All the types of wastes shall be cleared by the successful bidder from the Concession Area assigned for the work.
- 1.3.1 Wherever (e.g.,market, public street, parks etc)/ Whenever prescribed(festivals, event, seasons,etc. at any point of time during concession period) collection and transportation of MSW will have to be carried out by the contractor at no additional charge."

The Bhalswa dumpsite is situated in the concession area of M/s DMSWSL and M/s DMSWSL is obligated to remove all type of wastes at prevailing tipping fee in terms of above conditions. The offer of M/s Delhi MSW Solutions Ltd. to undertake the same work @ Rs. 1807.74 per MT is quite reasonable in comparison to rate of empanelment i.e., Rs 3250/- per MT.

In view of exigency of clearing the site from combustible waste, the approval is solicited for issuing consent letter to M/s DMSWSL for allowing them to remove Combustible Waste /RDF recovered from biomining process from Bhalswa dump site @ Rs. 1807.74 per MT and all terms and conditions of concession agreement dated: 17.7.2009 shall be applicable.

*[Handwritten signatures and dates]*  
EE(SpPr) RZD 4.04.2020  
SE (DEMS) 4.4.2020  
CEIT  
D-in-C  
Addl Cm (DEMS) 4/4/2020  
Commissioner 4/4/2020

*[Handwritten signature]*  
A.E./SLF 04/04/2020

1/N  
उत्तरी दिल्ली नगर निगम

**Sub:- Dumping of inerts arising out of processing of legacy waste at Bhalswa dump site.**

The I.A. No. 665/2019 & I.A. No. 625/2019 in original Application No.519/2019 filed jointly by the North, East and South Delhi Municipal Corporations for directions to the Government of India and the Government of Delhi for allowing use of 'Bhati Mines' for dumping of garbage material was listed on 22.10.2019 before the Hon'ble National Green Tribunal whereby both the applications were dismissed (page 3/C & 4/C). The North DMC, at the moment, cannot dump the inert material arising out of processing of legacy waste at Bhalswa dump site to 'Bhati Mines' since the permission has yet not been granted by the Forest Department. However, the inert material is accumulating day by day at Bhalswa dump site and as such an alternative site needs to be explored for dumping of inert material till some long-term feasible solution for dumping of inert material is available.

N.D.M.C.

A requisition bearing no. D/641/EE(Pr.)CLZ/2019-20/AE dated 05.03.2020 from EE(Pr.)CLZ has been received regarding filling the municipal processed waste being generated at SLF Bhalswa into the low lying area near Mukundpur Primary School to be used by R.P. Cell for parking purposes.

In view of above, permission is solicited to dump the inert materials recovered from processing of legacy waste at Bhalswa dump site into the low lying area near M.C. Pry School.

*R/S*  
6/3/2020  
AE

*[Signature]*  
EE(Sp.Pr.)CLZ  
05.03.2020

SE/DEMS

*[Signature]*  
6/3/2020

CE-1

D-m-c  
Addl. Comm. (DEMS)

Commissioner

*[Signature]*

733  
06-03-2020

*[Signature]*  
06-03-2020  
Sh. Tilakraj



**NORTH DELHI MUNICIPAL CORPORATION**  
Office of the Executive Engineer (Project), C.L. Zone  
Sindhora Kalan, Shakti Nagar,  
New Delhi-110052.  
Telephone No. 011 - 23654558



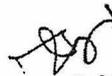
Dated: 5.3.2020

No. D/64/EE (Pr.)CLZ/2019-20/AE

**Subject : Request for supplying of processed waste for filling of low-lying area in 33 Acre land of Mukundpur near M.C. Pry. School.**

There is low-lying area in vicinity of Mukundpur near M.C. Pry. School which is required to be filled by using municipal processed waste being generated from the SLF Bhalaswa. The existing ground is filled with water and approximately 5' to 6' deep. The area is to be used by R.P. Cell for parking purposes etc.

It is, therefore, requested to arrange the filling of the said low-lying area with the processed waste as stated above.

  
EE(Pr.)/CLZ

**EE (Special Project) Rohini Zone.**

**Sub: - Regarding dumping of inerts recovered from bio mining of legacy waste at Bhalswa dump site.**

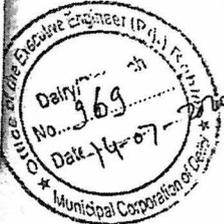
The I.A. No. 665/2019 & I.A. No. 625/2019 in original Application No.519/2019 jointly filed by the North DMC, East DMC and South DMC for seeking directions to the Government of India and the Government of Delhi for allowing use of 'Bhati Mines' for dumping of inert material was listed on 22.10.2019 before the Hon'ble National Green Tribunal whereby both the applications were. Hence the North DMC, cannot dump the inert material at 'Bhati Mines'. Subsequently, the inert material was dumped at Eco Park site of NTPC at Badarpur, low lying area adjacent to Bhalswa dumpsite and low lying area at M C Primary School, Mukundpur. However, NTPC had declined to receive inert material at their Eco Park site.

However, the inert material is accumulating day by day at Bhalswa dump site and as such alternative sites are being explored for dumping of inert material till some long-term feasible solution for dumping of inert material is available.

**M.C.D.**

Of late, a letter bearing no. ADH/CLZ/2020/81 dated 02.07.2020 has been received in this office on 07.07.2020 from Horticulture Department, CL Zone wherein it has been requested to dump site/ inert material at low lying area in North DMC park opposite B-224, Bhalswa Dairy (ward 20)

In view of above, permission is solicited to dump the inert material recovered from bio mining of legacy waste at low lying area in North DMC park opposite B-224, Bhalswa Dairy (ward 20).



Sh. T. B. Singh  
14.7.2020

EE(Sp.Pr)/RZ  
10.7.2020

SE/DEMS  
13.7.2020

CE(DEMS)

D-in-C

14/7/2020

AE  
10/7/2020

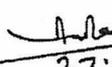
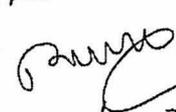
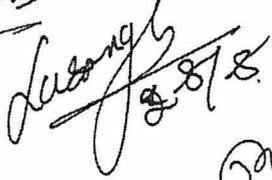
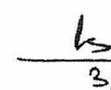
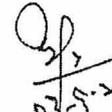


2)N

Sub: -Regarding dumping of inerts recovered from bio-mining of legacy waste at Bhalswa dumpsite.

Please refer to the letter of Assistant Director (Horticulture), Civil Line Zone bearing No. 106 dated 15.06.2020 received from EE(SLF) in person (page 2/C). In the said letter, it has been requested to dump the inert material from SLF Bhalswa to parks in front of House No. A-233 & A-47/48, Bhalswa Dairy (Ward 20).

In view of above, permission is solicited to dump the inert material recovered from bio-mining of legacy waste at low lying area in parks in front of House No. A-233 & A-47/48, Bhalswa Dairy (Ward 20).

  
 26.08.2020  
 EE(SpPr)RZ  
 SE(DEMS)   
 27.8.2020  
 CE(DEMS)  
 D-in-C  
  
 CF/DEMS   
 28/8/2020  
 SE/DEMS   
 28/8/20  
  
 31/8  
 EE (Sp Pr) RZ   
 31/8  
  
 03.9.2020  
 Sh Tilakraj TS

AE

1207/SLF  
27/8/20  
31/8/20

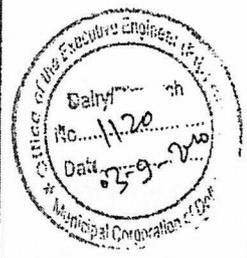
1120/EE(SpPr)RZ

26.08.2020.

254/CE/DEMS  
28/8/2020



262/CE/DEMS  
31/8/2020



उत्तरी दिल्ली नगर निगम  
उद्यान विभाग सिविल लाइन क्षेत्र

4/4

क्रमांक: स0नि0उ0 / सि ला क्षेत्र / 2020 / 106

दिनांक: 15/7/20

सविनय निवेदन यह है की भलस्वा डेरी वार्ड- 20 के अंतर्गत नकल नं०. A -233 व् A-47/48 के सामने उद्यान विभाग उत्तरी दिल्ली नगर निगम के दो पार्क है जोकि सड़क लेवल से कुछ गहरे है गहरे होने के कारण इन पार्क में बारिश का पानी भर जाता है जिसके कारण पार्क में उद्यान सम्बंधित कार्य नहीं हो पाता है कृपया इन पार्क में खल्लें में 25 - 25 गाड़ी मिट्टी (साफ़ी) डलवाने की कृपा करें। जिससे पार्क में बारिश का पानी उभर न्ना हो सके।

आपसे पुनः निवेदन है कि उपरोक्त के बारे में उचित कार्यवाही करने का कष्ट करें

  
सहायक निदेशक उद्यान  
सिविल लाइन क्षेत्र

अधिशायी अभियंता (M-L) (भलस्वा खल्लें)  
सिविल लाइन क्षेत्र

  
26/7/20  
12/7/20

1/N  
उत्तरी दिल्ली नगर निगम

**Sub:- Dumping of inerts arising out of processing of legacy waste at Bhalswa dump site.**

The I.A. No. 665/2019 & I.A. No. 625/2019 in original Application No.519/2019 filed jointly by the North, East and South Delhi Municipal Corporations for directions to the Government of India and the Government of Delhi for allowing use of 'Bhati Mines' for dumping of garbage material was listed on 22.10.2019 before the Hon'ble National Green Tribunal whereby both the applications were dismissed (page 3/C & 4/C). Hence the North DMC, at the moment, cannot dump the inert material arising out of processing of legacy waste at Bhalswa dump site to 'Bhati Mines'. However, the inert material is accumulating day by day at Bhalswa dump site and as such an alternative site needs to be explored for dumping of inert material till some long-term feasible solution for dumping of inert material is available.

N.D.M.C.

A joint inspection of North DMC's staff, Revenue Department / GNCTD's staff and surveyor was conducted for demarcation of Khasra No. 800(118-4) at Bhalswa Dump site in order to determine the extent of Khasra No. 800(118-4) within the jurisdiction of North DMC. In this connection, survey drawing & report showing demarcation of Khasra No. 800(118-4) finalized in liaison with Revenue Department GNCTD are placed opposite to the file at 1/C & 2/C.

From the survey drawing, it is revealed that a vast low lying area in between DJB pipeline abutting the PWD road and in between DJB pipeline and abutting the dump site as shown hatched in red which is a part of Khasra No. 800(118-4) and khasras adjoining Khasra No. 800(118-4) is in domain of North DMC. This low lying space can be utilized to dump the inert material arising out of processing of legacy waste at Bhalswa dump site.

In view of above, permission is solicited to dump the inert material arising out of processing of legacy waste at Bhalswa dump site at the aforementioned low lying area till some long-term viable solution is available.

*[Signature]*  
AE  
28/10/19



*[Signature]*  
30.10.19  
Sh. T. Jaiswal AE

*[Signature]*  
EE(Sp.Pr)/RZ  
28.10.19

*[Signature]*  
SE/SLE  
28.10.19

*[Signature]*  
CE-III  
29/10/19

*[Signature]*  
D-2200  
Addl. Comm (DEMS)  
29/10

*[Signature]*  
Commissioner  
30/10

*[Signature]*  
28.10.19

If approved, we may request to PWD I & F etc to use inert material in road work of T&P T&P nature. (A) above may be signed

*[Signature]*  
29/10



# SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

19, University Road, Delhi – 110007 (India)  
An ISO - 9001, 14001 & OHSAS 18001 Certified Institute  
TEST CERTIFICATE

Website : www.shriraminstitute.org  
E-mail id : customercare@shriraminstitute.org  
NO : C1/0000237523

Annen- D-II

Issued To :

Client Code : (DLH101N1355)  
NORTH DELHI MUNICIPAL CORPORATION  
O/O EE [SPECIAL PROJECT] ROHINI ZONE  
3RD FLOOR, SUB ZONAL OFFICE BUILDING  
SECTOR 17, ROHINI  
DELHI  
DELHI-110085  
Kind Attn: MR TILAK RAJ,AE

Date : 30-11-2020  
Job No : 2010-1-421-2196  
Booking No : RG2021/1/5653  
Booking Date : 16-10-2020  
Customer Ref No. : EE(SP.PR)/ROHINI/2020-21/655  
Customer Ref Dt. : 13-10-2020

**Sample Particulars:**

One sample of Inert Material recovered through Bio Mining of Legacy Waste (Passing 6 mm screen size Trommel) drawn by our representative on 26.10.2020 was received.

1. Name & address of the Site : M/s. Bhalswa Landfill Site Delhi
2. Site Representative : Mr. Tilak Raj (A.E)
3. Location of Sampling : Trommel Site SLF Bhalswa (6 mm Screen Size Trommel Machine)

S.No.	Tests	Results	Protocol/ Method of test
1.	Bulk Density, gm/cc	1.07	As per FCO Guidelines
2.	Total organic Carbon, % by mass	10.1	
3.	Total Nitrogen (as N), % by mass	0.4	
4.	Total Phosphorous (as P <sub>2</sub> O <sub>5</sub> ) % by mass	0.3	
5.	Potassium (as K <sub>2</sub> O), % by mass	0.3	
6.	C: N Ratio	16.5	

*Rohit Kumar*  
AUTHORISED SIGNATORY  
EMPLOYEE CODE:( 6095 )



# SHRIRAM INSTITUTE FOR INDUSTRIAL RESEARCH

(A unit of Shriram Scientific and Industrial Research Foundation)

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**TEST CERTIFICATE**

Website : [www.shriraminstitute.org](http://www.shriraminstitute.org)  
E-mail id : [customercare@shriraminstitute.org](mailto:customercare@shriraminstitute.org)  
NO : C1/0000237523

S.No.	Tests	Results	Protocol/ Method of test
7.	pH (1:5)	6.7	As per FCO Guidelines
8.	E. Conductivity (1:5) $\mu$ mhos/cm	1640	
9.	Moisture Content at 105°C	11	
10.	Arsenic (as As <sub>2</sub> O <sub>3</sub> ), mg/kg	3.24	
11.	Cadmium (as Cd), mg/kg	4	
12.	Chromium (as Cr), mg/kg	238	
13.	Copper (as Cu), mg/kg	226	
14.	Mercury (as Hg), mg/kg	0.01	
15.	Nickel (as Ni), mg/kg	57	
16.	Lead (as Pb), mg/kg	72	
17.	Zinc (as Zn), mg/kg	289	
18.	Selenium (as Se), mg/kg	Not Detected	
19.	Cobalt (as Co), mg/kg	12	

\*\*\*\*\*

DOR: 26.10.2020  
DOC: 30.11.2020

*Rishu Arora*  
AUTHORISED SIGNATORY  
EMPLOYEE CODE: ( 6095 )

GC-01(Rev-05)

2/2 209

Scanned copies/photocopies or any other copies should be authenticated by reference to the original report.

Phone : 91-11-27000100, 27667267, 27667860

Fax : 91-11-27667207

SRI-C1 (Rev. 03)

See overleaf for terms & conditions

104

Photo- : Google map picture of Bhalswa dumpsite indicating reduction in height of mound.



Photo at top mound where height is reduced



Email

DIVYA SINHA

---

**Re: Damage Assessment Report**

---

**From :** (Dr. G. V. Ramana) <gvramanaiitdelhi@gmail.com> Thu, Jan 28, 2021 04:22 PM  
**Subject :** Re: Damage Assessment Report  
**To :** DIVYA SINHA <divyasinha.cpcb@nic.in>  
**Cc :** Sanjeev Goyal <sk\_goyal@neeri.res.in>

The report is fine.  
Warmly  
Ramana

On Thursday, January 28, 2021, DIVYA SINHA <divyasinha.cpcb@nic.in> wrote:

---

**From:** [adhikari1996@gmail.com](mailto:adhikari1996@gmail.com)  
**To:** "DIVYA SINHA" <divyasinha.cpcb@nic.in>  
**Sent:** Thursday, January 28, 2021 3:16:03 PM  
**Subject:** Damage Assessment Report

--  
Dr. G. V. Ramana  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Delhi  
Hauz Khas, New Delhi - 110 016  
India  
Tel: 91 11 26591214 (O)  
91 11 26591551 (R)  
Fax: 91 11 26581117

---

**From :** Sanjeev Goyal <sk\_goyal@neeri.res.in>

Thu, Jan 28, 2021 03:57 PM

**Subject :** Re: Fwd: Damage Assessment Report

**To :** DIVYA SINHA <divyasinha.cpcb@nic.in>

**Cc :** gvramanaiitdelhi@gmail.com

Its fine.

S.K. Goyal

----- Original Message -----

From: DIVYA SINHA <divyasinha.cpcb@nic.in>

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Sent: Thu, 28 Jan 2021 15:35:57 +0530 (IST)

Subject: Fwd: Damage Assessment Report

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Sent: Thursday, January 28, 2021 3:16:03 PM

Subject: Damage Assessment Report

Item Nos. 08 & 09

Court No. 1

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

Original Application No. 519/2019

WITH

Original Application No. 386/2019

News item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh Titled "Below mountains of trash lie poison lakes"

With

Centre for Wildlife and Environment Litigation

Applicant

Versus

Union of India & Ors.

Respondent

Date of hearing: 16.03.2020

Date of uploading of order: 23.03.2020

**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**

**ORDER**

1. This order is being passed in continuation of order dated 19.11.2019. The issue for consideration is the disposal of 'legacy' waste dumped at Bhalswa, Ghazipur and Okhla dumpsites in Delhi where huge garbage has accumulated over the period of time adversely impacting public health and environment, which requires expeditious scientific and environmentally safe disposal as per applicable rules.
2. We may note the earlier proceedings in the matter. O.A. No. 519/2019 was taken up in view of a news item published in "The Times of India" authored by Mr. Jasjeev Gandhiok & Paras Singh and titled "Below Mountains of Trash lies Poison Lakes" reporting that the

said dumpsites were resulting in huge water contamination. The same were not being scientifically managed. The leachate was getting discharged into soil and also slipping to the River Yamuna, affecting its water quality. Accumulation of huge waste at the said sites posed a serious danger to the environment, life and public health in the area. The Solid Waste Management Rules, 2016 (SWM Rules) lay down statutory mandate for the manner of disposal of such old dumpsites but the same was not being done. Vide order dated 30.05.2019, this Tribunal directed North, East and South Delhi Municipal Corporations to furnish their respective action taken reports. The Commissioners of the said Municipal Corporations were required to remain present in person.

3. Vide order dated 17.07.2019 it was observed:-

“.....5. The action taken report of the North Delhi Municipal Corporation (North MCD) is that detailed project report (DPR) has been prepared on 08.03.2019 which has three options. One of the options is “leaving the site as it is”, which is completely out of question. Second option, bio-mining for 8.8 million cubic meter waste which is said to require a period of 15 years and cost of Rs. 1178 crores. The third option is of capping. Clause-J of Schedule-I of the SWM Rules provides for reduction of waste by bio-mining and waste processing followed by placement of residues in new landfills or capping with appropriate measures. According to the Commissioner of North MCD, closure and capping of the dumpsites, without bio-mining/bio-remediation is a better option to save money and to protect environment. The report relies upon a review of the DPR by a professor from the IIT, Delhi with regard to *Bhalswa* landfill.

6. According to the report dated 09.07.2017 of East Delhi Municipal Corporation (EDMC), it is stated that there was a proposal to utilize the inert material as filling material in the widening of national highways. Some of the dumpsite gas has been extracted and flared in association with GAIL. A pilot project was conducted for bioremediation of 100 TPD for both fresh and legacy waste. Experts were consulted in regard to slope stabilization and treatment of leachate. EDMC has started decentralized waste management processes with the help of urban development fund from the Govt. of India to the tune of Rs. 70 Crores.

7. The Counsel appearing for South Delhi Municipal Corporation (SDMC) has handed over, during the hearing, their copy of action taken report. According to the action taken report furnished by the SDMC, it consulted experts and executed some work of sterilizing the legacy waste at *Okhla Phase-I*.

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/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 Bhalsawa 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 Waste<sup>1</sup> 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.”

4. The matter was thereafter considered on 19.11.2019 in the light of report dated 13.11.2019 filed by NCT of Delhi as follows:

“6. *As per the statistics furnished during the hearing, about 1500 tones per day (TPD) of garbage is being bio-mined as against addition of more than 5000 TPD in NCT Delhi.*

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

Since the problem is continuing, there is need to increase the capacity suitably so that the garbage is cleared and land becomes available for a public purpose.

7. Since we are informed that at Bhalswa, capacity will be shortly increased to 3300 TPD. The capacity at Okhla and Ghazipur dumpsites also needs to be enhanced, the capacity for bio-mining may be further enhanced, at all the three sites. An action plan be prepared and implemented so as to clear the legacy waste in an expedited timeline but within one year as earlier directed. It needs to be ensured bio-remediation is carried out rather than mere mechanical separation. The CPCB may verify that waste clearance is as per norms and give a report. **The implementation of action plan be monitored by the Chief Secretary, Delhi. The Chief Secretary, NCT Delhi may undertake monthly monitoring of the progress and take action if there is default in terms of speed of progress. Failure to comply may result in coercive action, including stoppage of salaries and entries in ACRs of the concerned erring officers.**
8. The administrative difficulties need to be resolved at the administrative level by coordination with the concerned authorities. The urgency in the matter is also with a view to prevent air pollution and adverse health impact.

The status as on 15.01.2020 may be placed on record by 20.01.2020. A copy of this order be sent to the CPCB by email.

List for further consideration on 05.02.2020.”

5. In pursuance of the above, following reports/responses have been filed:
  - i. Report of CPCB filed on 31.01.2020 on bio-remediation of Bhalswa, Gazipur and Okhla dumpsites of Delhi in the matter of O.A No. 519 of 2019; titled news item published in "The Times of India" Authored by Jasjeev Gandhiok & Paras Singh titled "Below Mountains of Trash Lie Poison Lakes" with O.A No. 386/2019 Centre for Wildlife and Environment Litigation vs UOI & Ors.
  - ii. Compliance report on behalf of Department of Urban Development, GNCT Delhi in terms of order dated 19.11.2019 filed on 20.01.2020.

- iii. Status report regarding bio-mining/remediation of legacy waste at sanitary landfill Okhla (Dump Site) in South Delhi Municipal Corporation (SDMC) filed on 21.01.2020.
- iv. Affidavit on behalf of the respondent North Delhi Municipal Corporation (NDMC) with respect to status report filed on 30.01.2020.
- v. Affidavit filed on 13.03.2020 on behalf of the respondent North DMC with respect to status report.

6. We may consider the above seriatim.

7. The report of the CPCB, inter-alia, is as follows:

*“Table 1: Overview of the CPCB observations made during inspection of three Dumpsites in Delhi*

S. No	Name of the dumpsite	Status of legacy waste management	Quantity of legacy waste being processed (TPD)	Total quantity of legacy waste processed 14-1-2020	No. of trommels operational	Compliance to CPCB guidelines	Annexures of inspection report
1	Ghazipur	Under progress	600	25000 MT	2	Not complying	Annexure-B
2	Okhla	Under progress	250	19000 MT	1	Not complying	Annexure-C
3	Bhalsawa	Under progress	2200	65000 MT	9	Not complying	Annexure -D
Total			<b>3050 T</b>	<b>1,09,000 MT</b>	<b>12</b>		

i. **Stabilization of Waste:**

*Waste stabilization through bio-remediation is being practiced only at Okhla dumpsite. Windrow method has been adopted and bio culture is being sprayed over windrows to stabilize the waste prior to screening at this site.*

***However, fumes were being generated from waste being transferred to trommel, indicating that stabilization of waste was not complete. In the remaining two sites at Bhalsawa and Ghazipur, no waste stabilization is being done and the legacy***

waste is just being excavated and spread for 2-3 days prior to screening. No bio culture used in this process at these two sites.

ii. Screening of Waste:

The screening of waste is currently not as per the CPCB guidelines in all the three dumpsites. Only one screen size (30 mm), instead of at least 2 screen sizes (30 mm and 4-6 mm), is being used at these sites. It was observed that the under 30 mm fraction contained a lot of plastics and inerts (Photo 4c of Annexure B), which restricted its utilization for beneficial purpose, including its use as a soil enricher. A trommel of 6 mm screen size has been set up at Ghazipur site. As per the test report of the under 6 mm fraction (Photo 4d of Annexure B), the fractions complies with the limits for most of the parameters including limits specified for heavy metal, C/N ratio, Nitrogen, P2O5 and K2O specified for Organic Compost as specified in Schedule II of SWM Rules 2016. Further tests may be carried out for TOC and pH to confirm its usage as compost. It may alternatively be used as soil enricher as per CPCB Guidelines. It was informed by SDMC officials that they are also planning to install two trommels of 6 mm size.

iii. Disposal of Different Fractions:

RDF generated from Ghazipur dumpsite is being sent to Waste to Energy plant at Ghazipur. NDMC has webcasted a tender "Empanelment of contractors for removal of RDT2 recovered from bio mining process at Bhalswa dump site in Delhi" on 3<sup>rd</sup> January, 2020.

However, there is currently no plan for disposal for the remaining screened fractions, at all the three dumpsites, which are currently being dumped on — site. It is a major issue being faced at all the three dumpsites, specifically at Ghazipur site, where the screened fraction is precariously stored on berm.

iv. Proper arrangement for preparation of RDF as per MoHUA guidelines has not been made and only a fan has been provided. No process control measure implemented for improving quality of RDF. Information related to quality of RDF (moisture content/calorific value etc) for grading of RDF is not available at these sites.

v. Testing for specified parameters (RDF for calorific value parameters, moisture content etc; under 6 mm fraction for parameters specified in Schedule

**II of SWM Rules,2016) to ensure its utilization for the intended use is not done.**

**vi. The records of generation & disposal of each fraction of materials recovered from the bio-mining process is not maintained.**

**vii. Leachate was being generated, however, leachate treatment is not being carried out at any of these dumpsites.**

**viii. Fresh waste is being dumped at all the 3 dumpsites.**

**ix. The bio-remediation is being carried out in the open. No shade has been provided in the bio-remediation area in absence of which work may be hampered during rain.**

**x. Work is being executed on piece meal basis and no comprehensive time bound action plan for bio-remediation, including timeframe for clearance of dumpsite, details of machinery to be set up, utilization of screened fractions has been prepared for bioremediation of the three dumpsites.”**

8. The report of Delhi Government merely refers to the reports filed by the Municipal Corporations. The reports of Municipal Corporations have already been overseen by the CPCB. It is not necessary to make reference to the said reports individually.

9. The report of CPCB clearly shows the work being executed is inadequate in terms of quantity as well as compliance of the environmental norms. Several untenable excuses are sought to be given which can hardly be taken as justification for failure of the constitutional mandate under Article 243 W read with Schedule XII and directions of the Hon'ble Supreme Court and this Tribunal, which have been dealt with in O.A. No. 606/2018, to which Delhi Government is a party.

10. In view of the above, stand of the Municipal Corporations and Delhi Government is found to be wholly unacceptable. Coercive steps appear to be necessary for upholding the rule of law and the concern for public health.
11. We may note that the matter was earlier considered by the Hon'ble Supreme Court *inter-alia* vide judgments reported in (2000) 2 SCC 678 and (2004) 13 SCC 538 directing scientific disposal of waste by setting up of compost 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 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.

12. Further observations in the judgment of the Hon'ble Supreme Court are:

*"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 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.**

13. In this regard, reference may also be made to orders of Hon'ble Supreme Court in *Municipal Council, Ratlam vs. Vardhichand*<sup>2</sup> and *B.L. Wadhera v. Union of India and Ors.*<sup>3</sup> 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.**

14. The matter has also been considered by this Tribunal in pursuance of orders of the Hon'ble Supreme Court. This Tribunal considered the matter of solid waste management after notifying all the concerned States/Regulatory Bodies and finally disposed of the same on 22.12.2016<sup>4</sup> 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**

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<sup>2</sup> (1980) 4 SCC 162

<sup>3</sup> (1996) 2 SCC 594

<sup>4</sup> O.A. No. 199/2014 (2016) SCC Online NGT 2981

**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 RDF. Tipping fee was to include the efficient and regular monitoring of waste processing plant, segregation of inert and 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 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.**

15. Vide order dated 20.08.2018<sup>5</sup>, 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?"*

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<sup>5</sup> O.A. No. 606/2018

**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 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.

16. On 16.01.2019, in O.A. No. 606/2018, the Tribunal directed the Chief Secretary of all the States to review progress on important environmental issues and appear in person before the Tribunal. Accordingly, Chief Secretary, Delhi appeared before the Tribunal on 11.03.2019. This Tribunal passed following order:

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

- i. Steps for compliance of Rules 22 and 24 of SWM Rules be now taken within six weeks to the extent not yet taken. Similar steps be taken with regard to Bio-Medical Waste Management Rules and Plastic Waste Management Rules.*
- ii. Atleast three wards/zones/circles in each Municipal Corporation/New Delhi Municipal Council/Delhi Cantonment Board may be notified on the website within two weeks from today as model wards/zones/circles which will be made fully compliant within next six months.*

- iii. *The remaining wards/zones/circles may be made fully compliant in respect of environmental norms within one year.*
- iv. *A quarterly report be furnished by the Chief Secretary, every three months. First such report shall be furnished by June 30, 2019.*
- v. *The Chief Secretary may personally monitor the progress, atleast once in a month, with all the District Magistrates.*
- vi. *The District Magistrates or other Officers may be imparted requisite training.*
- vii. *The District Magistrates may monitor the status of compliance of environmental norms, atleast once in two weeks.*
- viii. *Performance audit of functioning of all regulatory bodies may be got conducted and remedial measures be taken, within six months.*
- 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 20 as well as any other issues discussed in the above order on 23.09.2019.”*

17. On 10.01.2020, after reviewing the earlier orders in O.A. No. 606/2018, this Tribunal directed:

**“VII. DIRECTIONS:**

36. We accordingly 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<sup>6</sup> 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 31 above will result in liability to pay compensation as already noted above.

<sup>6</sup> 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.

- 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 Secretaries of UP, Punjab and UT Chandigarh may remain present in person for further review tentatively on 24.08.2020."*

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.**

20. In view of above, we expect steps for effective implementation of the Rules failing which this Tribunal may have no option except to direct coercive action personally against the entire administrative chain in each Municipal Corporation of Delhi and NCT of Delhi who are responsible for management and supervision of municipal waste in NCT of Delhi.

21. Without prejudice to existing work being continued and expedited, taking into account the deficiencies pointed out by the CPCB, the Government of NCT Delhi may set up of an integrated Special Purpose Vehicle (SPV) for scientific management, processing and disposal of legacy waste dump sites at Ghazipur (East Delhi), Bhalswa (North Delhi ) and Okhla (South Delhi) headed by Chief Secretary, NCT of Delhi with a nominee of Lt. Governor and Commissioners of concerned Corporations, Secretary Urban Development, Delhi Govt., Shri Manish Singh, IAS (now Director Swachh Bharat, M.P., Bhopal) and Shri Vijay Nehra, IAS, Commissioner, Municipal Corporation, Ahmedabad as members with in specific time lines. The Integrated SPV may coopt other technical and administrative members as deemed necessary.
22. Let further action taken report be filed before the next date by e-mail at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in). by the Chief Secretary, Delhi.
23. CPCB may also ascertain the achievement in next two months and give its independent report.

A copy of this order be sent to all the Municipal Commissioners of the concerned Municipal Corporations, Delhi, CPCB, Urban Development Department, Delhi, Chief Secretary, Delhi, Lieutenant Governor Delhi, Shri Manish Singh, IAS, Director Swachh Bharat, M.P., Bhopal and Shri Vijay Nehra, Commissioner, Municipal Corporation, Ahmedabad by e-mail.

List again on May 27, 2020.

Adarsh Kumar Goel, CP

Sheo Kumar Singh, JM

Dr. Nagin Nanda, EM

March 23, 2020  
Original Application No. 519/2019  
With O.A. No. 386/2019  
DV

