National Inventory
of
Hazardous Wastes Generating Industries
&
Hazardous Waste Management
in
India

February 2009

Central Pollution Control Board
Hazardous Waste management Division
Delhi

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Ministry of Environment & Forests

FOREWORD

The industrialization of the country is associated with generation of large quantities of hazardous wastes which need to be properly handled and disposed to avoid contamination of soil, ground water and other components of the environment. For ascertaining the nature and extent of mitigative measures and reviewing the policies relating to hazardous wastes, the existing management practices are required to be properly inventorized on regional level, state level and national level. Effective management and handling of hazardous waste is of paramount importance for protection of human health and environment.

To enable the Authorities to control storage, transportation, treatment and disposal of hazardous wastes in an environmentally sound manner, the Ministry of Environment & Forests, Government of India, notified the Hazardous Waste (Management & Handling) Rules on July 28, 1989 under the provisions of the Environment (Protection) Act, 1986. The Rules were amended in the year 2000 and 2003 and modified as the Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules -2008 in 2008.

Recognizing its importance, Hon'ble Supreme Court of India by its order dated 14/10/2003 in the Writ Petition No. 657/95 has issued directions for management and handling of the hazardous waste and one of the direction was to prepare an inventory of hazardous waste by every State Pollution Control Board. Following this, Central Pollution Control Board directed the State Pollution Control Boards (SPCBs) / Pollution Control Committees (PCCs) to prepare and submit the inventory of hazardous waste generating industries in their State / jurisdiction so that national inventory could be prepared.

The report is based on information provided by SPCBs and PCCs and pertaining to the period 2007-08. My colleagues Sh. N.K. Gupta, Environmental Engineer, Sh. H.K. Karforma, Sr. Environmental Engineer, Sh. J.C. Babu, Environmental Engineer Mrs. Vineeta, J.S.A. and Sh. A.K. Tripathi, S.S.A. were involved in interaction with the SPCBs/ PCCs, compilation of the data and preparation of the report under the guidance of Sh. J.S. Kamyotra, Member Secretary. Efforts of SPCBs /PCCs and Zonal Offices of CPCB are also acknowledged.

Hopefully this report will be useful for the State Pollution Control Boards, regulatory bodies, hazardous waste generators, operators of the facilities and others involved in the hazardous waste management activities.

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Chapter 1
Introduction & Methodology

1.1 Introduction

The Ministry of Environment & Forests, Government of India, notified the Hazardous Waste (Management & Handling) Rules on July 28, 1989 under the provisions of the Environment (Protection) Act, 1986, which was further amended in the year 2000 and 2003 and recently The Hazardous Wastes(Management,Handling and Transboundry Movement) Rules,2008 were notified for effective management of hazardous waste (HW), mainly solids, semi-solids and other industrial wastes, which do not come under the purview of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act 1981 and also to enable the Authorities to control storage, transportation, treatment and disposal of waste in an environmentally sound manner.

The objective for introduction of such Rules is to ensure safe management of hazardous waste, generated from different industrial sources. The Rules define various categories of hazardous waste, based on the process listing (waste streams) and concentration of

hazard components. The regulatory mechanism for enforcement of the Rules is the responsibility of the State Pollution Control Boards.

Hazardous waste has been defined in Rule 3 of the Hazardous Wastes (Management, Handling and Transboundry Movement) Rules, 2008 came into force with effect from Sep. 24, 2008, as any waste, which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes or substances, and shall include:

- Wastes listed in Column 3 of Schedule-1;
- Wastes having constituents listed in Schedule-2, if their concentration is equal to or more than the limit indicated in the said schedule; and
- Wastes listed in List 'A', and 'B' of Schedule-3 (Part-A) applicable only in case(s) of import with prior informed consent and for import and export not requiring prior informed consent.

The amendments made to the Hazardous Waste (Management,Handling and Transboundry Movement) Rules, 2008 has focused attention and distinct categorization based on characterization of the waste. This necessitates re-inventorisation of the hazardous waste by the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs), which in any case is an on-going process. The new inventorisation exercise will bring out more detailed information in terms of the total quantum of waste generated vis-a-vis its composition in terms of recyclable/reusable, land-disposable and incinerable components to form the basis for planning treatment and disposal facilities to be developed. Such common facilities need to be planned based on reliable estimate of the current waste generation and projections for the future.

Reasonably reliable estimates based on process and product-wise generation of waste will facilitate planning the type of on-site and off-site storage/treatment to be provided

before disposal of waste in an environment friendly manner depending on the characteristics and quantity of waste generation.

Hon'ble Supreme Court of India by its order dated 14.10.2003 in the writ petition No. 657 / 95 has issued various directions for management and handling of the hazardous waste and one of those direction was to prepare an inventory of hazardous waste by every State Pollution Control Board. Following this in the year 2004, Central Pollution Control Board directed all the State Pollution Control Boards / Pollution Control Committees to prepare and submit the inventory of hazardous waste generating industries of their respective States / jurisdiction for preparation of national inventory.

1.2 Methodology for Preparation of National Inventory

Following methodology was adopted for preparation of the National Inventory-

- Standard formats were developed by Central Pollution Control Board and sent to all the SPCBs / PCCs for preparation of inventory of the hazardous wastes generating industries and status of hazardous waste management in the area of their jurisdiction
- The information submitted by the SPCBs / PCCs were scrutinized and sent to Zonal Offices of CPCB for cross verification by way of random checks / inspection by the teams comprising the officers of CPCB / SPCBs (or PCCS as the case may be).
- Based on the scruitinisation, random checks and observations submitted by CPCB Zonal Offices, it was realized that there is a good scope for improvement in the inventory submitted by SPCBs / PCCs. Accordingly, SPCBs / PCCs were instructed to rectify the inventory and submit it again to CPCB. For this purpose, interaction were made with SPCBs / PCCs by way of communications, visits to their offices and also in the Conferences of Member Secretaries and Chairmen.
- Based on the data submitted by 27 SPCBs and 3 PCCs , this inventory is prepared.
- The information presented in this report corresponds to the year 2007-08.

Chapter 2
Findings and Limitations

2.1 Findings

(i) In India, there are 36,165 nos. of hazardous waste generating industries, generating 62,32,507 Metric Tonnes of hazardous wastes every year. The category-wise classification of this quantity is as follows.

- Land Fillable HW – 27,28,326 MTA (Metric Tonnes/Annum)
- Incinerable HW - 4,15,794 MTA
- Recyclable HW - 30,88,387 MTA

It is obvious that the recyclable portion of HW is in the range of 49.55 % and is more than other two categories. The land disposable portion and incinerable portion are in the tune of 43.78 % and 6.67 % respectively.

(ii) Gujarat, Maharashtra and Andhra Pradesh are the top three HW generating States. The relative contributions by these States are 28.76 %, 25.16 % and 8.93 % respectively. Thereafter, Chhattisgarh (4.74 %), Rajasthan (4.38 %), West Bengal (4.17 %) and Tamil Nadu (4.15 %) are found as major generators of HW. These seven States are together generating 80.29 % of country's total HW.

(iii) In a similar way, Gujarat , Maharashtra and Andhra Pradesh are generating major quantities of *land disposable HW*. The contributions by these States with respect to country's total *land disposable HW generation* are 40.58 %, 20.83 % and 7.75 % respectively. Other major contributions are from Rajasthan (6.05 %), Tamilnadu (5.79 %), West Bengal (4.42 %), Orissa

(2.73 %) and Kerala (2.18 %). It is obvious that these eight States are generating more than 90 % of the country's total land disposable HW.

(iv) Maharashtra and Gujarat putting together, are generating 62.87 % of country' total *incinerable HW.* Their individual contributions are 36.75 % and 26.12 % respectively. Other States generating significant quantities of *incinerable HW* are Andhra Pradesh (7.61 %), Rajasthan (5.54 %), Uttar Pradesh (3.78%), Punjab (3.57 %), West Bengal (3.03 %) and Tamilnadu (2.68%) respectively. These eight States are generating 89.08 % of the country's total Incinerable HW.

(v) The major recyclable HW generating States are Maharashtra, Gujarat, Andhra Pradesh and Chhattisgarh. Their respective contributions towards country's total recyclable HW are 27.44 %, 18.68 %, 10.14 % and 9.17 %. Other States generating significant quantities of recyclable HW are Jharkhand (6.61%), Madhya Pradesh (4.14%), West Bengal (4.10%) and Uttar Pradesh (3.80%). These eight States put together generate about 84.08 % of India's total recyclable waste.

(vi) The HW generation figures quoted by Karnataka, Haryana, Delhi and Bihar appear to be on lower side.

(vii) Frequency distribution of the HW generation data of 369 districts / regions received from SPCBs / PCCs reveals the fact that 230 districts are generating HW in the range 0-2000 T/A while 108 districts generate in the range of 2001-50000 T/A. 31 districts are more critical which are producing the HW in the range 50001-467100 T/A. The frequency distribution are presented in the table below-

HW Generation Range (T/A)	Districts / Regions (Nos.)	Cumulative Nos. of Districts / Regions
0-80	119	119
81-2000	111	230
2001-50000	108	338
50001-467100	31	369

(viii) To further have the idea of the critical districts / regions, it was found that out of a total of 369 districts / regions in India, 3 districts / regions are

generating the HW in the range of 3.0-4.70 lakh MTA , 4 districts / regions are generating the HW in the range of 2.0-3.0 lakh MTA and 13 districts / regions are producing the HW in the range of 1.0-2.0 lakh MTA. 11 districts / regions are producing the HW in the tune of 0.50-1.0 lakh MTA.

(ix) Among the top 31 districts as mentioned above, 10 districts belong to Maharashtra, 8 districts to Gujarat , 5 districts to Andhra Pradsesh and 3 districts come from Chhattisgarh. Of the remaining 5, one each belongs to Jharkhand, West Bengal, Rajasthan, Madhya Pradesh and Dadra & Nagar Haveli.

(x) District –Bharuch of Gujarat has emerged as the highest generator of HW in India. It is generating the HW in the tune of 4,67,100 MTA. Districts Ahmedabad (3,60,484 MTA) and Mumbai (3,43,129 MTA) rank at 2nd and 3rd position towards generation of HW. Other districts producing major quantities of HW are Kutchh (2,60,206 MTA) , Kalyan (2,52,690 MTA), Thane (2,16,344 MTA) and Jamshedpur (2,08,813 MTA). The details in respect of top 36 districts producing HW more than 40,000 MTA are presented in the Table No 3.9.

(xi) Entire HW generation data is arranged State-wise / District-wise and presented in Tables 4.1 to 4.24.

(xii) Common Treatment, Storage and Disposal Facilities (TSDF) are developed for the disposal of land disposable HW at 22 different places in 10 States only namely Gujarat (7 Nos.), Maharashtra (4 Nos.), Uttar Pradesh (3 Nos.), Andhra Pradesh (2 Nos.), Himachal Pradesh (1 No.), Madhya Pradesh (1 No.), Punjab (1 No.), Rajasthan (1 No.),Tamil Nadu (1 No.), and West Bengal (1 No.). Total waste handling capacities (disposal capacity) of these facilities, is 15,00,568 MTA which is much less than the present generation of 27,28,326 MTA of land-disposable HW. The deficit of TSDF capacity is 12,27,758 MTA. It is obvious that additional TSDFs with waste handling capacities to the tune of 15,00,000 MTA or so must be developed to accommodate the present and future quantities of land disposable HW.

(xiii) Common TSDF located in Andhra Pradesh, Himachal Pradesh, Madhya Pradesh and Uttar Pradesh are having surplus capacities to handle the present quantities of land disposable waste generated in these respective States while the common TSDF located in Gujarat, Maharashtra, Punjab, Rajasthan, Tamilnadu and West Bengal do not have adequate capacities to accommodate the present quantities of land disposable HW. The detailed observations are presented in Tables 5.12 to 5.13.

(xiv) In a similar way, for incineration of the incinerable HW, the details of the facilities available in the country are as follows-

- Common Incinerators - 14 Nos. in 7 States
- Individual Incinerators - 127 Nos. in 12 States
- Total incineration capacity – 3,27,705 MTA
- Present generation of Incinerable waste in the country - 4,15,794 MTA
- Deficit of Incineration capacities - 88,089 MTA

It is proposed by different States to install additional incinerators to provide additional incineration capacity of 2,56,710 MTA. Above details are presented in Tables 5.14 and 5.15

(xv) Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Punjab, Pondicherry are having adequate incineration capacities (common & captive) to handle the incinerable wastes generated in the respective States. On the other hand Madhya Pradesh, Rajasthan, Uttar Pradesh, West Bengal and Daman, Diu & DNH need to augment the incineration facilities available with them to properly dispose-off the incinerable waste generated in their areas.

(xvi) The State-wise details of the existing and proposed TSDF & incinerators are presented in Tables No 5.11 to 5.16 and para 5.2.

2.2 Limitations of the Report / Estimation :

- Efforts were made by CPCB to prepare the 'National Inventory' as on April 2007 and accordingly necessary instructions were issued to the SPCBs / PCCs. It is found that the many of the SPCBs / PCCs have prepared the inventory of their area as per their convenience and above instruction were not followed. As a result, the information submitted by them correspond to different months between March 2007 and July 2008. The State-wise details on the month/year of preparation of the inventory is presented in Table No 2.21. The brief resume is as follows-

    - Inventory as on March/April 2007 – 5 SPCBs
    - Inventory as on Aug./Sept./Oct. 2007 –5 SPCBs
    - Inventory as on March/April/May/June/July 2008 –20 SPCBs /PCCs

  From the above, this may be stated that the data presented in this report are updated & latest to the extent possible.

- The data presented in this report are based on the information provided by the SPCBs / PCCs. In some cases, it is observed that the final totaling of the HW generation data made by the SPCBs is not in order. In those cases, rectification i.e. totaling of data is made at the level of the CPCB by assuming that the individual data submitted by SPCBs are in order.

- The data pertaining to Delhi may change after submission of the 'Random Check Report' to be submitted by Zonal Office – North of CPCB and in-turn rectification of the initial report if necessary, by DPCC.

- Inspite of enumerable numbers of reminders, Uttaranchal Environment Protection and & Pollution Control Board, Haryana State Pollution Control Board and Bihar Pollution Control Board have not submitted the rectified and final inventory. The data incorporated in this report in respect of these States (SPCBs) are incomplete and correspond to the year 2007.

- Attempts were made by CPCB to collect & present the scenario of the "Hazardous Waste Management" of the country in terms of many more parameters/items but the information submitted by majority of the SPCBs / PCCs were not as per the guidelines & standard formats circulated to them & discussed in the Conferences of Member Secretaries / Chairmen of SPCBs. As a result, the information particularly on industrial statistics, Authorisation granted by SPCBs, Directions issued / revoked to the industries etc., is not in a form to present the same as of national level.

Table 2.21: State-wise Month & Year corresponding to Status of HW Inventory

S.No.	Name of State/UTs,	Month & Year
1	Andhra Pradesh	March 2008
2	Assam	March 2008
3	Bihar	April 2008
4	Chhattisgarh	July 2008
5	Delhi (un-verified data)	August 2007
6	Gujarat	March 2008
7	Goa	September 2007
8	Haryana	March 2007
9	H.P.	March 2008
10	J.& K.	March 2008
11	Jharkhand	June 2008
12	Karnataka	March 2008
13	Kerala	March 2007
14	Madhya Pradesh	March 2008
15	Maharashtra	March 2008
16	Manipur	June 2008
17	Meghalaya	April 2007
18	Mizorum	June 2008
19	Nagaland	March 2008
20	Orissa	October 2007
21	Punjab	March 2008
22	Rajasthan	April 2008
23	Tripura	March 2007
24	Tamil Nadu	March 2008
25	Uttar Pradesh	September 2007
26	Uttaranchal	August 2007
27	West Bengal	April 2007
U.T.		
1	Daman, Diu, Dadra & Nagar Haveli	March 2008
2	Pondicherry	March 2008
3	Chandigarh	July 2008

Chapter 3
State-wise Hazardous Waste Generation in the Country

Industrial statistics and hazardous waste generation figures of the country are arranged in different formats and presented in the following Tables (No. 3.1 to 3.10) and Charts 3.1 to 3.21.

Table 3.1: State-wise Status of Industrial statistics

S.No.	Name of State/UTs,	Industrial Estates	Total no. of Industries	No. of HW Generating units
1	Andhra Pradesh	INA	INA	1739
2	Assam	17	52311	55
3	Bihar	34	5092	41
4	Chhattisgarh	25	INP	174
5	Delhi (un-verified data)	35	25000	1995
6	Gujarat	257	300000	7751
7	Goa	18	3503	630
8	Haryana	INP	INP	1419
9	H.P.	INP	INP	1331
10	J.& K.	12	INP	291
11	Jharkhand	INP	3384	435
12	Karnataka	INP	INP	2076
13	Kerala	137	INP	524
14	Madhya Pradesh	119	INP	1093
15	Maharashtra	225	61792	4909
16	Manipur	INP	INP	264
17	Meghalaya	8	222	43
18	Mizorum	1	2718	44
19	Nagaland	1	2037	3
20	Orissa	INP	2754	335
21	Punjab	INP	INP	3023
22	Rajasthan	INP	INP	442
23	Tripura		2520	135
24	Tamil Nadu	INP	INP	2532
25	Uttar Pradesh	138	6731	1915
26	Uttaranchal	INP	INP	70
27	West Bengal	INP	13645	609
U.T.				
1	Daman, Diu, Dadra & Nagar Haveli	INP	INP	1937
2	Pondicherry	9	2080	90
3	Chandigarh	INP	1180	260
	TOTAL	**INP**	**INP**	**36165**

Note : INP means 'Information is not provided by the SPCB/PCC.'

Table 3.2: State-wise Status of Industrial statistics
(Status of Authorisation issued to the HW Generating Industries)

S.No.	Name Of State/UTs,	No. of HW Generating units	No. of HW units applied for Authorization	No. of HW units for Which Authorization granted	No. of HW units for Which Authorization is under process
1	Andhra Pradesh	1739	INA	INA	INA
2	Assam	55	55	53	2
3	Bihar	41	INP	INP	INP
4	Chhattisgarh	174	174	174	nil
5	Delhi (un-verified)	1995	INP	INP	INP
6	Gujarat	7751	INP	INP	INP
7	Goa	630	INP	INP	INP
8	Haryana	1419	INP	INP	INP
9	H.P.	1331	1331	1331	164
10	J.& K.	291	INP	INP	INP
11	Jharkhand	435	435	435	NIL
12	Karnataka	2076			
13	Kerala	524	524	503	21
14	Madhya Pradesh	1093	1093	1093	INP
15	Maharashtra	4909	INP	4909	INP
16	Manipur	264	INP	INP	INP
17	Meghalaya	43	INP	INP	INP
18	Mizorum	44	INP	INP	INP
19	Nagaland	3	3	3	Nil
20	Orissa	335	INP	INP	INP
21	Punjab	3023	3023	2404	223
22	Rajasthan	442	INP	289	52
23	Tripura	135	116	115	1
24	Tamil Nadu	2532	INP	INP	INP
25	Uttar Pradesh	1915	1622	1339	283
26	Uttaranchal	70	63	33	30
27	West Bengal	609 (operative)	705	477	132
U.T.					
1	Daman, Diu, Dadra & Nagar Haveli	1937	INP	INP	INP
2	Pondicherry	90	INA	86	INA
3	Chandigarh	260	260	235	25
	TOTAL	**36165**	**INP**	**INP**	**INP**

Note : INP means 'Information is not provided by the SPCB/PCC.'

Table 3.3: State-wise Status of Industrial statistics
(Status of Authorisation / Directions issued to the HW Generating Industries)

S.No.	Name Of State/UTs,	No. of HW units not applied for authorization/or for renewal	No. of HW units in operation without valid authorization,	No. of HW Units for which closure directions issued since October 14,2003	No. of HW Units for which closure directions revoked since October 14,2003	No. of HW Units closed since October,2003 by your SPCB/PCC
1	Andhra Pradesh	INP	INP	INP	INP	INP
2	Assam	INP	Not identified	4	2	4
3	Bihar	INP	INP	INP	INP	INP
4	Chhattisgarh	Nil	Nil	Nil	Nil	Nil
5	Delhi (Un-verified)	INP	INP	INP	INP	INP
6	Gujarat	INP	INP	725	697	28
7	Goa	INP	INP	INP	INP	INP
8	Haryana	INP	INP	INP	INP	INP
9	H.P.	Nil	Nil	INP	INP	INP
10	J.& K.	INP	INP	INP	INP	INP
11	Jharkhand	NIL	Innv.on going	Nil	Nil	Nil
12	Karnataka	INP	INP	INP	INP	INP
13	Kerala	0	0	198	197	1
14	Madhya Pradesh	INP	INP	139	110	29
15	Maharashtra	INP	INP	INP	INP	INP
16	Manipur	INP	INP	INP	INP	INP
17	Meghalaya	INP	INP	INP	INP	INP
18	Mizorum					
19	Nagaland	Nil	Nil	Nil	Nil	Nil
20	Orissa	INP	INP	INP	INP	INP
21	Punjab	123	346	555	289	226
22	Rajasthan	INP	INP	29	5	INP
23	Tripura	19	INP	INP	INP	INP
24	Tamil Nadu	INP	INP	INP	INP	INP
25	Uttar Pradesh	86	113	199	86	113
26	Uttaranchal	7	7	2	2	1
27	West Bengal	INP	INP	135	83	52
			U.T.			
1	Daman, Diu, Dadra & Nagar Haveli	INP	INP	INP	INP	INP
2	Pondicherry					
3	Chandigarh	Nil	Nil	8	7	1
	Total	**INP**	**INP**	**INP**	**INP**	**INP**

Note : INP means 'Information is not provided by the SPCB/PCC.'

Table 3.4: State-wise Status of Hazardous Waste Generation

S. No.	Name Of State/UTs	Quantity of Hazardous waste generation (MTA)			
		Landfill able	Incinerable	Recyclable	Total
1	Andhra Pradesh	211442	31660	313217	556319
2	Assam	3252		7480	10732
3	Bihar	3357	9	73	3439
4	Chhattisgarh	5277	6897	283213	295387
5	Delhi (unverified)	3338	1740	203	5281
6	Gujarat	1107128	108622	577037	1792787
7	Goa	10763	8271	7614	26648
8	Haryana	30452	1429	4919	36800
9	H.P.	35519s	2248	4380	42147
10	J.& K.	9946	141	6867	16954
11	Jharkhand	23135	9813	204236	237184
12	Karnataka	18366	3713	54490	76569
13	Kerala	59591*	223	23085	82899*
14	Madhya Pradesh	34945	5036	127909	167890
15	Maharashtra	568135	152791	847442	1568368
16	Manipur	--	115	137	252
17	Meghalaya	19	697	6443	7159
18	Mizorum	90	Nil	12	102
19	Nagaland	61	Nil	11	72
20	Orissa	74351	4052	18427	96830
21	Punjab	13601	14831	89481	117913
22	Rajasthan	165107	23025	84739	272871
23	Tripura	0	30	237	267
24	Tamil Nadu	157909	11145	89593	258647
25	Uttar Pradesh	36370	15697	117227	169294
26	Uttaranchal	17991	580	11	18582
27	West Bengal	120598	12583	126597	259777
U.T.					
1	Daman, Diu, Dadra & NH	17219	421	56350	73990
2	Pondicherry	132	25	36235	36392
3	Chandigarh	232	--	723	955
	Total	2728326	415794	3088387	6232507

Note : * This figure of Kerala includes other wastes (8066.745 MTA) from IRE and FACT also.

Table 3.5: Relative Contribution by Different States / UTs in HW -Total Generation (Largest to Smallest)

Sl No.	State / UT	Percentage Contribution towards HW (Total) Generation	Cumulative Percentage Contribution
1	Gujarat	28.76 %	28.76 %
2	Maharashtra	25.16 %	53.92 %
3	Andhra Pradesh	8.93 %	62.85 %
4	Chhattisgarh	4.74 %	67.59 %
5	Rajasthan	4.38 %	71.97 %
6	West Bengal	4.17 %	76.14 %
7	Tamil Nadu	4.15 %	80.29 %
8	Jharkhand	3.81 %	84.10 %
9	Uttar Pradesh	2.72 %	86.82 %
10	Madhya Pradesh	2.69 %	89.51 %
11	Punjab	1.89 %	91.40 %
12	Orissa	1.56 %	92.96 %
13	Kerala	1.33 %	94.29 %
14	Karnataka	1.23 %	95.52 %
15	Daman, Diu, Dadra & NH	1.19 %	96.71 %
16	H.P.	0.68 %	97.39 %
17	Haryana	0.59 %	97.98 %
18	Pondicherry	0.58 %	98.59 %
19	Goa	0.43 %	98.99 %
20	Uttaranchal	0.30 %	99.29 %
21	J.& K.	0.27 %	99.56 %
22	Assam	0.17 %	99.73 %
23	Meghalaya	0.11 %	99.84 %
24	Delhi (unverified)	0.08 %	99.92 %
25	Bihar	0.06 %	99.98 %
26	Chandigarh	0.02 %	100.00 %
27	Tripura	Negligible	----
28	Manipur	Negligible	----
29	Mizorum	Negligible	----
30	Nagaland	Negligible	----
Total		100 %	----

Chart 3.1 : Percentage Contribution towards HW Generation by Different States / UTs (Largest to Smallest)

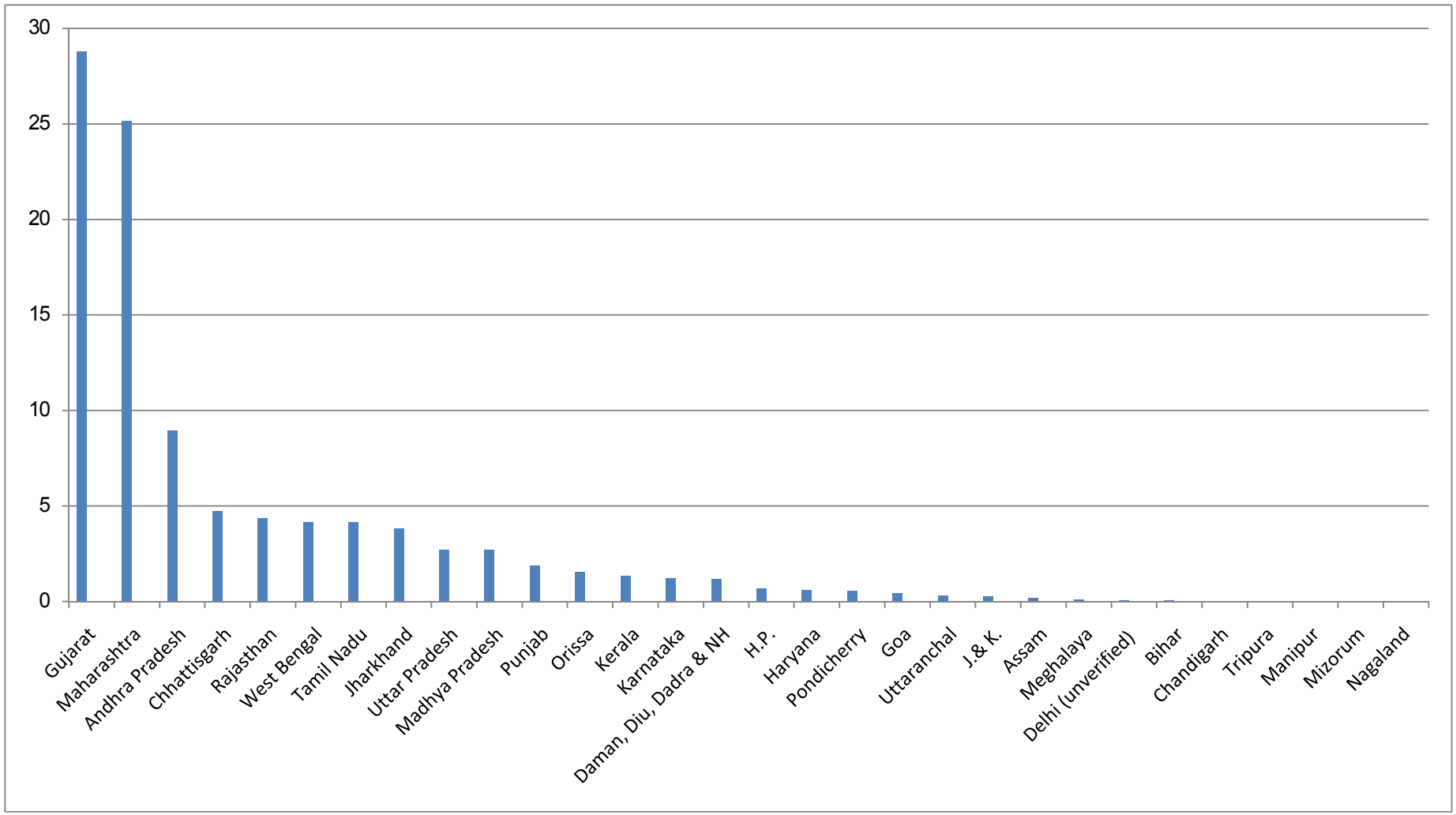


Chart 3.2 : Category wise Hazardous Waste Generation - India (2008)
Total HW Generation - 6232507 MTA

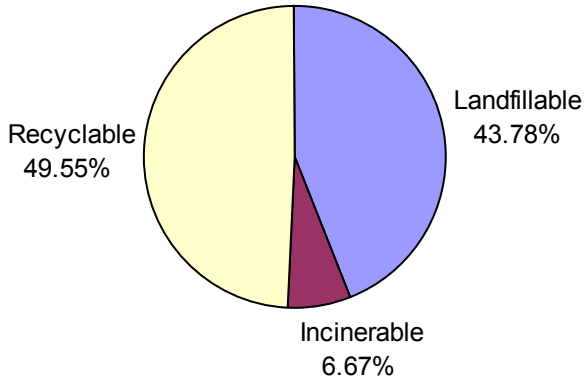


Chart 3.3: Category wise HW Generation - Gujarat (March 2008)
Total Generation - 1792787 MTA

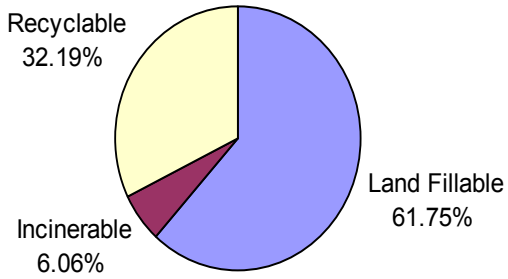


Chart-3.4: Caterory wise HW Generation-Maharashtra(March2008)
Total HW Generation-1568368 MTA

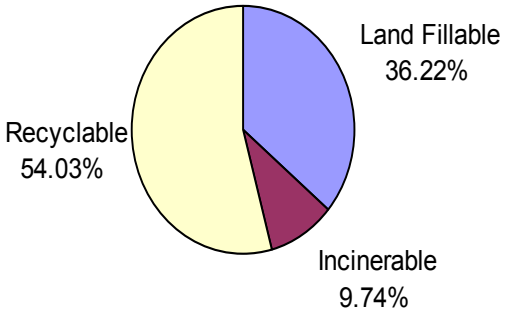


Chart-3.5:Categorywise HW Generation - Tamil Nadu (March2008)
Total HW Generation-258647 MTA

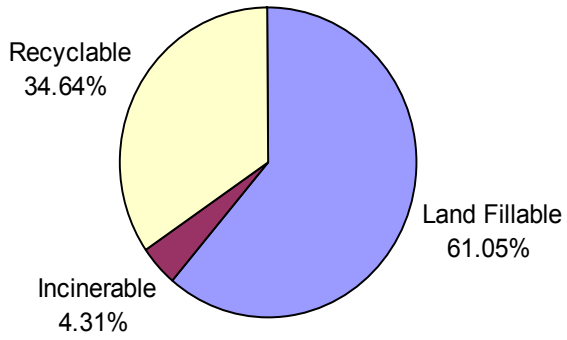


Chart-3.6:Categorywise HW Generation-Chhatisgarh(July2008)
Total HW Generation-295387 MTA

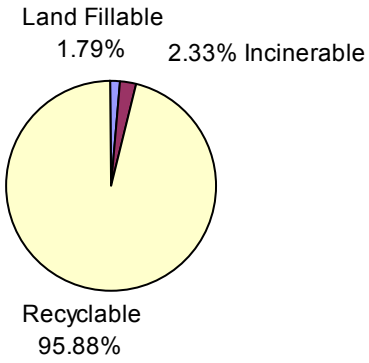


Chart-3.7:Categorywise HW Generation-Rajasthan(April2008)
Total HW Generation-272871 MTA

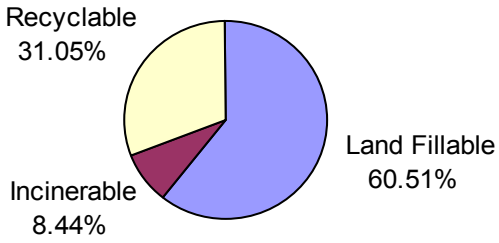


Chart-3.8:Categorywise HW Generation-West Bengal (April2007)
Total HW Generation-259777 MTA

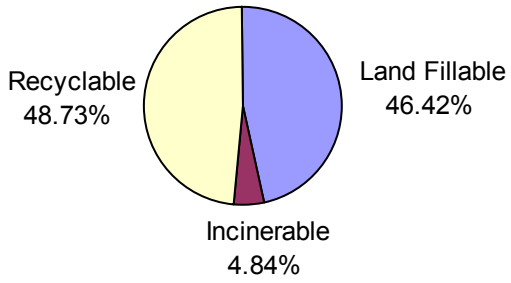


Chart3.9: Categorywise HW Generation-Jharkhand(June2008)
Total HW Generation-237184 MTA

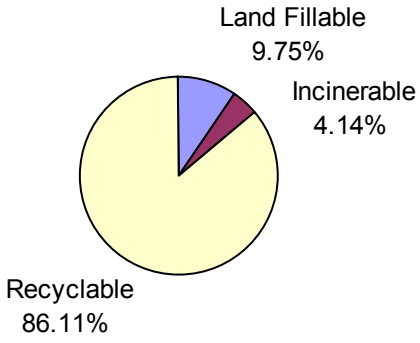


Chart3.10: Categorywise HW Generation-Uttar Pradesh(September2007)
Total HW Generation-169294 MTA

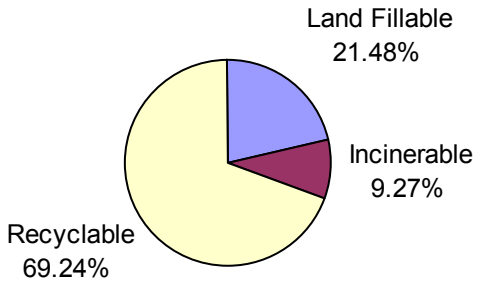


Chart3.11 Categorywise HW Generation-Madhya Pradesh(March2008)
Total HW Generation-167890 MTA

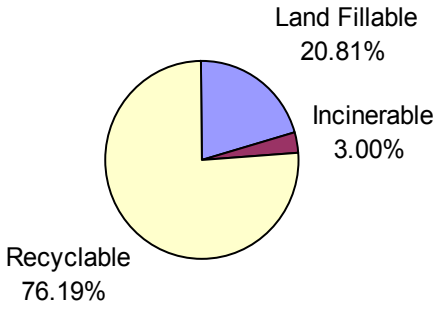


Chart3.12: Categorywise HW Generation-Punjab(March2008)
Total HW Generation-117913

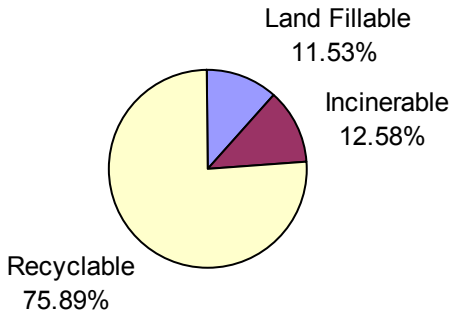


Chart3.13: Categorywise HW Generation-Orissa(October2007)
Total HW Generation-96830 MTA

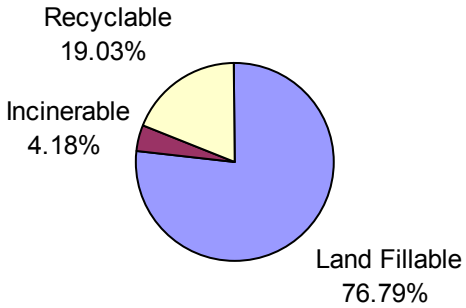


Chart3.14:Categorywise HW Generation-Kerala(March2007)
Total HW Generation-82899 MTA

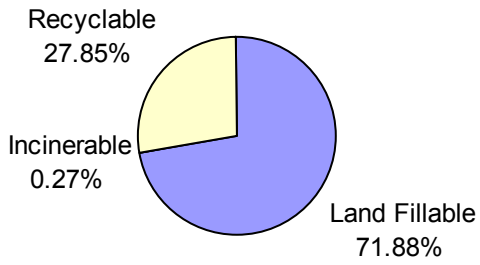
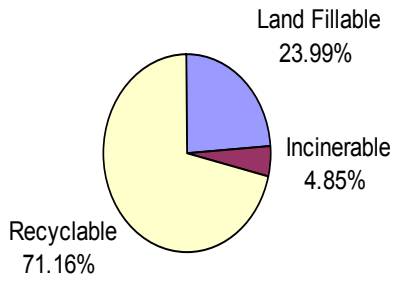
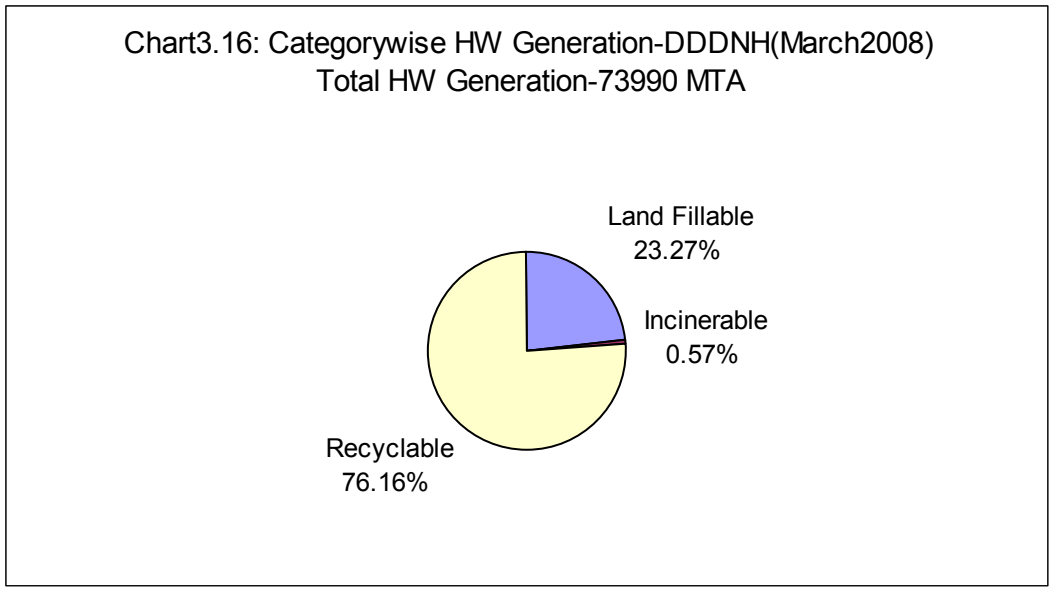


Chart3.15: Categorywise HW Generation-Karnataka(March2008) Total HW Generation-76569 MTA





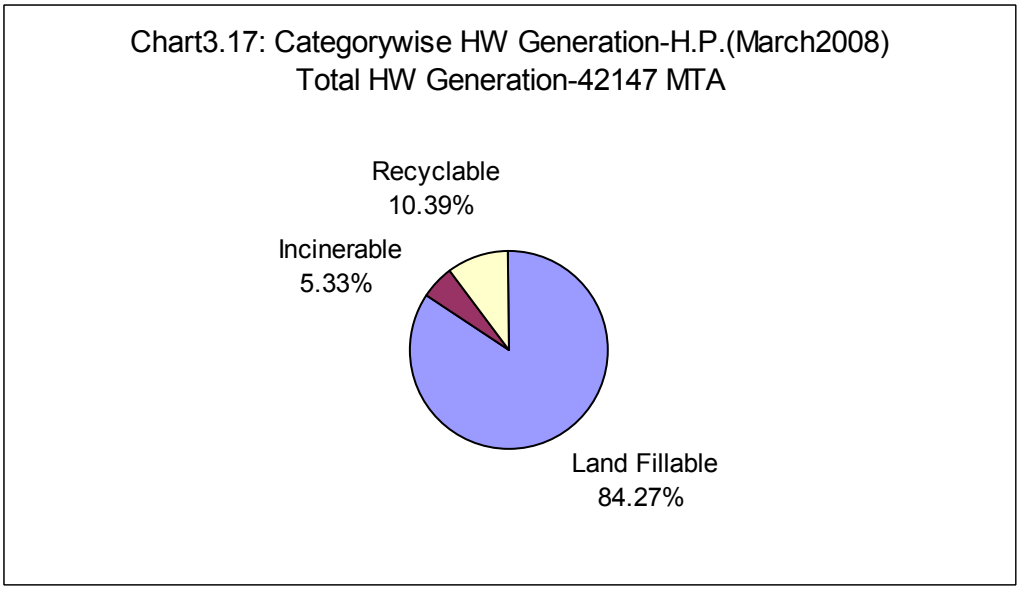


Table -3.6: Relative Contribution by Different States / UTs towards Land Disposable HW Generation (Largest to Smallest)

Sl No.	State / UT	Percentage Contribution towards Land-Disposable HW Generation	Cumulative Percentage Contribution
1	Gujarat	40.58 %	40.58 %
2	Maharashtra	20.83 %	61.41%
3	Andhra Pradesh	7.75 %	69.16%
4	Rajasthan	6.05 %	75.21%
5	Tamil Nadu	5.79 %	81.00%
6	West Bengal	4.42 %	85.42%
7	Orissa	2.73 %	88.15%
8	Kerala	2.18 %	90.33%
9	Uttar Pradesh	1.34 %	91.67%
10	H.P.	1.30 %	92.97%
11	Madhya Pradesh	1.28 %	94.25%
12	Haryana	1.12 %	95.37%
13	Jharkhand	0.85 %	96.22%
14	Karnataka	0.67 %	96.89%
15	Uttaranchal	0.66 %	97.55%
16	Daman, Diu, Dadra & NH	0.63 %	98.18%
17	Punjab	0.50 %	98.68%
18	Goa	0.40 %	99.08%
19	J.& K.	0.36 %	99.44%
20	Chhattisgarh	0.19 %	99.63%
21	Bihar	0.12 %	99.75%
22	Delhi (unverified)	0.12 %	99.87%
23	Assam	0.12 %	99.99%
24	Chandigarh	0.01 %	100.00%
25	Pondicherry	Negligible	---
26	Mizorum	Negligible	---
27	Nagaland	Negligible	---
28	Meghalaya	Negligible	---
29	Tripura	Negligible	---
30	Manipur	Negligible	---
		100	100.00 %

Chart -3.18 : Relative Contribution by Different States / UTs towards Land Disposable HW Generation (Largest to Smallest)

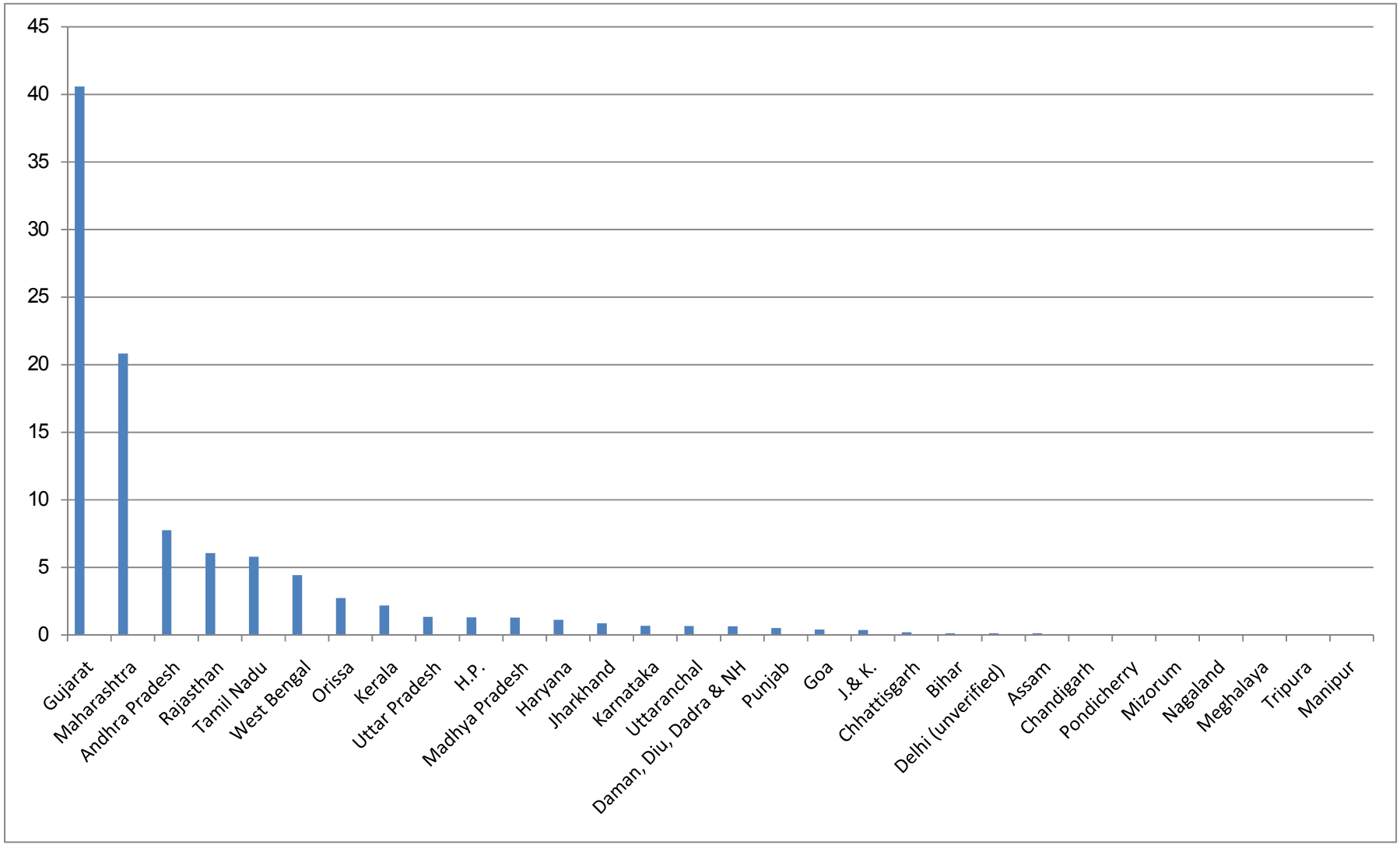


Table-3.7: Relative Contribution by Different States / UTs Towards Incinerable HW Generation
(Largest to Smallest)

Sl No.	State / UT	Percentage Contribution towards Incinerable HW Generation	Cumulative Percentage Contribution
1	Maharashtra	36.75 %	36.75 %
2	Gujarat	26.12 %	62.87 %
3	Andhra Pradesh	7.61 %	70.48 %
4	Rajasthan	5.54 %	76.02 %
5	Uttar Pradesh	3.78 %	79.80 %
6	Punjab	3.57 %	83.37 %
7	West Bengal	3.03 %	86.40 %
8	Tamil Nadu	2.68 %	89.08 %
9	Jharkhand	2.36 %	91.44 %
10	Goa	1.99 %	93.43 %
11	Chhattisgarh	1.66 %	95.09 %
12	Madhya Pradesh	1.21 %	96.30 %
13	Orissa	0.97 %	97.27 %
14	Karnataka	0.89 %	98.16 %
15	H.P.	0.54 %	98.70 %
16	Delhi (unverified)	0.42 %	99.12 %
17	Haryana	0.34 %	99.46 %
18	Meghalaya	0.17 %	99.63 %
19	Uttaranchal	0.14 %	99.77 %
20	Daman, Diu, Dadra & NH	0.10 %	99.87 %
21	Kerala	0.05 %	99.92 %
22	J.& K.	0.03 %	99.95 %
23	Manipur	0.03 %	99.98 %
24	Tripura	0.01 %	99.99 %
25	Pondicherry	0.01 %	100 %
26	Bihar	Negligible	100 %
27	Chandigarh	Negligible	100 %
28	Mizorum	Negligible	100 %
29	Nagaland	Negligible	100 %
30	Assam	Negligible	100 %
		100 %	----

Chart- 3.19 : Relative Percentage Contribution by Different States / UTs towards Incinerable HW Generation (Largest to Smallest)

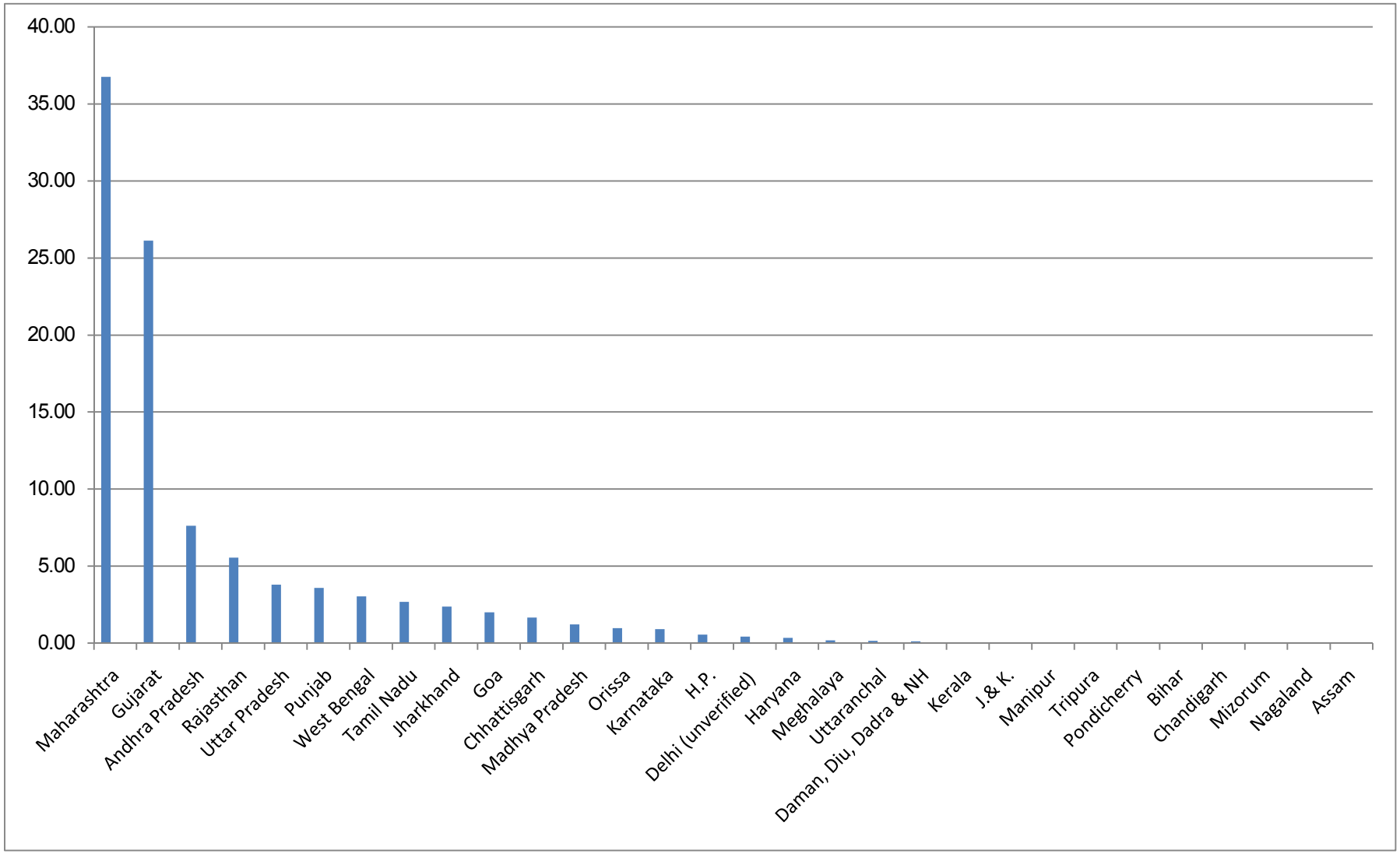


Table 3. 8: Relative Contribution by Different States / UTs towards Recyclable HW Generation
(Largest to Smallest)

Sl No.	State / UT	Percentage Contribution towards Recyclable HW Generation	Cumulative Percentage Contribution
1	Maharashtra	27.44 %	27.44 %
2	Gujarat	18.68 %	46.12 %
3	Andhra Pradesh	10.14 %	56.26 %
4	Chhattisgarh	9.17 %	65.43 %
5	Jharkhand	6.61 %	72.04 %
6	Madhya Pradesh	4.14 %	76.18 %
7	West Bengal	4.10 %	80.28 %
8	Uttar Pradesh	3.80 %	84.08 %
9	Tamil Nadu	2.90 %	86.98 %
10	Punjab	2.90 %	89.88 %
11	Rajasthan	2.74 %	92.62 %
12	Daman, Diu, Dadra & NH	1.83 %	94.45 %
13	Karnataka	1.77 %	96.22 %
14	Pondicherry	1.17 %	97.39 %
15	Kerala	0.75 %	98.14 %
16	Orissa	0.60 %	98.74 %
17	Goa	0.25 %	98.99 %
18	Assam	0.24 %	99.23 %
19	J.& K.	0.22 %	99.45 %
20	Meghalaya	0.21 %	99.66 %
21	Haryana	0.16 %	99.82 %
22	H.P.	0.14 %	99.96 %
23	Chandigarh	0.02 %	99.98 %
24	Tripura	0.01 %	99.99 %
25	Delhi (unverified)	0.01 %	100 %
26	Manipur	Negligible	100 %
27	Bihar	Negligible	100 %
28	Mizorum	Negligible	100 %
29	Nagaland	Negligible	100 %
30	Uttaranchal	Negligible	100 %
		100 %	

Chart -3.20 : Relative Contribution by Different States / UTs towards Recyclable HW Generation (Largest to Smallest)

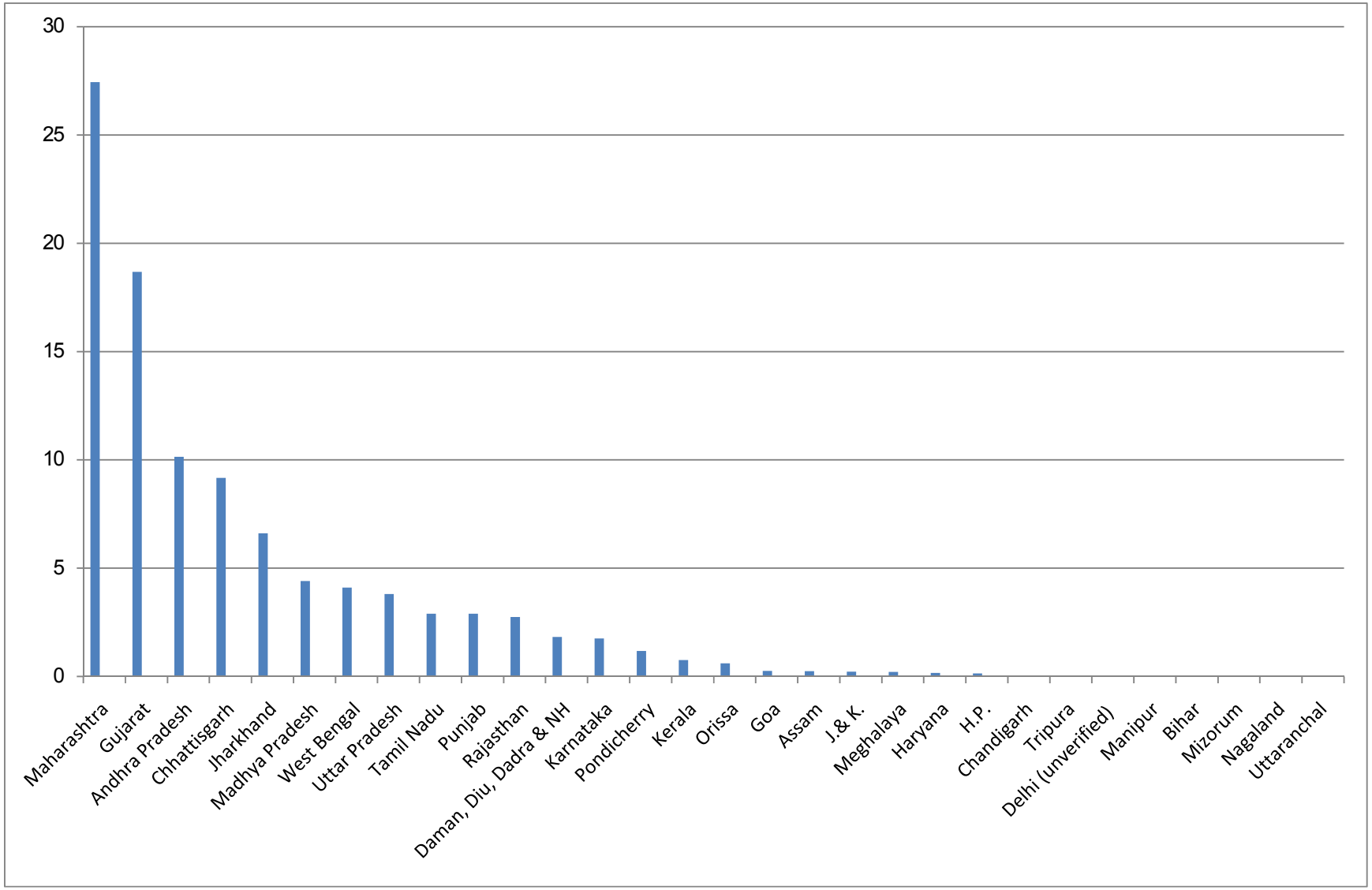


Table 3. 9: List of Districts / Regions in India Having HW Generation More than 40,000 MTA

(Largest to Smallest)

Sl. No.	District / Region	State	Hazardous Waste Generation MTA			
			Land Fillable Waste	Recyclable Waste	Incinerable Waste	Total HW
1	Bharuch	Gujarat	304345	114485	48270	467100
2	Ahmedabad	Gujarat	221832	134960	3692	360484
3	Mumbai	Maharashtra	39086	292586	11457	343129
4	Kutchh	Gujarat	217149	40154	2903	260206
5	Kalyan	Maharashtra	66411	179589	6690	252690
6	Thane	Maharashtra	123115	83142	10087	216344
7	Jamshedpur	Jharkhand	1132	198507	9174.	208813
8	Chittorgarh	Rajasthan	136390	36218	100	172708
9	Vadodara	Gujarat	51564	88901	30769	171234
10	Raigad	Maharashtra	71187	69352	25932	166471
11	Burdwan	WB	32656	106999	8358	148013
12	Valsad	Gujarat	101497	27262	6858	135617
13	Visac	AP	89534	29741	15427	134702
14	Ramchandrapuram	AP	53570	67156	13576	134302
15	karnool	AP	11996	118775	5	130776
16	Navi Mumbai	Maharashtra	59061	23636	44209	126906
17	Nagpur	Maharashtra	62245	48266	12493	123004
18	Durg	Chhattisgarh	2690	1086813	5510	116881
19	Surat	Gujarat	87456	23141	2701	113298
20	Hyderabad	AP	27125	75895	874	103894
21	Pune	Maharashtra	47653	28770	15835	92258
22	Raigad	Chhattisgarh	-	73355	-	73355
23	Non-Indust. Sources	Maharashtra	19581	51773	1628	72982
24	Dhar	MP	2464	65820	519	68803
25	Kolhapur	Maharashtra	24277	28455	12562	65294
26	Anand	Gujarat	19433	44716	116	64275
27	Dadra & N.Haveli	DDDNH	16815	46725	345	63885
28	Mehsana	Gujarat	25678	29074	1975	56727
29	Raipur	Chhattisgarh	1898	51518	1331	54747
30	Vijaywada	AP	29217	21650	1778	52645
31	Nashik	Maharashtra	20207	24365	7493	52065
32	Gandhinagar	Gujarat	38075	9723	843	48641
33	Aurangabad	Maharashtra	27972	16817	3848	48637
34	Bankura	WB	45981	8	-	45989
35	Tiruppur	TN	34852	8094	2	42948
36	Ernakulam	Kerala	14531	18718	190	41506

Chart- 3.21: List of Districts / Regions in India Having HW Generation More than 40,000 MTA (Largest to Smaller)

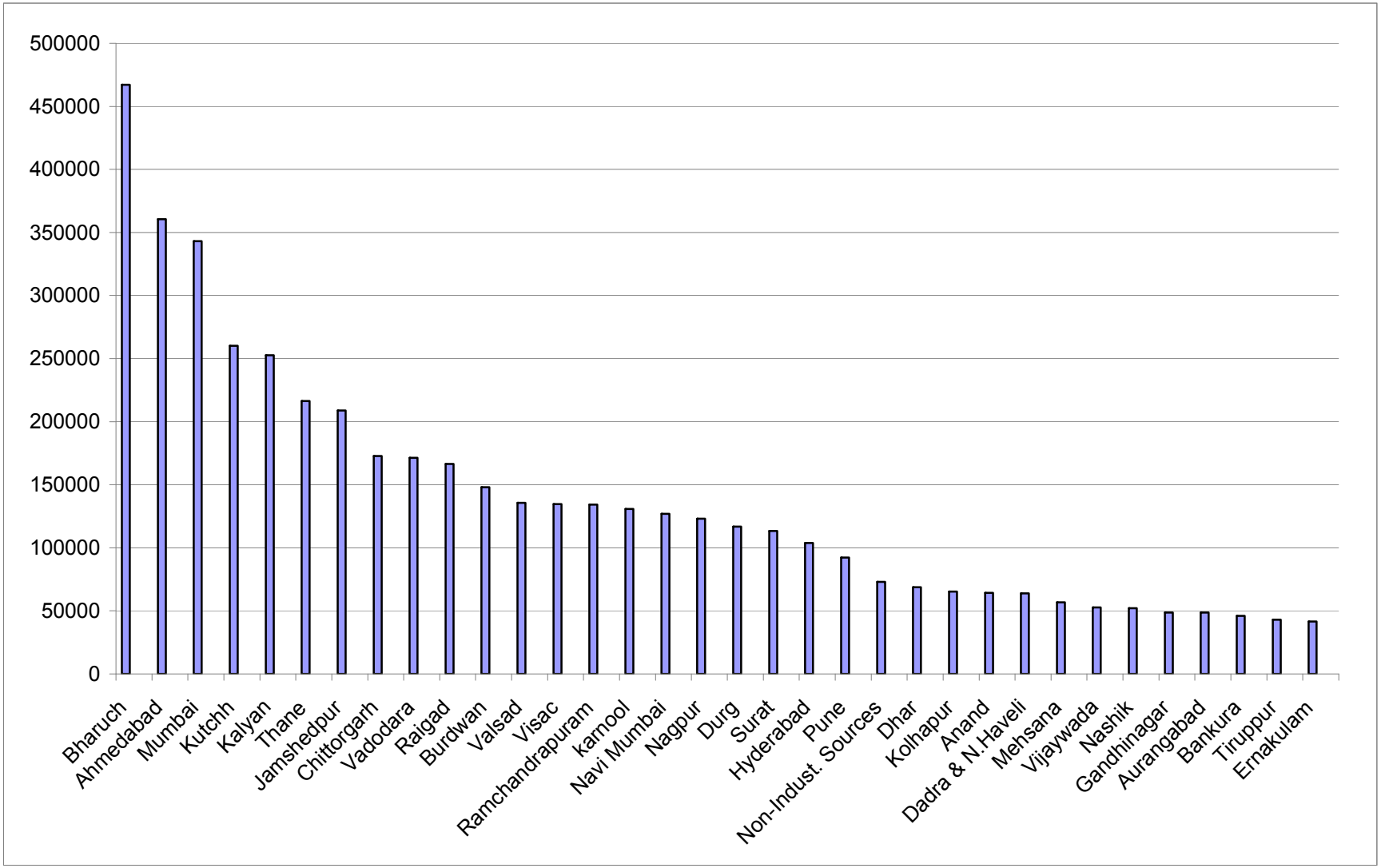


Table- 3.10: Frequency Distribution of Districts / Zones based on Hazardous Waste Generation

Sl. No.	HW Generation Range MTA	Nos. of District / Zones coming under this Range	Cumulative Nos. of District / Zones in this Range
1	Nil / Negligible	28	28
2	Up-to 10	34	62
3	11-20	16	78
4	21-30	13	91
5	31-40	10	101
6	41-50	7	108
7	51-60	5	113
8	61-70	4	117
9	71-80	2	119
10	81-90	4	123
11	91-100	3	126
12	101-125	7	133
13	126-150	2	135
14	151-175	6	141
15	176-200	2	143
16	201-300	14	157
17	301-400	9	166
18	401-500	9	175
19	501-600	14	189
20	601-700	4	193
21	701-800	7	200
22	801-900	1	201
23	901-1000	4	205
24	1001-2000	25	230
25	2001-3000	15	245
26	3001-4000	14	259
27	4001-5000	5	264
28	5001-10000	34	298
29	10001-15000	9	307
30	15001-20000	5	312
31	20001-25000	9	321
32	25001-50000	17	338
33	50001-75000	10	348
34	76001-100000	1	349
35	100001-150000	10	359
36	150001-200000	3	362
37	200001-250000	2	364
38	250001-300000	2	366
39	300001-350000	1	367
40	350001-400000	1	368
41	400001-450000	0	368
42	450001-500000	1	369

Chapter 4
District-wise / Region-wise Hazardous Waste Generation

District-wise / Region-wise figures of the hazardous waste being generated in different States are arranged in the following Tables (No. 4.1 to 4.24). Attempts are made to round-off the values of hazardous waste generation. As a result, the grand total may vary slightly in case of some of the State especially larger ones as compared to the values reported by those SPCBs. Secondly, the hazardous waste generation values quoted as zero means negligible quantities of hazardous waste generation.

Table 4.1 : Zone-wise Status of Hazardous Waste Generation in Andhra Pradesh (March 2008)

Sl. No.	Name of the Zone	No. of Hazardous Wastes Generating Industries	Type & Quantity of Hazardous Waste being Generated (MTA)			
			Disposable Waste	Recyclable Waste	Incinerable Waste	Total Waste
1	Hyderabad (Hyderabad, Karimnagar, Ranga- Reddy, Mahaboobnagar and Warangal)	413	27125	75895	874	103894
2	Ramchandrapuram (Nalgonda, Medak, Adilabad and NIzamabad)	324	53570	67156	13576	134302
3	Kurnool (Karnool, Anantpur, Chittoor and Kadappa)	175	11996	118775	5	130776
4	Vijaywada (Prakasham, Nellore, Krishna, Khammam and Guntur)	377	29217	21650	1778	52645
5	Visakhapattanam (Visac, Srikakulam, Vizianagaram, East Godavari and West Godavari)	450	89534	29741	15427	134702
Total		1739	211442	313217	31660	556319

Table 4.2: District wise Status of Hazardous Waste Generation in ASSAM
(As on March,2008)

Sl. No.	District	Recyclable (MTA)	Incinerable (MTA)	Land Disposable (MTA)	Total (MTA)
1.	Kamrup	346	Nil	56	402
2.	Sivasagar	6055	Nil	724	6779
3.	Tinsukia	177	Nil	68	245
4.	Dibrugarh	228	Nil	1800	2028
5.	Golaghat	110	Nil	93	203
6.	Morigaon	18	Nil	226	244
7.	Chirang	523	Nil	Nil	523
8.	Hailakandi	22	Nil	285	307
9.	Jorhat	1	Nil	0	1
10.	Cachar	0	Nil	Nil	0
Total		7480	Nil	3252	10732

Table 4.3: District wise Status of Hazardous Waste generation in BIHAR
(As on April 2008)

S.No.	Name of the District	Type & Quantity of Hazardous Waste being Generated (MTA)			
		Land Disposable Waste	Recyclable Waste	Incinerable waste	Total Waste
1	Begusarai	2790	8	-	2798
2	Munger	-	2	5	7
3	Bhagalpur	-	21	-	21
4	Patna	556	33	-	589
5	Muzaffarpur	10	6	0	16
6	Katihar	-	2	-	2
7	Vaishali	1	0	-	1
8	Samastipur	0	1	-	1
9	Rohtas	-	0	0	0
10	Aurangabad	-	0	0	0
11	West Champaran	-	-	2	2
12	Gopalganj	-	-	2	2
Grand Total		3357	73	9	3439

Table 4.4 : District -wise Status of Hazardous Waste Generation in Chhattisgarh (As on July 2008)

S.L.	Name of District	Type & Quantity of Hazardous Wastes being Generated MTA			
		Land Disposable Waste	Recyclable Waste	Incinerable Waste	Total
01	Dantewada	17	262	-	279
02	Bastar	34	24500	56	24590
03	Raigarh	-	73355	-	73355
04	Surguja	-	19	-	19
05	Korea	24	17	-	41
06	Bilaspur	73	1026	-	1099
07	Janjgir-Champa	5	716	-	721
08	Korba	526	22782	-	23308
09	Raipur	1898	51518	1331	54747
10	Dhamtari	7	0	-	7
11	Mahasamund	2	-	-	2
12	Durg	2690	108681	5510	116881
13	Rajnandgaon	1	336	-	337
14	Kavardha	-	1	-	1
15	Kanker	-	-	-	-
16	Jashpur	-	-	-	-
	Grant Total	5277	283213	6897	295387

Table 4.5- Region-wise Status of Hazardous Waste Generation in the UT of Daman & Diu and Dadra- Nagar Haveli (As on March 2008)

S.No.	Region	Type & Quantity of Hazardous Waste being Generated MTA			
		Land Disposable Waste	Recyclable Waste	Incinerable waste	Total Waste
1	Daman & Diu	404	9625	76	10105
2	Dadra & Nagar Haaveli	16815	46725	345	63885
	Total	17219	56350	421	73990

Table 4.6: District wise Status of Hazardous Waste Generation in – Delhi
(As on August 2007)

Sl. No.	Name of the District	Type & Quantity of Hazardous Waste being Generated (MTA)			
		Land-Disposable Waste	Recyclable Waste	Incinerable Waste	Total Waste
1	East	27	6	59	92
2	West	163	29	176	368
3	North	19	--	22	41
4	South	652	73	595	1320
5	North-east	174	6	112	292
6	North West	2051	36	458	2545
7	South West	252	21	308	581
8	New Delhi	--	4	5	9
9	Central Delhi	--	28	5	33
Total		3338	203	1740	5281

Note : District-wise / Zone-wise break up is not provided by the SPCB Goa.

Table 4.7 : District-wise Break-up of Hazardous Waste Generation - Gujarat
(As on March 2008)

Sr. No.	District	Type & Quantity of HW being Generated MTA			
		Landfillable Waste	Recyclable Waste	Incinerable Waste	Total Waste
1	Ahmedabad	221832	134960	3692	360484
2	Amreli	149	135	460	744
3	Anand	19443	44716	116	64275
4	Banaskantha	222	1369	8	1599
5	Bharuch	304345	114485	48270	467100
6	Bhavnagar	3496	31917	2738	38151
7	Dahod	1	0	0	1
8	Gandhinagar	38075	9723	843	48641
9	Jamnagar	12956	13717	199	26872
10	Junagadh	1949	1492	0	3441
11	Kheda	512	2570	829	3911
12	Kutchh	217149	40154	2903	260206
13	Mehsana	25678	29074	1975	56727
14	Narmada	13	20	0	33
15	Navsari	8434	632	265	9331
16	Panchmahal	2504	2004	5638	10146
17	Patan	56	662	52	770
18	Porbandar	1643	52	0	1695
19	Rajkot	4570	4968	123	9661
20	Sabarkantha	3003	5052	183	8238
21	Surat	87456	23141	2701	113298
22	Surendranagar	581	31	0	612
23	Vadodara	51564	88901	30769	171234
24	Valsad	101497	27262	6858	135617
	Total :	1107128	577037	108622	1792787

Table 4.8 - Region-wise Status of Hazardous Waste Generation in Himachal Pradesh
(As on March 2008)

S.No.	Name of the Area	Total Hazardous Waste Generation MTA				
		Land Disposable Waste	Recyclable Waste	Recyclable cum Incinerable waste	Others (land disposable cum Incinerable)	Total
1	RO Baddi	1259	82	163	3473	4977
2	RO Barotiwala	89	87	23	3911	4110
3	RO Nalagarh	234	104	64	1441	1843
4	RO Parwanoo	101	310	796	75	1282
5	RO Ponta Sahib	16186	520	54	4046	20806
6	RO Una	587	5	520	4103	5215
7	RO Bilaspur	6	0	13	0	19
8	RO Mandi	11	0	73	0	84
9	RO Kullu	5	4	17	0	26
10	RO Jassur	66	2	1814	371	2253
11	RO Chamba	0	0	5	1	6
12	RO Shimla	0	5	27	1440	1472
13	RO Rampur	0	0	54	0	54
Grand total		18544	1119	3623	18861	42147

Table 4.9 District-wise Status of Hazardous Waste Generation in Jammu & Kashmir
(As on March 2008)

S.No.	Location	Type & Quantity of Hazardous Waste being Generated MTA			
		Land Disposable Waste	Recyclable Waste	Incinerable waste	Total Waste
Jammu Province					
1	Ind. Complex Bari Brahmana	7546	3522	18	11086
2	Ind. Estate Gangyal & Digiana	303	1079	22	1404
3	Other areas of Jammu	119	52	0	171
4	Ind. Growth Centre Samba	28	440	68	536
5	Birpur/Other areas of Samba	3	0	2	5
6	Ind. Estate Kathua	1839	1759	6	3604
7	IID Centre Udhampur	0	0	25	25
Kashmir Province					
8	Kashmir	108	15	0	123
Total		9946	6867	141	16954

Table 4.10 : Region-wise Status of Hazardous Waste Generation in Jharkhand
(As on June 2008)

S.No.	Regional Office Name	Type & Quantity of Hazardous Waste being Generated MTA			
		Land Disposable Waste	Recyclable Waste	Incinerable Waste	Total Waste
1	Jamshedpur	1132	198507	9174	208813
2	Ranchi	21297	2704	543	24544
3	Dhanbad	704	1994	78	2776
4	Hazaribagh	0	928	0	928
5	Deoghar	2	103	18	123
	Total	23135	204236	9813	237184

Table 4.11: District-wise HW Generation in Karnataka
(As on 31st March 2008)

Sl. No.	District	Total No. of industries	Quantity of HW in MTA Disposal in landfill.	Quantity of HW in MTA Recyclable.	Quantity of HW in MTA Incinerable	Total Quantity of HW in MTA
1.	Bagalkot	27	0	50	1	51
2.	Belgaum	91	531	317	198	1046
3.	Bellary	44	216	1456	35	1707
4.	Bidar	33	383	91	72	546
5.	Bijapur	24	0	314	3	317
6.	Chamarajanagar	3	0	3	1	4
7.	Chikmagalur	9	0	333	0	333
8.	Chitradurga	32	0	71	5	76
9.	Coorg	2	0	9	0	9
10.	Davanagere	21	41	196	0	237
11.	Dharwad	58	229	489	2	720
12.	Gadag	7	1	102	0	103
13.	Gulbarga	27	0	281	0	281
14.	Hassan	23	30	487	6	523
15.	Haveri	14	15	31	3	49
16.	Karwar	20	6	849	217	1072
17.	Kolar	48	41	172	46	259
18.	Koppal	19	0	110	3	113
19.	Mandya	21	466	161	9	636
20.	Mangalore	103	1001	7063	1	8065
21.	Mysore	114	4514	20801	755	26070
22.	Raichur	20	132	152	0	284
23.	Shimoga	52	151	89	2	242
24.	Tumkur	45	8	1308	1	1317
25.	Udupi	30	6	22	0	28
26.	Bangalore City1	124	588	1749	168	2505
27.	Bangalore City-II	95	221	498	13	732
28.	BangaloreCity-III	107	505	742	6	1253
29.	Bangalore South-1	162	1366	1867	403	3636
30.	Bangalore South-II	150	1349	7242	474	9065
31.	Bangalore East-I	140	1290	1495	350	3135
32.	Bangalore East-II	54	403	168	17	588
33.	Bangalore North-I	70	486	2091	169	2746
34.	BangaloreNorth-II	57	163	615	135	913
35.	Bangalore Peenya	154	588	1073	261	1922
36.	Bangalore West	76	3636	1993	357	5986
	Total	2076	18366	54490	3713	76569

Table 4.12: District wise Hazardous Wastes Generation in Kerala

(As on March 2007)

Sl No.	District	Land fillable MTA	Recyclable MTA	Incinerable MTA	Total MTA
1	Alappuzhza	2697	380	30	3107
2	Ernakulam	14531*	18718	190	41506*
3	Idukki	0	23	0	23
4	Kannur	155	324	0	479
5	Kasargod	15	541	0	556
6	Kollam	30790	41	0	30831
7	Kottayam	27	832	0	859
8	Kozhikode	101	441	2	544
9	Malappuram	8	89	0	97
10	Palakkad	164	616	0	780
11	Pathanamthitta	34	23	0	57
12	Thiruvananthapuram	1887	738	1	2626
13	Thrissur	1114	284	0	1398
14	Wayanad	1	35	0	36
Total		59591	23085	223	82899
Note : * waste includes other categories of wastes from FACT and IRE.					

Table 4.13: Region-wise Status of Hazardous Waste Generation in Madhya Pradesh

(As on March 2008)

Sl. No.	Regional Offices	Total Generation including SLF	Reuse	Incineration	Sale (Reuse)
1	Bhopal	12199	2108	654	7653
2	Dhar	68803	30033	519	35787
3	Guna	2275	289	0	1303
4	Gwalior	3279	1418	26	274
5	Indore	6533	3206	136	1484
6	Jabalpur	23172	16268	3	4917
7	Rewa	14587	5464	15	6769
8	Sagar	156	1	0	155
9	Satna	4577	0	1226	642
10	Ujjain	32309	8428	2457	1710
Total		167890	67215	5036	60694
Land Fillable – 34945 MTA Reuse, Recyclable, Saleable – 127909 MTA Incinerable – 5036 MTA Total Generation –167890 MTA					

Table 4.14: Region wise Break-up of HW based on Disposal Method – Maharashtra (As on March 2008)

Sl.No.	Region	Quantity of HW MTA			Total Waste MTA
		Safe land Fill	Recyclable	Incinerable	
1	Navi Mumbai	59061	23636	44,209	126906
2	Pune	47653	28770	15835	92258
3	Nagpur	62245	48266	12493	123004
4	Thane	123115	83142	10087	216344
5	Aurangabad	27972	16817	3848	48637
6	Raigad	71187	69352	25932	166471
7	Kalyan	66411	179589	6690	252690
8	Nashik	20207	24365	7493	52065
9	Amravati	7340	691	557	8588
10	Kolhapur	24277	28455	12562	65294
11	Mumbai	39086	292586	11457	343129
12	Non-Industrial Sources	19581	51773	1628	72982
TOTAL		568135	847442	152791	1568368
SLF : Secured Landfill, RCL : Recyclable, INC : Incinerable					

Table 4.15: Region-wise Status of Hazardous Waste Generation in Manipur (June 2008)

S.No.	Region	Type & Quantity of Hazardous Waste being Generation in MTA			
		Land Disposable Waste	Recyclable Waste	Incinerable waste	Total Waste
1	Imphal East	Nil	17	23	40
2	Imphal West	Nil	83	83	166
3	Bishnupur	Nil	3	2	5
4	Thoubal	Nil	20	3	23
5	Senapati	Nil	4	1	5
6	Churachandpur	Nil	2	1	3
7	Tmenglong	Nil	1	1	2
8	Chandel	Nil	2	0	2
9	Ukhrul	Nil	5	1	6
	Total	Nil	137	115	252

Table 4.16: District-wise Status of Hazardous Waste Generation in Meghalaya (April 2007)

Sl. No.	District	Hazardous Waste Generation MTA			
		Landfillable	Recyclable	Incinerable	Total
1.	East Khasi Hills	--	9	--	9
2.	Jaintia Hills	--	9	--	9
3.	Ri-Bhoi District	19	6422	697	7138
4.	East Garo Hills	--	3	--	3
5.	West Garo Hills	--	--	--	--
6.	South Garo Hills	--	--	--	--
7.	West Khasi Hills	--	--	--	--
	Total	19	6443	697	7159

Note : District wise / Zonewise break up is not provided by the SPCB Mizorum. However it is informed that around 70 % of the HW generating industries are located in the State Capital Aizawl.

Table 4.17 : District wise Status of Hazardous Waste Generation in Nagaland (As on March 2008)

Sl. No.	Name of the District	Type & Quantity of Hazardous Waste being Generated (MTA)			
		Disposable Waste	Recyclable Waste	Incinerable Waste	Total Waste
1	Dimapur	--	10	--	10
2	Mon	61	1	--	62
Total		61	11	Nil	72

Table 4.18 : District wise Status of Hazardous Waste Generation in Orissa
(As on October 2007)

S.No.	Districts	Type & Quantity of Hazardous Waste being Generated MTA			
		Land Disposable Waste	Recyclable Waste	Incinerable waste	Total Waste
1	Angul	9943	9380	2168	21491
2	Balasore	2937	488	46	3471
3	Bargarh	0	23	5	28
4	Bhadrak	222	4	1	227
5	Bolangir	3	5	25	33
6	Cuttack	822	82	58	962
7	Dhenkanal	1001	1043	10	2054
8	Ganjam	3887	17	12	3916
9	Jagatsinghpur	9305	152	61	9518
10	Jajpur	9395	256	38	9689
11	Jharsuguda	266	1053	209	1528
12	Kalahandi	0	0	0	0
13	Keonjhar	1405	178	39	1622
14	Khurda	12	313	77	402
15	Koraput	3509	116	31	3656
16	Mayurbhanj	3	7	3	13
17	Nawarangpur	43	0	0	43
18	Puri	1	0	0	1
19	Rayagada	5896	36	8	5940
20	Sambalpur	2174	1913	27	4114
21	Sundargarh	23527	3361	1234	28122
	Total	74351	18427	4052	96830

Table 4.19: Region wise Break-up of HW Generation in Puducherry
(March 2008)

Sl.No.	Region	Quantity of Hazardous Waste MTA			Total
		Land Disposable	Recyclable	Incinerable	
1.	Puducherry	129	33154	23	33306
2.	Karaikal	3	63	1	67
3.	Yanam	--	3018	1	3019
4.	Mahe	--	--	--	
Total		132	36235	25	36392

Note : District-wise / Zone-wise break up is not provided by the SPCB Punjab.

Table 4.20 :District Wise Hazardous Waste Generation in Rajasthan
(As on April 2008)

S. No.	District	Hazardous Waste Disposal MTA			Total MTA
		Land Disposable	Incinerable	Recyclable	
1	Ajmer	144	-	219	363
2	Alwar	5578	66	786	6430
3	Banswara	86	120	26	232
4	Baran	0	-	-	0
5	Barmer	4661	700	33	5394
6	Bharatpur	11	-	5	16
7	Bhilwara	2	2770	4505	7277
8	Bikaner	9	-	9	18
9	Bundi	0	-	80	80
10	Chittorgarh	136390	100	36218	172708
11	Churu	-	-	-	0
12	Dausa	-	-	-	0
13	Dholpur	5	2	7	14
14	Dungarpur	25	70	60	155
15	Hanumangarh	-	-	-	0
16	Jaipur	2790	3596	914	7300
17	Jaisalmer	400	-	1	401
18	Jalore	-	-	-	0
19	Jhalawar	66	-	20	86
20	Jhunjhunu	-	-	25004	25004
21	Jodhpur	250	12104	3226	15580
22	Karauli	-	-	-	0
23	Kota	938	0	7870	8808
24	Nagaur	2	28	9	39
25	Pali	70	3000	170	3240
26	Rajsamand	1200	1	47	1248
27	S. Madhopur	-	-	0	0
28	Sikar	26	-	-	26
29	Sirohi	24	50	330	404
30	Sri Ganganaga	12	-	4	16
31	Tonk	7	110	3	120
32	Udaipur	12411	308	5193	17912
Total		165107	23025	84739	272871

Table 4.21: District-wise Break-up of HW Generation in Tamil Nadu
(As on March 2008)

Sl.No	District	No. of Industries	Quantity of HW in MTA			Total Quantity MTA
			Land fillable	Recyclable	Incinerable	
1	Chennai	96	165	533	453	1151
2	Coimbatore	110	5798	887	175	6860
3	Cuddalore	45	2504	7183	104	9791
4	Dindigul	45	556	5569	22	6147
5	Erode	364	6921	11411	0	18332
6	Hosur	83	2958	8845	280	12083
7	Kancheepuram	281	9986	12734	2584	25304
8	Kanyakumari	16	0	539	0	539
9	Karur	61	6209	188	0	6397
10	Madurai	108	1096	4665	101	5862
11	Nagapattinam	18	0	531	0	531
12	Namakkal	127	2959	1241	3	4203
13	Ooty	13	0	634	51	685
14	Pudukkottai	35	28	511	76	615
15	Salem	129	16061	714	1131	17906
16	Sivagangai	19	1022	50	0	1072
17	Thanjavur	27	2	110	0	112
18	Theni	12	1000	39	0	1039
19	Thirunelveli	43	1181	102	197	1480
20	Thiruvallur	230	7392	9214	3702	20308
21	Thiruvarur	11	0	459	0	459
22	Thoothukudi	41	30289	5876	1532	37697
23	Tiruppur	267	34852	8094	2	42948
24	Trichy	78	1179	4907	174	6260
25	Vaniyambadi	74	14809	64	0	14873
26	Vellore	109	7718	1206	447	9371
27	Villupuram	18	231	2892	10	3133
28	Virdhunagar	72	2993	395	101	3489
TOTAL		2532	157909	89593	11145	258647

Table 4.22 : District-wise Break-up of HW Generation in Tripura (March 2007)

Sl.No.	District	Quantity of Hazardous Waste MTA			Total
		Land Disposable	Recyclable	Incinerable	
1.	West Tripura	0	128	15	143
2.	Dhalai District	0	22	1	23
3.	North Tripura	0	56	8	64
4.	South Tripura	0	31	6	37
Total		0	237	30	267

Table 4.23: District-wise Break-up of HW Generation in Uttar Pradesh (September 2007)

Sl. No.	Districts	Type & Quantity of Hazardous Waste being Generation MTA			
		Land Disposable Waste	Incinerable waste	Recyclable Waste	Total Waste
1	Ghaziabad	4633	547	11301	16481
2	G.B.Nagar	1086	241	4483	5810
3	Kanpur & Kanpur Dehat	14471	499	0	14971
4	Farrukhabad	0	0	0	0
5	Kannauj	0	0	0	0
6	Allahabad	46	0	5414	5460
7	Kaushambhi	0	0	0	0
8	Sonebhadra	1021	0	5529	6550
9	Mirzapur	697	0	2112	2809
10	Fatehpur	860	0	19844	20704
11	Jhansi	91	10	69	170
12	Lalitpur	20	0	0	20
13	Hamirpur	44	0	8	52
14	Banda	0	0	0	0
15	Mahoba	0	0	0	0
16	Chitrakoot	0	0	0	0
17	Jalaon	7	10	9	26
18	Meerut	370	773	6917	8060
19	Baghpat	40	2	0	42
20	Saharanpur	878	16	23000	23894
21	Muzaffarnagar	2162	27	34900	37089
22	Aligarh	15	1	0	16
23	Bulandshahar	483	10	53	546
24	Etah	0	2	0	2
25	Mainpuri	0	0	0	0
26	Agra	252	0	62	314
27	Firozabad	6	0	748	754
28	Etawah	0	0	0	0
29	Auraiya	1992	0	48	2040
30	Hathras	24	0	62	86
31	Mathura	161	208	3	372
32	Lucknow	1419	0	0	1419
33	Barabanki	12	335	0	347
34	Hardoi	5	27	0	32

35	Lakhimpur Kheri	0	56	0	56
36	Sitapur	451	49	0	500
37	Unnao	2455	0	0	2455
38	Barielly	18	94	28	140
39	shahjahanpur	284	186	0	470
40	Pilibhit	30	56	0	86
41	Badaun	6	525	0	531
42	Varanasi	9	0	6	15
43	St.Ravidas Ngr	63	0	4	67
44	Jaunpur	31	1	0	32
45	Ghajipur	0	0	200	200
46	Chandauli	30	0	0	30
47	Ajamgarh	0	2	0	2
48	Ballia	1	2	0	3
49	Mau	0	4	0	4
50	Faizabad	0	16	0	16
51	Baharaich	0	16	0	16
52	Srawasti	0	0	0	0
53	Gonda	1	14	2	17
54	Balrampur	0	30	0	30
55	Ambedkar Nagar	0	12	31	43
56	Raebareli	1	1885	593	2479
57	Sultanpur	17	1	73	91
58	Pratapgarh	0	0	0	0
59	Gorakhpur	485	484	53	1022
60	Maharajganj	0	15	0	15
61	Basti	0	29	0	29
62	Deoria	0	16	482	498
63	Kushi Nagar	0	30	8	38
64	Sant Kabir Nagar	0	0	300	300
65	Siddharth Nagar	0	0	0	0
66	Bijnor	126	27	10	163
67	Jyotibaphule Nagar	1490	9423	324	11237
68	Moradabad	74	13	450	537
69	Rampur	3	3	101	107
Total		36370	15697	117227	169294

Table 4.24: District-wise Break-up of HW Generation in West Bengal
(As on April 2007)

Sl. No.	Districts	Type & Quantity of Hazardous Waste being Generated MTA			
		Land Disposable Waste	Recyclable Waste	Incinerable waste	Total Waste
1	24 Pgs (N)	776	7500	28	776
2	24Pgs (S)	24301	1407	67	24301
3	Bankura	45981	8	-	45981
4	Birbhum	3	1	-	3
5	Burdwan	32656	106999	8358	32656
6	Cooch-behar	-	4	-	-
7	E.Midnapore	4901	990	2247	4901
8	Hooghly	7329	551	333	7329
9	Howrah	2287	7324	258	2287
10	Jalpaiguri	150	18	79	150
11	Kolkata	572	1132	683	572
12	Malda	-	-	11	-
13	Murshidabad	-	180	-	-
14	Nadia	511	251	216	511
15	North Dinajpur	-	-	1	-
16	Purulia	-	45	-	-
17	W.Midnapore	1131	186	302	1131
	Total	120598	126596	12583	259777

Chapter 5
Treatment , Storage and Disposal facilities

5.1 Treatment and Disposal Facilities in India

Common Treatment, Storage and Disposal Facilities (TSDF) are developed for the disposal of land disposable HW at 22 different places in 10 States only namely Gujarat, Maharashtra, Uttar Pradesh, Andhra Pradesh, Himachal Pradesh, Madhya Pradesh, West Bengal, Punjab, Rajasthan and Tamil Nadu. Total disposal capacity of these facilities, is 15,00,568 MTA which is much less than the present generation of 27,28,326 MTA of land-disposable HW. The deficit of TSDF capacity is 12,27,758 MTA. It is obvious that the additional TSDF to the tune of 15,00,000 T/A must be developed to accommodate the present and future quantities of land disposable HW.

In a similar way, for incineration of the Incinerable HW, 14 Nos. of Common Incinerators in 7 States and 127 Nos. of individual incinerators in 12 States are installed. Total incineration capacity of these incinerators is 3,27,705 MTA while the present generation of Incinerable HW is 4,15,794 MTA. It is clear that there is a deficit of 88,089 MTA of incineration capacity of the country. It is proposed by different States to install additional incinerators to provide an additional incineration capacity of 2,56,710 MTA. Above details are presented in the following Tables (No. 5.11 to 5.16).

Table 5.11 : State-wise Nos. of TSDF / Individual facilities for Management of HW (Existing TSDF / Incineration)

Sl. No.	Name of the State / UT	Existing HW Management Facilities		
		Safe Land Disposal only	Incineration only	Both (SLD and Incineration)
1	Andhra Pradesh	---	• Individual - 23 Nos.	• TSDF - 1 No. at Dundigal (Distt. Rangareddy) • TSDF - 1 No. at Parawada (Visac)
2	Assam	• Individual - 06 Nos.	Nil	Nil (No TSDF)
3	Bihar	INP	INP	INP
4	Chhattisgarh	• Individual – 02 NOs. (At BALCO and BSP)	Nil	No TSDF
5	Delhi	INP	INP	INP
6	Gujarat	• TSDF - 3 No. • Individual- 13 No.	• Individual - 37 Nos.	• TSDF - 4 Nos. • Individual - 1 No.
7	Goa	Nil	Nil	No TSDF
8	Haryana	INP	INP	INP
9	H.P.	• TSDF - 1 No.	• Individual – 7 Nos.	INP
10	J.& K.	Nil	Nil	No TSDF
11	Jharkhand	• No TSDF. • Individual facilities	• No common Incinerator. • Individual- 1 No.	No TSDF
12	Karnataka	1 at Dabaspet	• Common – 3 Nos. • Individual – 7 Nos.	Nil
13	Kerala	• TSDF at Ernakulam under construction. • Individual - 17 Nos.	• Individual – 1 No • Common – 1 No. *	Nil
14	Madhya Pradesh	• Individual - 10 Nos.	• Individual - 15 Nos.	• TSDF at Pithampur
15	Maharashtra	• 1 No. (TTWMA) at Navi Mumbai	--	• 1 TSDF at Taloja • 1 TSDF at Rajangaon (incinerator under development) • 1 TSDF at Butiborui
16	Manipur	INP	INP	INP
17	Meghalaya	Nil	Nil	Nil
18	Mizorum	INP	INP	INP
19	Nagaland	Nil	Nil	Nil
20	Orissa	• Indv.storage	Nil	Nil
21	Punjab	• TSDF at	• Individual - 17	Nil

		Nimbua, Derabassi	Nos.	
22	Rajasthan	• TSDF at Gudli, Udaipur • Individual- 12 Nos.	• No common Incinerator. • Individual - 05 Nos.	Nil
23	Tripura	Nil	• Individual - 1 No. Captive at Hapania Dumping Yard	Nil
24	Tamil Nadu	• TSDF at Gummadipoondi	Nil	Nil
25	Uttar Pradesh	• TSDF 3 Nos. at Rooma (Kanpur), Kumbhi (Kanpur Dehat) and Banthar(Unnao)	• Common – 1 No. • Individual - 13 Nos.	Nil
26	Uttaranchal	Nil	Nil	Nil
27	West Bengal	INP	• Individual - 4 Nos.	• TSDF at Haldia. (LF- 120000 MTA, Incin-20,000 MTA, Stabliz/treat.- 60,000 MTA)
	UTs :			
1	Chandigarh	Nil	Nil	NIl
2	Pondicherry	Nil	Nil	Nil
3	Daman, Diu, Dadra & Nagar Haveli	Nil	• Individual - 4 Nos. (180 MTA)	Nil

*** Installed by Kochin Economic Zone Processor ; Kochin to incinerate the Hazardous Wastes of Industries of that particular association only.**

Table 5.12 : State-wise Details of Capacities of Existing TSDF in India

Sl No.	Name/ Location of TSDF	Capacity in TPA	Design Period in Years	Total capacity	
				Tonnes	Million Tonnes
Andhra Pradesh:					
1	TSDF Dundigal	150000	30	4500000	4.5
2	TSDF, Visac	200000	25	5000000	5
Gujarat :					
3	NEIL , Nandesari, Vadodara	21667	12	260004	0.260004
4	GEPIL, Surat	100000	35	3500000	3.5
5	TSDF, Odhav, Ahmedabad	71667	15	1075005	1.075005
6	TSDF at Vatva, Ahmedabad, Gujarat	63067	15	946005	0.946005
7	BEIL, Ankleshwar	120000	22	2640000	2.64
8	TSDF, vapi	48000	25	1200000	1.2
9	TSDF, Alang	23000	15	345000	0.345
Himachal Pradesh:					
10	TSDF at Baddi	50000	20	1000000	1
Madhya Pradesh:					
11	MP Waste Management Limited, Pithampur	90000	20	1800000	1.8
Maharashtra:					
12	M/s TSDF at Taloja	120000	20	2400000	2.4
13	TSDF at New Mumbai	10000	5	50000	0.05
14	TSDF at Butibori	60000	20	1200000	1.2
15	TSDF at Ranjangaon	60000	20	1200000	1.2
Punjab :					
16	TSDF at Nimbua, Derabassi	13000	40	520000	0.52
Rajasthan:					
17	TSDF at Gudli, Udaipur	20000	25	500000	0.5
Tamilnadu:					
18	TSDF at Gummadipoondi	100000	30	3000000	3
Uttar Pradesh :					
19	TSDF, Kumbhi, kanpur Dehat	17500	20	350000	0.35
20	TSDF at Banthar, Unnao	20667	15	310000	0.31
21	TSDF at Rooma, kanpur	22000	1	22000	0.022
West Bengal:					
22	TSDF, Purba Shrikrishnapur, East Midnapur	120000	30	3600000	3.6
Total		1500568		35418014	35
Present Generation		2728326			
Deficit of accommodating capacity		1227758 MTA i.e. 1.228 Million MTA			
Note : From the above it is clear that we have the capacity to dispose-off 1.50 Million Tonnes /year but we are generating 2.73 Million Tonnes/ year. Hence we need to create additional facility of around 1.23 Million MTA.					

Table 5.13 : State-wise Existing TSDF Capacities vis-à-vis HW Generation in India

Sl No.	Name/ Location of TSDF	Capacity in TPA	Total capacity	Land Disposable HW Generation in the State	Surplus Capacity / Deficit in capacity
Andhra Pradesh:					
1	TSDF Dundigal	150000	350000	211442	138558 (Surplus)
2	TSDF, Visac	200000			
Gujarat :					
3	NEIL , Nandesari, Vadodara	21667	447401	1107128	-659727 (Deficit)
4	GEPIL, Surat	100000			
5	TSDF, Odhav, Ahmedabad	71667			
6	TSDF at Vatva, Ahmedabad	63067			
7	BEIL, Ankleshwar	120000			
8	TSDF, vapi	48000			
9	TSDF, Alang	23000			
Himachal Pradesh:					
10	TSDF at Baddi	50000	50000	35519	14481 (Surplus)
Madhya Pradesh:					
11	MP Waste Management Limited, Pithampur	90000	90000	34945	55055 (Surplus)
Maharashtra:					
12	M/s TSDF at Taloja	120000	250000	568135	-318135 (Deficit)
13	TSDF at New Mumbai	10000			
14	TSDF at Butibori	60000			
15	TSDF at Ranjangaon	60000			
Punjab :					
16	TSDF at Nimbua, Derabassi	13000	13000	13601	-601 (Deficit)
Rajasthan:					
17	TSDF at Gudli, Udaipur	20000	20000	165107	-145107 (Deficit)
Tamilnadu:					
18	TSDF at Gummadipoondi	100000	100000	157909	-57909 (Deficit)
Uttar Pradesh :					
19	TSDF, Kumbhi, kanpur Dehat	17500	60167	36370	23797 (Surplus)
20	TSDF at Banthar, Unnao	20667			
21	TSDF at Rooma, kanpur	22000			
West Bengal:					
22	TSDF, Purba Shrikrishnapur, East Midnapur	120000	120000	120598	-598 (Deficit)
G. Total		1500568	1500568	2450754	-950186 (Deficit)

Table 5.14: State-wise Status of Common & Captive Incinerators and their Capacities

S.No.	Name of State/UT	Nos. of Common hazardous Waste Incinerators	capacity in TPA	Nos. of Captive hazardous Waste Incinerators	capacity of captive Incinerators in TPA	Proposed capacity of Common/Captive HW incinerators in next two to three years	Proposed Nos. of incinerators
1	Andhra Pradesh	2 (Dundigal and Parawada)	18000	26	29823		
2	Gujarat	4 (Vadodara, Ankleshwar, Surat and valsad)	32872	35	128425	165000	
3	H.P.			7	5082		6
4	Karnataka	3 (Banglore)	5100	7	2743		
5	Kerala	1 (Kochin) *	250	1	1500		
6	Madhya Pradesh	----		7	2940	9000	
7	Maharashtra	2 (Taloja and Butibori)	30000			52560	1
8	Punjab			17	35250		2
9	Pondicherry			1	2700		
10	Rajasthan			5	15500		
11	Uttar Pradesh	1 (Ghaziabad)	1200	13	5340		
12	West Bengal	1 (Haldia)	10800	4		17650	
13	Daman, Diu, Dadra & NH			4	180	12500	
14	**Total**	**14**	**98222**	**127**	**229483**	**256710**	9
• Grand Total of capacity - 327705 TPA							
• Incinerable waste Generated- 415794 TPA							
• Deficit of Incineration capacities- 88089 TPA							

* Access is limited to a particular association members only.

Table 5.15: State-wise Status of Incineration Capacities vis-à-vis Incinerable Waste Generation

S.No.	Name of State/UT	Nos. of Common hazardous Waste Incinerators	Capacity in MTA	Nos. of Captive hazardous Waste Incinerators	Capacity of captive Incinerators in MTA	Total Capacity MTA	Incinerable Waste Generation in the State MTA	Surplus capacity
1	Andhra Pradesh	2	18000	26	29823	47823	31660	16163 (Surplus)
3	Gujarat	4	32872	35	128425	161297	108622	52675 (Surplus)
4	H.P.	-----	-----	7	5082	5082	2248	2834 (Surplus)
5	Karnataka	3	5100	7	2743	7843	3713	4130 (Surplus)
6	Kerala	1 *	250	1	1500	1750	223	1527 (Surplus)
7	Madhya Pradesh	-----	-----	7	2940	2940	5036	-2096 (Deficit)
8	Maharashtra	2	30000			30000	152791	-122791 (Deficit)
9	Punjab	-----	-----	17	35250	35250	14831	20419 (Surplus)
10	Pondicherry	-----	-----	1	2700	2700	25	2675 (Surplus)
11	Rajasthan	-----	-----	5	15500	15500	23025	-7525 (Deficit)
12	Uttar Pradesh	1	1200	13	5340	6540	15697	-9157 (Deficit)
13	West Bengal	1	10800	4		10800	12583	-1783 (Deficit)
14	Daman, Diu, Dadra & NH	-----	-----	4	180	180	421	-241 (Deficit)
	Total	14	98222	127	229483	327705	370875	-43170 (Deficit)

* Access is limited to a particular association members only.

Table 5.16: State-wise Status of Strategies Proposed (TSDF / Incineration)

Sl. No.	Name of the State / UT	Under planning HW Management Facilities		
		Safe Land Disposal only	Incineration only	Both
1	Andhra Pradesh	Nil	1 at Visac	Nil
2	Assam	Nil	Nil	Nil
3	Bihar	INP	INP	INP
4	Chhattisgarh	1 at Bhilai-Durg	Nil	Nil
5	Delhi	INP	INP	INP
6	Gujarat	---	3 Nos. at TSDF	1 at Kuchchha
7	Goa	• 2 Nos. Individual at M/s Sunrise Zinc and M/s Nicromet. • 1 No. common at Dharbandora, South Goa	Nil	Nil
8	Haryana	INP	INP	INP
9	H.P.	INP	INP	INP
10	J.& K.	Nil	Nil	Nil
11	Jharkhand	Nil	Nil	Nil
12	Karnataka	1 at Siddalgatta	Nil	Nil
13	Kerala	----	1 No. at TSDF in second phase.	--
14	Madhya Pradesh	Nil	Nil	Nil
15	Maharashtra	INP	INP	INP
16	Manipur	INP	INP	INP
17	Meghalaya	Nil	Nil	Nil
18	Mizorum	INP	INP	INP
19	Nagaland	Nil	Nil	Nil
20	Orissa	Nil	Nil	Nil
21	Punjab	Nil	Nil	Nil
22	Rajasthan	Nil	Nil	Nil
23	Tripura	Nil	Nil	Nil
24	Tamil Nadu	Nil	Nil	Nil
25	Uttar Pradesh	• 2 Common TSDF proposed at Mujaffarnagar and Bulandshahar	• 2 common incinerator at Kumbhi . One with Ramky site +one with Bharat oil.	Nil
26	Uttaranchal	Nil	Nil	Nil
27	West Bengal	Nil	Nil	Nil
	UTs :			
1	Chandigarh	Nil	Nil	Nil
2	Pondicherry	1	Nil	Nil
3	DDDNH	Nil	Nil	Nil

5.2 State-wise Details on TSDF :

The State wise details of TSDF is presented in the following para.

5.21 Andhra Pradesh:

1. TSDF at Dundigal :

The first TSDF in the state was developed by M/s. Ramky Enviro Engineers Ltd., 'Ramky House',Rajbhavan Road, Somajiguda, Hyderabad- 500 082.in the name and style of M/s. Hyderabad Waste Management Project, at Dundigal, Rangareddy District. M/s. Hyderabad Waste Management Project, Dundigal, Rangareddy District. is presently catering to **727** Members of Hazardous Waste Generators. The TSDF facility at Dundigal was developed on a site of area of about 200 acres where the industrial Hazardous Waste was dumped previously prior to the existence of TSDF. The first cell mainly comprised of all the waste which was illegally dumped.

The second cell of TSDF Dundigal came in to operation from September 2001 and about 5,15,000 Tons of Hazardous Waste has been landfilled as on March 2008. The life of this second cell of TSDF is designed as 30 years with a designed capacity of 4.5 Million Tons

The TSDF facility at Dundigal is also having a common incinerator of capacity of 1.5 Tons/ hour. The common incinerator was started in the month of November 2006. The TSDF facility was so far collected about 10,890.72 Tons of Incinerable waste from its member industries and is in the process of incinerating the same. The facility has so far incinerated about 5125.073 Tons. of waste.

2. TSDF at Parawada , Visac -

The same group has developed another TSDF by name M/s. Coastal Waste Management Project at Parawada, Visakhapatnam District for catering the waste from 5 coastal districts.

The second TSDF was developed at Parawada, Visakhapatnam District. with a designed capacity of 5 Million Tons with a designed life of 25 years. M/s. Coastal Waste Management Project at Parawada, Visakhapatnam District. is presently catering to **55** Member Hazardous Waste Generators. This TSDF facility has so far collected about 17,781 Tons of Hazardous Waste from its member industries and has disposed off about 15,054 Tons of Hazardous Waste into land filling.

The TSDF is proposing to install a common incinerator for incinerating the Incinerable Hazardous Waste. The TSDF was started in November 2006. Tipping has started in February 2007.

5.22 Assam :

Strategies proposed for management of Hazardous Waste in the State of Assam :

All the major sector industries in Assam have been directed to constitute a Hazardous Waste Management Committee to be headed by the top management as head of the Committee for formulation of action plan & Implementation of Hazardous Waste (Management & Handling) Rule 1989 as amended. They are to meet once in a month to review the situation.

Secondly, Board also make it mandatory to organize health checkup camp for the people residing within a radius of 5 km distance from major hazardous Waste generating units at an interval of every six months with regular submission of the report to the Board along with photographs.

In addition to this, Board has taken various steps for construction of CTSDF as per direction of the Supreme Court Monitoring Committee (SCMC) vide letter No. 23-8/2004-HSMD (Vol.-II), dtd. 21/8/2006. Accordingly, Board has requested the state Govt. for allotment of 60 (sixty) across of land for proposed construction of CTSDF in the Central Assam area preferably near M/s. ONGCL, Jorhat and M/s. ONGCL, Sivasagar area. The Hon'ble Minister of Revenue, and Chief Secretary, Govt. of Assam is also requested for their intervention regarding allotment of land for proposed construction of CTSDF. Once the land is available, the other formalities will be observed as fast as to pave the way for construction of CTSDF.

5.23 Chandigarh :

Presently approx 955 MT/yr of Hazardous Waste is being generated in Chandigarh out of which 723.00 MT/yr is recyclable/reprocessed and the remaining 232 MT/Yr. is to be disposed to the landfills/Incinerated. The same is presently stored at the unit's premises. Since the waste generated is very less in amount it was not economically viable to develop a TSDF facility in Chandigarh. Now CPCC has tied up with Punjab Pollution Control Board and the hazardous waste generated in U.T., Chandigarh will be disposed of to Treatment Storage & Disposal Facility (TSDF) at Derabassi (Punjab). The units have been asked to sign an agreement with M/s Ramky Enviro Engineers Ltd., (Operator of the facility) and M/s Nimbuan Greenfield Punjab Ltd., (NGPL-Developer of the facility).

Further as observed above although the total amount of hazardous generated has decreased in quantity from 990 MT/ year to 955 MT/yr and the amount of actual waste that needs to be disposed of into the TSDF has increased from 195 MT/Yr. to 229.5 MT/Yr.

5.24 Chhattisgarh :

The quantity of Hazardous Wastes generated in the state is less than the quantity specified for establishment of common disposal site. However it is proposed to develop Common Hazardous Wastes Treatment, Storage, Disposal facilities, site selected at Bhilai-Durg and Rajnandgaon area. For this purpose, site have been identified further action for notifying it is under way.

- At present all 174 hazardous wastes generating units have authorization as per Hazardous Wastes (Management & Handling) Rules, 1989 (as amended on 2003). These hazardous wastes generating units are complying the authorization conditions.
- Hazardous wastes generating units have already displayed the relevant information's with regard to Hazardous wastes both in English and local language.
- The quantity of Hazardous Wastes generated in the state is less than the quantity specified for establishment of common disposal site. However, a facility of treatment, storage and disposal of hazardous wastes for M/s Balco, Korba is and M/s Bhilai Steel Plant, Bhilai is under different stages of execution. The remaining wastes is less in quantity and are recyclable and is suitably taken care of by the respective industries. If any industry need TSDF, the TSDF being provided by the above two industries will accommodate hazardous wastes from other industries on mutual agreement basis, as and when required. We have also approached the TSDF at neighboring states to accommodate our hazardous wastes, M/s RAMKY Enviro Engineers Ltd., Indore (M.P.) and M/s SMS Infrastructure Ltd., Nagpur (M.S.) have agreed to accommodate hazardous wastes in their TSDF till such time our TSDF is operative.
- At present common treatment storage, disposal landfill sites have not been established in the state. The units, who will develop landfill site for their captive use, shall follow the criteria for hazardous wastes landfill sites and the manual for design, construction and quality control of liners etc. published by Central Pollution Control Board.
- The inventory of Hazardous Waste generation in the format prescribed by Central Pollution Control Board has already been sent vide letter 283/HO /HW/CECB/2005 Raipur, Dated 17/ 01/2005. and letter No. 5516/HO/HW/CECB/2005 Raipur /Dated 28/11/2005. As per CPCB letter. B-29016(SC)/01/05/PCI-I 3108 Division dated 02 January 2006 and B-29016(SC)/01/05/PCI-I 3108 Division dated 01 March 2006, the board has completed revised inventory and the same has been sent to CPCB vide letter no. 2396 dated 11/05/2006. A copy of the same has again been sent vide letter no.2707/HO/HSMD/CECB/2006 Raipur Dated 31/05/2006.
- There is no illegal dumpsite in the state. The quantity of Hazardous Wastes generated in the state is less than the quantity specified for establishment of common disposal site. However it is proposed to develop Common Hazardous Wastes Treatment, Storage, Disposal facilities at the site Bhilai-Durg area.

- There is no closure direction issued because at Present all 158 hazardous wastes generating units have authorization as per Hazardous Wastes (Management & Handling) Rules, 1989 (as amended on 2003).

5.25 Goa :

At present, there is no common Hazardous Waste Storage Treatment & Disposal facility in the state of Goa. Generators of landfillable waste are presently storing the waste in their own premises. Photographs of some of these storages are reproduced here. This waste will be transferred to the secure landfill facility expected to be created shortly.

One company, Syngenta India Ltd. has in-house facility for incineration of hazardous waste. This facility is utilized only for the waste generated in their own plants. CIPLA Ltd. have a captive HW incinerator for management of waste generated in their units. The other incinerable waste is sent to the Common Hazardous Waste Treatment & Disposal facility at Taloja in Maharashtra. Recyclable waste is partially recycled in the state and a major portion is sent out of state for recycling.

Two industrial units which are also major waste generators (M/s Sunrise Zinc & M/s Nicomet) are in the process creating a secure landfill facility for their own use. The REIA studies were carried out by NEERI & the technology is being provided by M/s Ramky Consultants. The facility will be operational in near future. A Common Hazardous Waste Storage, Treatment & Disposal facility is being created by the industries' association at Dharbandora, South Goa. The site has been notified and the proposal is awaiting environmental clearance from the Ministry of Environment & Forests, Government of India.

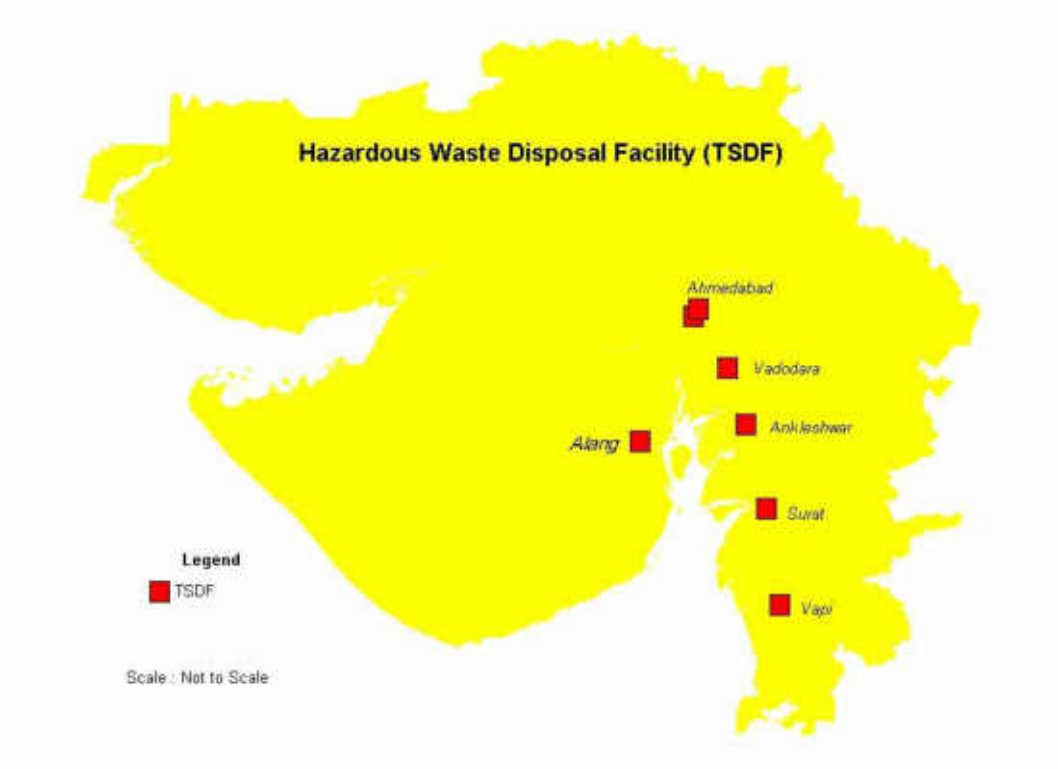
5.26 Gujarat :

There are seven Common Hazardous Waste Treatment, Storage and Disposal Facilities in operation in Gujarat.

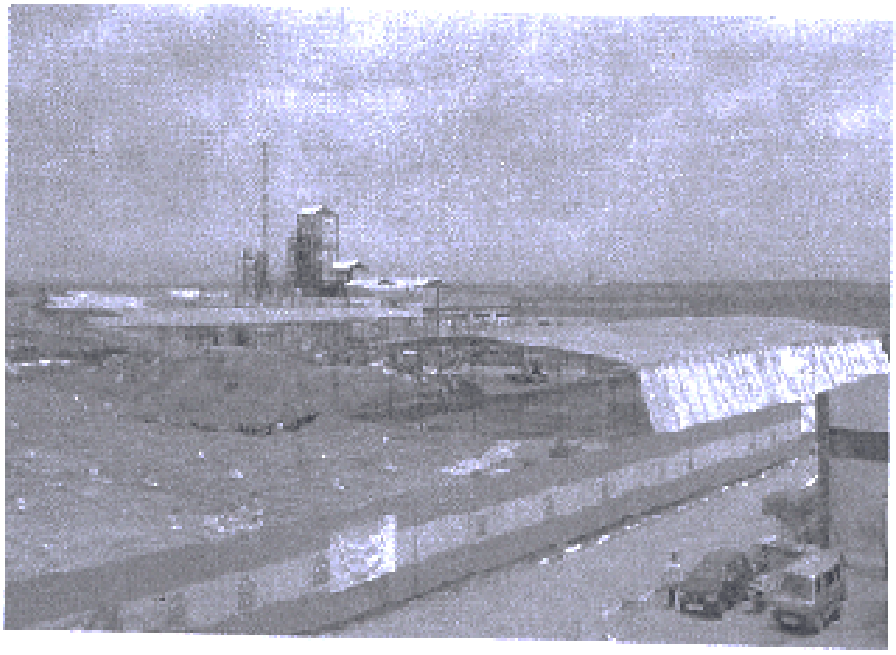
TABLE

Sr No	Facility
1	Naroda Enviro Projects Ltd., Odhav, Ahmedabad
2	Green Environment Co-ope Society Ltd., Vatva, Ahmedabad
3	Nandesari Enviro Control Ltd., Nandesari, Baroda
4	Bharuch Enviro Infrastructure ltd., Ankleshwar, Bharuch
5	Gujarat Enviro Protection & Infrastructure Ltd., Sachin, Surat
6	Vapi Waste & Effluent Management Co Ltd., Vapi, Valsad
7	Gujarat Maritime Board, Alang, Bhavnagar

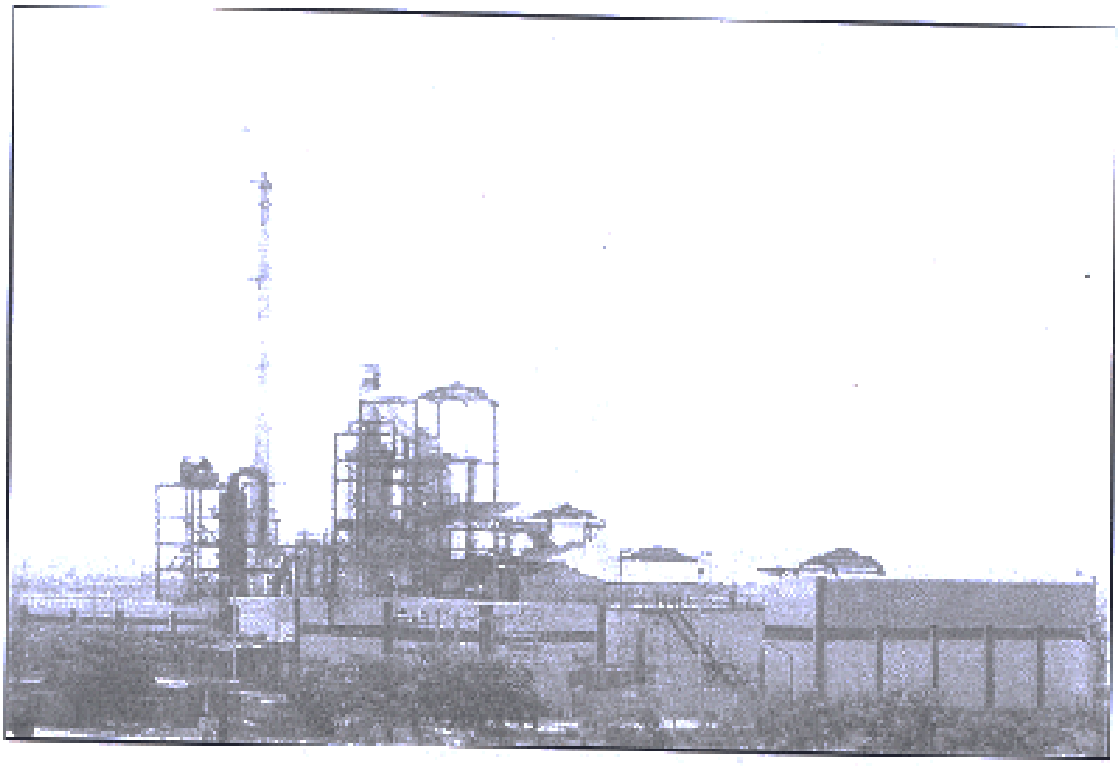
Map showing Common Hazardous Waste Disposal Facilities in Gujarat State



Vegetative Cover over closed TSDF Cell - Ankleshwar



TSDF Site during Monsoon



Common Hazardous Waste Incinerator at Ankleshwar

In addition to above, there are 14 private TSDF facilities available in operation. Also, there are 4 common incinerators and 34 captive incinerators in operation in Gujarat.

Table
Common Hazardous Waste Incinerators - Gujarat

Sl. No.	Name
1	Nandesari Enviro Control Ltd, Vadodara
2	Bharuch Enviro Infrastructure ltd. Ankleshwar, Bharuch
3	Gujarat Enviro Infrastructure Ltd, Surat
4	Vapi Waste & Effluent Management Co. Ltd. Vapi, Valsad

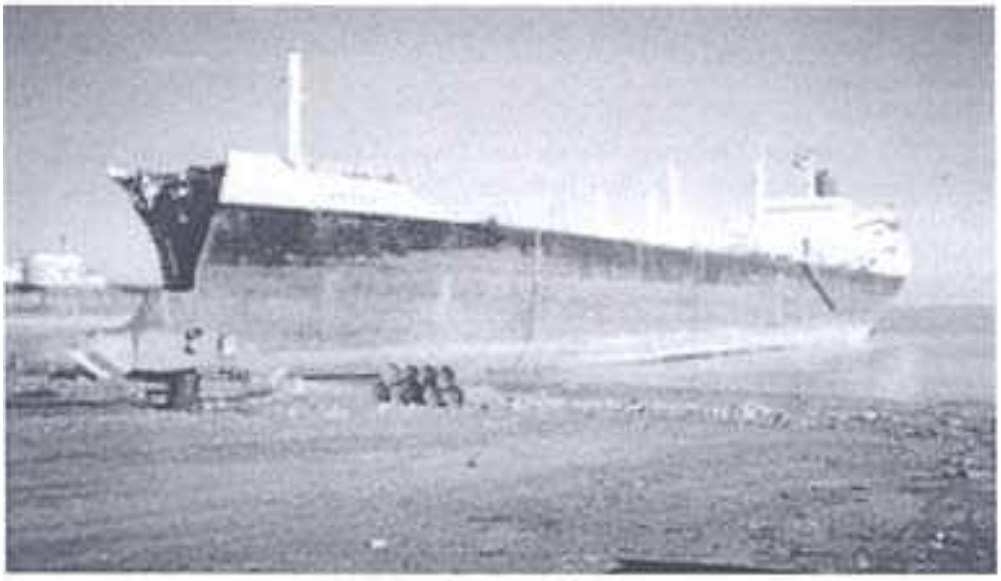
Table
Captive HW Disposal Facilities – Gujarat

Sr.No	Name of Unit	Address	LF	Incin
1	Gujarat Alkalies & Chemicals Ltd.,	P.O.Dahej Dist:-Bharuch	Yes	No
2	Indian Petro Chemicals Corporation Ltd.,	P.O. Petrochemicals –391346, Dist:-Vadodara	Yes	Yes
3	Metro Chemicals Ltd., P.O. Umraya,	P.O. Umraya, Tal.Padra, Dist.Vadodara-391440	Yes	No
4	Colour Sinth Group of Industries,	S.NO.12,Block No.244,Vill.Jiav,Ta.Choryasi ,Dist.Surat	Yes	No
5	Atul Proucts Ltd.,	Agro ChemicalsDiv. Atul-396020	Yes	No
6	Panchmahal Steel Ltd,	GIDC Estate, Kalol-389330, Dist.Panchmahal	Yes	No
7	Gujarat Alkalies & Chemicals Ltd.,	P.O. Petrochemicals, Dist:-Vadodara	Yes	No
8	Shree Ram Alkalies & Chemicals,	749,GIDC, Jhagadia, Dist.Bharuch-393110	Yes	No
9	Gujarat Refinery,	I O C L,Reliance Div.,P.O.Javaharnagar, Dist.Vadodara-391320	Yes	No
10	Indian Petrochemicals,	Gandhar Petrochemical Compelex, P.O.Dahej-392120,Ta.Vagra, Dist.Bharuch	Yes	No
11	Reliance Petrolium Ltd,	Vill.MotiKhavdi,P.O.Digvijaygram-361140, Dist.Jamnagar	Yes	No
12	Indo Gulf Corporation Ltd.	HINDALCO Ind. Ltd.,Unit Birla Copper,P.O.Dahej, Dist.Bharuch-392130	Yes	No
13	Agrimore Ltd., Atul	P.O. Atul-396020. Dist. Valsad	Yes	No
14	Maradia Chemical Ltd.,	Maradiyanagar, AT.Sitagadh, Ta. Sayla, Dist. Surendranagar	Yes	No

TABLE
Captive Hazardous Waste Incinerators

Sl No	Name	Location	District
01	IPCL	Vadodara	Vadodara
02	Transpek Ind. Ltd (Ekalbara)	Ekalbara, Tal. Padra	Vadodara
03	Tarak Chemicals Ltd	Karkhadi, Tal. Padra	Vadodara
04	Admarc Polycoat Company	Padra	Vadodara
05	GSFC – Polymer Unit	Vadodara	Vadodara
06	EI Du Pont	Savli	Vadodara
07	Newage Industrial Oil (P) Ltd	Savli	Vadodara
08	Heavy Water Project	Vadodara	Vadodara
09	LaxXess ABS Ltd	Poicha, Tal. Savli	Vadodara
10	Gujarat Insecticides Ltd., Unit II	Ankleshwar	Bharuch
11	United Phosphorus Ltd., Unit II	Ankleshwar	Bharuch
12	Lupin Agrochem India Ltd	Ankleshwar	Bharuch
13	Rallis India Ltd	Ankleshwar	Bharuch
14	Pesticides India Ltd	Ankleshwar	Bharuch
15	Godrej Industries	Ankleshwar	Bharuch
16	IPCL	Dahej	Bharuch
17	Ficom Organics	Ankleshwar	Bharuch
18	Wockhardt Ltd (Bulk Drug Division)	Ankleshwar	Bharuch
19	Cadila Health Care	Ankleshwar	Bharuch
20	Zydus Cadila	Ankleshwar	Bharuch
21	Hikal Ltd	Ankleshwar	Bharuch
22	Isagro Asia Agrochemical Ltd	Ankleshwar	Bharuch
23	Narmada Chematur Petrochemical Ltd	Bharuch	Bharuch
24	Bilag Industries	Vapi	Vapi
25	Atul Industries Ltd	Atul	Valsad
26	Sabero Organic Gujarat Ltd	Sarigam	Valsad
27	United Phosphorus Ltd	Vapi	Valsad
28	Cyanide & Chemicals Ltd	Olpad	Surat
29	Colourtex Industries Ltd	Pandesara	Surat
30	Excel Industries Ltd	Bhavnagar	Bhavnagar
31	Dishman Pharmaceutical & Chemicals Ltd	Lodariyal	Ahmedabad
32	Shreeji Petrochem	Vithol, Tal – Halol	Panchmahal
33	Lanxess ABS Ltd	Katol	Panchmahal
34	Casil Health Care Ltd	Nani Kadi, Tal – Kadi	Mehsana
35	Reliance Industries Ltd	Moti Khavdi	Jamnagar
36	KSEZ Plastic Unit Association	KSEZ Gandhidham	Kutch
37	Sun Plastic	Gandhidham	Kutch
38	Chemical and Dyestuff	Nadiad	Kheda

TSDF – Alang (Gujarat)



Ship Breaking Activities – Alang (Gujarat)

5.27 Jharkhand :

In Jharkhand till date Common Storage Treatment & Disposal Facility has not been developed. All the units have their own disposal arrangements for toxic hazardous wastes generated. However they have not established incinerators to incinerate hazardous wastes such as paint residues etc.
Only one industry M/s. Tata Motors Pvt. Ltd at Jamshedpur has its own incinerator. After the passage of hazardous waste Management and Handling Rules, 1989 some units have developed their own secure landfill facility inside their factories.
The inventory reveals that 5 units are engaged in recycling/reprocessing of hazardous waste.

5.28 Kerala:

The Government of Kerala identified 50 acre of land, meeting the specifications of the CPCB, in the premises of the FACT, Ambalamedu, Ernakulam for CTSDF. It is located in the district of Ernakulam, which is the largest source of hazardous waste in terms of both, number of units generating hazardous wastes and quantum of waste. Logistically, the district has the advantage of being centrally located within the State and this will allow for deriving benefits of accessibility and transport economics. The location of the CTSDF is shown below.

The Common Treatment Storage and Disposal Facility will accept only such wastes as has been authorised by the State Pollution Control Boards and that meets the prescribed specifications.

Facilities at the TSDF - Ernakulam

The CTSDF will comprise the following facilities:

- Secured land fill
- Waste Treatment & Stabilization facility
- Storage Shed
- Adminstrative Office, laboratory and Stores
- Container maintenance shed
- Security office
- Laboratory equipments for comprehensive analysis
- Leachate collection and treatment facility
- Washing facility
- Weigh bridge
- Material handling and transportation equipments
- Utility requirement (Power & water)
- Internal roads, compound wall/ fencing
- Incinerator for industrial waste - (Proposed in second phase if necessary)

Present status:

Government appointed the Kerala State Industrial Development Corporation as Nodal Agency to form a Public Limited Company for establishing the CTSDF. The KSIDC promoted a Public Limited Company viz. Kerala Enviro Infrastructure Limited (KEIL) for the purpose. All the necessary requirements like land identification, EIA study (through FEDO), public hearing and notification of the site have been completed. KEIL floated enquiries and tenders through CRISIL. The developer of the facility was selected through a four stage bidding process. M/s. United Phosphorus Ltd. having experience in hazardous waste management and operating a TSDF facility at Baruch district, Gujarat is the developer selected. They have become the major share holder in KEIL and have nominated two persons to the director board of KEIL. Development of the 50 acre land procured for the CTSDF has been started.

The total project cost estimated is Rs 32 crore. The TSDF is designed for a capacity of 50,000 TPA for 20 years. The project cost is for land development, secured land fill, office, laboratory, treatment facility etc. Out of this, Rs. 2 crore is Central subsidy and Rs. 2 crore is State subsidy. The Government of Kerala has already contributed Rs. 2 crore through KSIDC and sought sanction and release of Rs. 2 crore by the Government of India. As directed by the MoEF, draft Memorandum of Understanding to be signed by the Central Government, State Government and Project Proponent was prepared based on the format received from MoEF. The State Government accorded sanction to the Board to sign the MoU on behalf of the State Government. The MoU was signed by MoEF, KSPCB and KEIL on 15.2.2007. The

MoEF has released Rs. 80 lakh as the first installment to the Board for onward release to KEIL on the latter furnishing requisite bank guarantee. The construction activities have been started at the site and are progressing in full swing. Now temporary storage building, laboratory building and fencing are being provided with priority. The work is also commenced for the first cell of the land fill facility. For collection and transportation of wastes, orders for sample container has been placed and is expected to be delivered soon.

5.29 Karnataka

Treatment Storage and Disposal Facility (TSDF) at Dabaspet (Karnataka)

The Karnataka State Pollution Control Board has proposed to set up a common TSDF at Dabaspet. The salient features of the TSDF are given below:

- The TSDF site is located about 40kms from Bangalore on Bangalore-Pune Highway (NH-4).

- The total land area identified is about 93.18 acres.
- The site was notified by the Government of Karnataka on 21.2.2003.
- Preliminary investigations and REIA were completed in January 2004 by GTZ, Germany, under HAWA Project.
- An intensive public awareness campaign was conducted in the surroundings (5 km radius) of Dobbasapete site for a period of seven months (June 2003 until January 2004) where all the stakeholders were appraised about the project. Public hearing was held on 20.2.2004.
- The State Government accorded approval as required under Rule 8 of Hazardous Waste (Management & Handling) Rules in 21.4.2004 vide a Government Order No. FEE 293 ECO 2002, Bangalore dated 21st April 2004.
- The conceptual design drawings and collection systems relating to TSDF including the final DPR was prepared in June 2004 by GTZ.
- State Cabinet clearance has been obtained for the project in the month of June 2005
- The cost of land acquisition for TSDF has been estimated to be Rs. 8 crores. The KIADB has released so for Rs 5.4 crores to the land owners.
- The detailed design drawings to the TSDF has been prepared by the private operator and submitted to CA. KIADB in turn submitted the drawings to GTZ HAWA project office for further opinion/approval.
- Contracting agreement between government of Karnatka and Private operator along with KIADB has been signed on 01/12/2006.

TSDF Operator Model

BOOT model was decided for the Karnataka, as there are already several examples of such facilities working with Private Sector Participation (Private Operator) in the States of Gujarat, Maharashtra & Andhra Pradesh. During the initial years, the facility will be monitored and managed by a Contracting Authority (CA) viz. Karnataka Industrial Areas Development Board (KIADB) and later a Special Purpose Vehicle (SPV) will take over. The SPV will have as members Industrial Association and Government representatives. The TSDF will be in operation for 20 years and will have a post closure monitoring period of 30 years.

Tendering Procedure:

An Expert Committee comprising of technical experts have scrutinised the bidding documents and laid down procedures for evaluating the tenders as per the norms laid down in "The Karnataka Transparency in Public Procurements Act, 1999. Tendering for the selection of private operator was undertaken in two stages, Pre-qualification and Final tendering. Pre-qualification was carried out between December 2004 to February 2004 and four companies were short-listed. The final tendering activity was undertaken between June 2006 to July 2006. M/s. Ramky Consortium has been awarded the contract to be the Private Operator for TSDF Dobbasapete. The Steering Committee constituted for the project with

the Principle Secretary, Department of Ecology, Environment and Forests as its Chairman has approved the same. M/s. Ramky Consortium have agreed to execute the project

Land Acquisition

The Land for the facility will be given by the Department of Forest Ecology & Environment to the Private Operator on lease for a period of 51 years. The land will be acquired by the KIADB which is also designated as the Contracting Authority. The State Government have given approval for land acquisition for setting up the project on 8-6-2006 to an extent of 93.18 acres. Notices were issued by KIADB to the land owners. The Price Advisory Committee headed by the Deputy Commissioner has recommended a compensation of Rs 8 lakhs/acre (Rupees eight lakhs per acre). The subject of land acquisition has been discussed in the Steering Committee and it is decided to go ahead with the acquisition by paying the compensation as recommended by Deputy Commissioner of the area.

Site No.2: Siddalagatta site –Kolar (Karnataka)

- Located at 70 KMs from Bangalore in Kolar District
- Notified on 21.02.2003
- MOEF clearance obtained for forest land
- To prepare the REIA report, EPTRI Hyderabad has been engaged as consultants.
- The EPTRI has made presentation on the draft REIA prepared on 29/04/2006 before the Technical Advisory committee of the Board.
- The TAC has made minor suggestions to incorporate in the final REIA report.
- After receipt of the REIA report public hearing for the site is to be conducted.
- Rupees 27.10 lakhs released to Deputy Conservator of Forest, Kolar division, Kolar on 22 March 2007, towards compensatory afforestation.

5.30 Madhya Pradesh

Common Treatment, Storage and Disposal Facility has been constructed and has become operational from November 2006, at Plot No. 104, Industrial Area No. II, Pithampur Distt. Dhar (M.P), by M/s. M.P. Waste Management Facility (A group of M/s. Ramky Enviro Engineers Ltd. Hyderabad) on BOOT basis.

The TSDF has following facilities:
1. Temporary storage of wastes.
2. Solidification/stabilization.
3. Incineration.
4. Secured Land Fill.
5. ETP for leachates.
6. Lab for analytical purposes.

The TSDF is designed to dispose following wastes for 20 years:-

- Direct Land Fill. - 50,000 MT./Y
- Solidification/stabilization followed by land fill - 20,000 MT/Y
- Incineration - 20,000 MT/Y

Present membership of the facility is: 235 Units.
Till March 2008 about 24,600 MT of hazardous waste has been disposed off in the facility.

5.31 Meghalaya

Though the industries generate a considerable amount of hazardous waste at an estimated rate of 7159.374 MTA but 86% of the waste generated is recyclable and only a minimal quantity of 19.28 MTA is recyclable. As such, development and operation of common treatment, storage and disposal facilities is not economically feasible. It is also environmentally unsound to set up individual treatment and disposal facilities by the industries.

However, in view of the Hon'ble Supreme Court directions dt.14.10.2003 in the matter of Writ Petition (Civil) No.657 of 1995, the Meghalaya State Pollution Control Board has taken up the matter of establishment of common Hazardous Waste Treatment, Storage and Disposal Facility (TSDF) with the Industries Deptt., Govt. of Meghalaya in accordance to the provisions of Rule 8 of the Hazardous Waste (Management & Handling) Amendment Rules, 2003 for:-

(i) identifying of site for establishing the common facility for treatment, storage and disposal of hazardous waste jointly with the occupier or operator of a facility or any association of occupiers;

(ii) assessment of the suitability of the selected site on the basis of the Project Report, EIA Report submitted by the operator of the facility, occupier or association of occupiers and the details of Public Hearing conducted by the SPCB including accord of approval there of;

(iii) acquisition of the approved site either by itself or by the operator of a facility or occupier or any association of occupiers;

(iv) notification of the acquired site for setting up of the common treatment, storage and disposal facility (TSDF) of Hazardous Waste generated in the State.

Since in Meghalaya the majority of hazardous waste generating units are located in Ri-Bhoi District and as such development of a common Hazardous Waste Treatment, Storage and Disposal Facility (TSDF) is preferred to be located within the District and close to the Export

Promotion Industrial Park (EPIP) where such hazardous waste generating units are concentrated. The Directorate of Industries, Govt. of Meghalaya is in the process of identification of suitable common landfill site in the vicinity of the EPIP, Byrnihat, Ri-Bhoi District.

The MSPCB is also exploring the possibility of sharing the common facilities to be established in the neighboring state of Assam in co-ordination with the Assam State Pollution Control Board.

5.32 Nagaland :

As per the decision taken during the Chairman and Member Secretaries meeting at Mumbai, at Common TSDF for the North East States is to be set up in Assam for which the Assam Pollution Control Board is taking the initiative

5.33 Pondicherry –

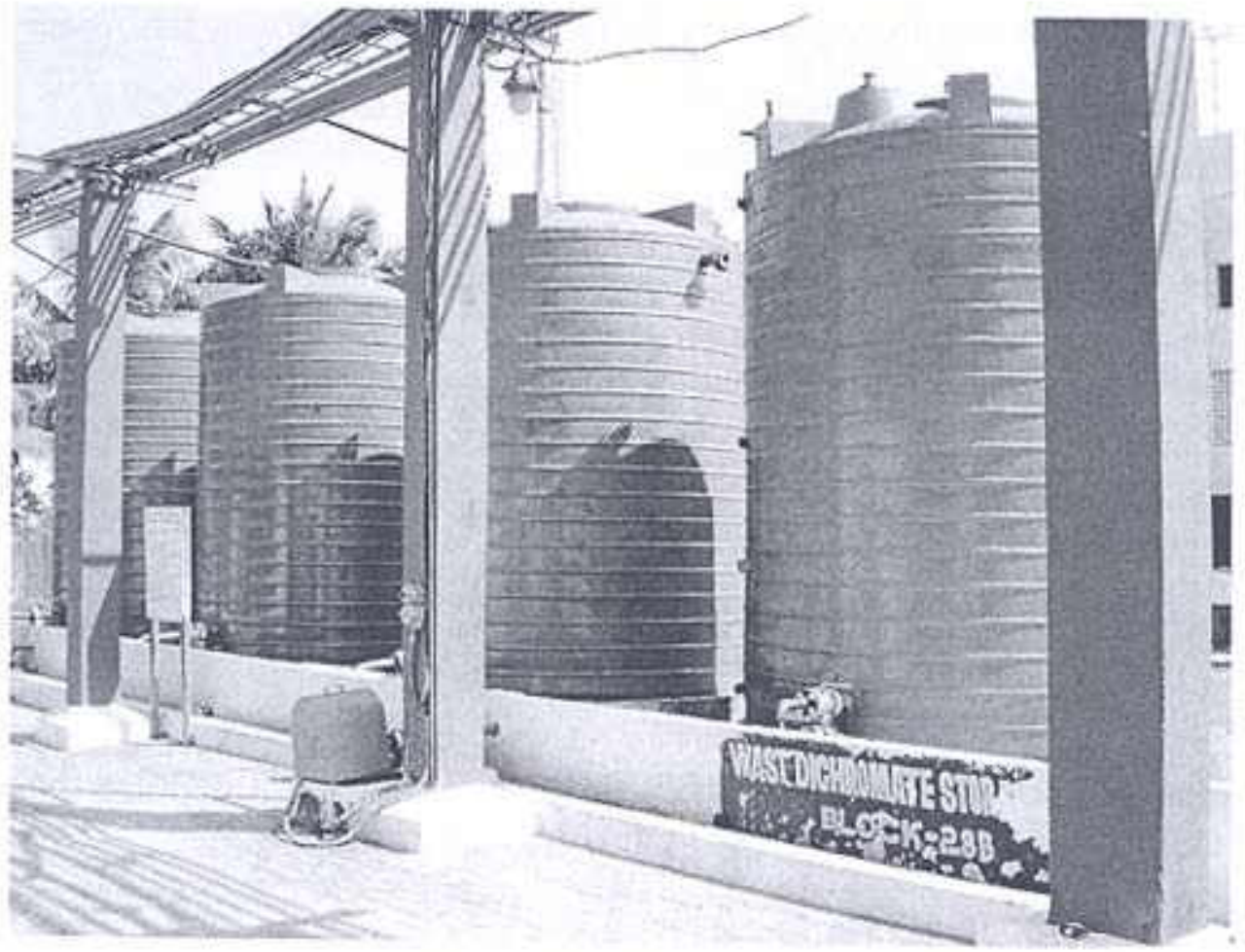
Earlier a team comprising of officials from Agriculture Department, Town & Country Planning Dept., Revenue Dept. and Department of Science, Technology & Environment of this Administration visited about 10 sites (Government Poramboke lands) and selected a site at Sedarapet for developing a common site and providing facilities for disposal of Hazardous Wastes. However the Central Pollution Control Board (CPCB) has conveyed that the site is not suitable in view of its location closer to road.

Meantime the High powered Committee constituted by the Hon'ble Supreme Court recommended that the TSDF will not be feasible for the States generating landfillable wastes of less than 20,000TPA. As the landfillable wastes generation in U.T. is less than 150 TPA the TSDF has not been identified and proposed to share the facility at Tamil Nadu as suggested by the Southern Zonal council.

But in the 52nd Conference of Chairmen and Member Secretaries of CPCB and SPCBs / Committees held on 5th and 6th of January 2006, at Mumbai, it was decided that the States / UTs shall provide an individual Treatment, storage and disposal facility (TSDF) for disposal of Hazardous waste generated in their States / UTs, before June 2006. Therefore action has been initiated to establish treatment, storage and disposal facility at Special Economic Zone (SEZ) at Sedarapet. A letter has been sent to the Managing Director, PIPDIC to provide 5 acres land to cater the needs of Hazardous waste storage for atleast 20-25 years. But they have refused to provide the land at SEZ.

As per the decision taken in the 53rd Conference of Chairmen and Member Secretaries of CPCB and SPCBs / PCCs, a letter has been sent to Tamil Nadu Pollution Control Board (TNPCB), Chennai, to permit PPCC to share the TSDF of Tamil Nadu for disposal of land fillable Hazardous waste generated in U.T. of Puducherry until a suitable site is identified by Government of Puducherry. Reply from TNPCB is awaited.

PPCC is also in the process of identifying land in the Puducherry Region and at the same time requesting TNPCB for sharing of the facility available with them as [per the decision taken in the 54th conference of Chairmen and Member Secretaries of CPCB and SPCBs /PCCs held on 22/23 May 2008 held at New Delhi.



Storage of Waste Dichromate by M/s Shasun Chemicals & Drugs, Kalapet (Pudducherry)

5.34 Uttar Pradesh :

INCINERATION :

The incineration is of two types. One may be individual incineration through incinerator with proper APCS within the plant premises and other may be the incineration through common incinerators with proper Air Pollution Control System authorized by Board.

At present there are 13 incinerators installed by individuals industries within their industrial premises. One common incinerator installed in the premises of M/s Bharat Oil Co., Ghaziabad, is for own purpose as well as for common use of other industries, for limited type of hazardous waste. Common Incinerator is also proposed in phase – II by M/s U.P.Waste Management Project Ltd.

Details of captive incinerators installead by individual industries in Uttar Pradesh

S.N..	Name & Address of the industry	Capaacity of incinerator (Kg./hr)	Installed capacity of the incinerator based on 16 hrs./day and 300 working days (TPA)	Capacity being utilized (TPA)	Spare capacity (TPA)
1	M/S L.M.L., Panki, Kanpur	50	240	Lying closed	Nil
2	M/S Goodlus Nerolac, Kanpur	20	96	96	Nil
3	M/S Daurala Organics, Meerut	150	720	720	Nil
4	M/S Megma Industries, Muzaffarnagar	50	240	120	120
5	M/S Ravi Organics, Muzaffarnagar	12.5	60	30	30
6	M/S India Polyfibers, Barabanki	80	384	270	114
7	M/S Jubiliant Organosys, Gajraula, Moradabad		720 (2.4TPD)	450	270
8	M/S Bharat Oil Co., Ghaziabad	250	1200	200	1000
9	M/S Yamha Motors, G. Noida	100	480	180	300
10	M/S Asian Paints, G. Noida	75	360	128	232
11	M/S Honda Ciel Cars Pvt. Ltd. G. Noida	175	840	300	540
12	M/S New Holland Tractor, G. Noida	50	240	192	48
13	M/S India Pesticides Ltd., Chinhat, Lucknow	150	720	540 (75%)	180
14	M/s T.I. Cycles India, Phase II, Noida., Gautam Buddha Nagar	50	240	192 (80%)	48
	Total	**1212.5**	**6540**	**3418**	**2882**

Secured Land Fill

The waste, which is not recyclable and incinerable, is subjected to disposal in secured land fill site after stabilization. It is also advisable not to construct secured land fill sites everywhere since enormous precautions and care is needed not only during operation of TSDF but also after it is filled-up. Waste will remain for 100 years or so in the secured land fills which needs regular surveillance and monitoring even after its capping. Therefore common T.S.D.Fs have been proposed / in operation at following places in the state of U.P.:-

1. Rooma, Kanpur
2. Kumbhi, Kanpur Dehat
   (a) in 7 hectares of land
   (b) in 3 hectares of land
3. Banthar, Unnao
4. Bulandshahar
5. MuzaffarNagar

Status of T.S.D.F is as follows:-

1. Operational (at three sites)
   - ❖ Rooma,Kanpur,
   - ❖ Kumbhi,Kanpur Dehat- in 7 hectares of land
   - ❖ Banthar ,Unnao – one cell of SLF in operation
2. Under construction (at one site)
   - ❖ Banthar, Unnao- three cells of SLF

3 T.S.D.F for which process of Land Acquisition under process (one site)
   - ❖ Bulandshahar

4 Site Identified (one site)
   - ❖ Muzaffarnagar. (Construction proposed in 3rd phase after Bulandshahar)

More about TSDF

1. Rooma, Kanpur

a. T.S.D.F for hazardous waste from tanneries has been constructed by Nagar Nigam, Kanpur at Rooma, having capacity of 20,000 m^3 (115mx115mx3.5m).
b. Tender cost of the project was Rs 2.96 Crore (estimated cost by EIL was Rs.2.86 Crore).
c. This T.S.D.F has been completed and is in operation from July, 2006. Stabilized Hazardous Waste of tanneries at Jajmau, Nagar Nigam is disposing off Kanpur at this T.S.D.F.

d. T.S.D.F is being developed at approximate 36 acre area by Kanpur Nagar Nigam and is situated near Kanpur-Allahabad highway. Present all of T.S.D.F is size 115x115x3.35 m3 with capacity of 22000 m^3 hazardous waste. T.S.D.F. is made of single liner system and it consists of 650 mm compacted soil, 900 mm compacted clay liner,1.5 mm HDPE sheet,300 mm clay.100/150 mm diameter pipe has been provided for leachate collection which is covered with 150 mm sand layer sump well outside the S.L.F. has been provided.

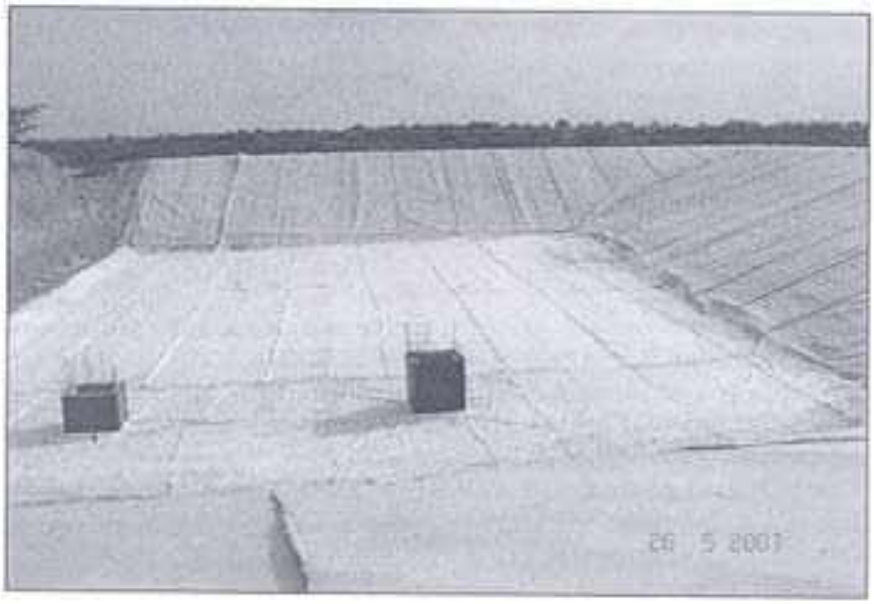
Method of Operation :

This T.S.D.F is mainly meant for disposal of sludge from tannery units of Kanpur and the sludge from C.E.T.P. situated at Jajmau, Kanpur. Hazardous waste generated by tanneries of Jajmau, Kanpur is is brought to the site by Nagar Nigam, Kanpur every Sunday and is mixed with lime and ash in the ratio of (1:2:12 viz. lime: ash: hazardous waste) prior to disposal in SLF.
The SLF is at present full. U.P.P.C.B. has directed Nagar Nigam, Kanpur to do the needful to increase the storage capacity of this SLF or to construct a new secured landfill since adequate space is available for the same.

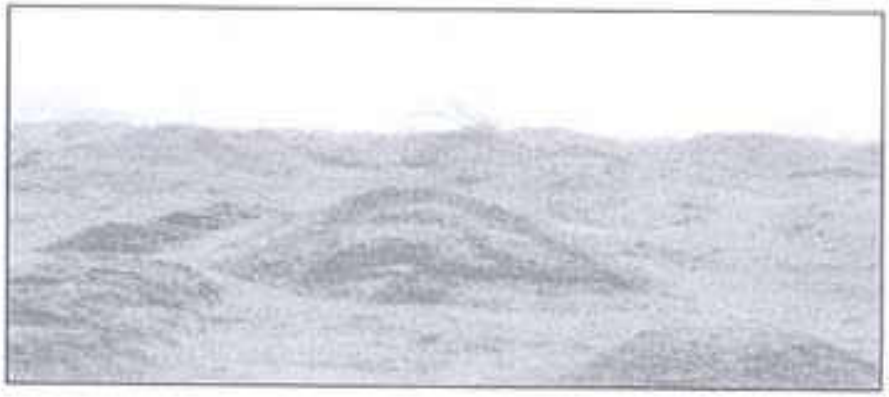
2. Kumbhi, Kanpur Dehat

(a) Out of 10.0 Hectares, 3 Hectares was leased to an operator (Kanpur Pollution Control Committee) for setting up a T.S.D.F. for Hazardous wastes but the same has been withdrawn.

(b) M/s U.P. Waste Management Project a unit of M/s Ramky Enviro Engg. Pvt. Ltd. has been identified as operator for the T.S.D.F planned on 7.0 hectares land provided by U.P.P.C.B. A lease agreement for land has been executed and the operator has deposited the annual lease rent in the Board. Pollution Control Board has issued site clearance to M/S Ramky Enviro Engg. Pvt. Ltd. The work for construction of one cell (capacity approximately one lakh MT) of secured land fill along with other facilities such as weigh bridge, temporary storage, stabilizer unit, intractable waste store, general stores, tyre wash has been completed. Work regarding administrative buildings is in progress. Three more cells are proposed at this site. Preliminary activities such as registration of members, testing of waste samples of member units has been started by M/S Ramky Enviro Engg. Pvt. Ltd. and about 75 members were registered till July 2007.The T.S.D.F has been commissioned and some of the important features of this T.S.D.F are given in the format for SCMC report attached in the coming pages. Cross section of the SLF already constructed is shown in fig- and some of the photographs are also shown in coming pages.



SLF under construction at TSDF Kumbhi, Kanpur Dehat



Illegally Dumped hazardous Waste from basic chrome sulphate units at Khanpur village, kanpur Dehat.

3. Banthar , Unnao

a. NOC granted by State Pollution Control Board in 2002 and Ministry of Environment & Forests, Govt. of India on 25.2.2004.

b. Site identified and acquired at Village Banthar within the Leather Technology Park being developed by the U.P. State Industrial Development Corporation. Project is being implemented by Banthar Industrial Pollution Control Company.

c. The T.S.D.F. will cater to Hazardous wastes generated from Tanneries situated in the Leather Technology Park at Unnao as well as for other industries situated in District Unnao.

d. It will be an integrated complex on 31 acres with a Common Effluent Treatment Plant, Central Chrome Recovery Unit and a T.S.D.F.

e. The total area proposed is 18 acres for the T.S.D.F. Acquisition proceedings under section 4/17 have been completed. Land acquisition by U.P.S.I.D.C. under section 6/17, which was pending due to various reasons has now been completed and U.P.S.I.D.C. has handed over 12 acres of land to M/s Banthar Industrial Pollution Control Company out of 18 acres land. Out of this 12 acre only 8 acre has been reported to be usable. DPR has been prepared. Construction is in progress for 3 SLFs.

f. Another T.S.D.F in 2.5 acres in the premises of the C.E.T.P. of Leather Technology park has been developed which would suffice for 3 years and would cater the hazardous waste from the industries within Unnao district. The work has been completed with proper lining with 1.5 mm HDPE geo-membrane. The testing and commissioning of the same has also been completed. This facility is operational from November, 2006.

4. <u>Bulandshahar</u>

Site has been identified at village Rasoolpur/ Rithouri tehsil Sikandrabad for which EIA was submitted by ITRC, Lucknow in the Year, 1999. The process of handing over/ possession of land to Board by District Administration is under progress. The permission for transfer of land is pending with Revenue Department of U.P. District Magistrate, Bulandshahar has sought clarification from Revenue Department, Lucknow, whether land has to be transferred to U.P.Pollution Control Board, free of charge or it is to be charged as per current market rate.

5. <u>MuzaffarNagar</u>

Hazardous solid waste disposal site has been also identified at Begarajpur Industrial Area, MuzaffarNagar. M/S Ramky Engg. Pvt. Ltd. has been selected for this site also and letter of intent has been issued to the Operator. They have informed vide letter dated 27.1.2006 that they had planned it for 3 rd phase after completion of T.S.D.F's at Kanpur Dehat and Bulandshahar.

5.35 Rajasthan

To ensure the compliance of Hazardous Waste (Management & Handling) Rules 1989 and subsequent amendments, it was felt necessary to develop Common Treatment, Storage and Disposal Facility (CTSDF) for the scientific disposal of hazardous waste, generated by the various industries in the State.

Subsequent to pursuance of the State Board, Udaipur Chamber of Commerce and Industries (UCCI), Udaipur identified a site near Village Gudli, Teh Mavli Distt. Udaipur. The area of the site was 8 Hectares. The State Board took initiative for development of CTSDF and carried EIA study of the referred site through M/s. National Productivity Council (NPC) in the year 1996.

The State Board forwarded EIA report with recommendations to the State Govt. The State Govt, satisfied with recommendations of the State Board, set apart the site vides Gazette Notification No. SO 290 dated 1/12/97.

The UCCI subsequently constituted a Trust in 2002 named as Udaipur Industrial Waste Management and Research Centre (The Trust) under the Chairmanship of district Collector, Udaipur for development of disposal facility on set apart land. On request of the UCCI, the detailed feasibility for the development of Hazardous Waste Disposal Project was conducted by M/s. SENES Consultants Ltd. and M/s. HMJ Associates, Canada during the year 2002-2003. Besides, M/s SENES Consultant Ltd also conducted detailed EIA of the site, for development of disposal facility.

As per the provisions of section 8 (4) of HWMR, 1989, a public hearing was conducted on dated 7.5.2005 for approval of the site for development of disposal facility. The State Board forwarded the proceedings of the public hearing and EIA report to the State Govt. for approval of the site as required under section 8(5) of the rule. The State Government after examining the recommendations of the State Board, EIA report and record of the public hearing granted approval of the site under sections 8(6) of the rules vide letter dated 15.7.05.

Subsequent to approval of the site, the Trust submitted application for consent to establish under the provisions of Water Act, 1974 and Air Act, 1981 for establishment of disposal facility at the approved site under the name of Rajasthan Waste Management Trust. The State Board, after examination of applications granted consent to establish for development of disposal facility vide letter dated 28.7.05

The Trust subsequently selected M/s. Ramky Enviro Engineers Ltd. Hyderabad for development of disposal facility on BOT basis at envisaged cost of Rs. 18 Crores. The breakup of total capital cost as envisaged by M/s. Ramky is given as under:-

S.No.	Particulars	Rs. in Crore
1	Land & Building	1.50
2	Land fill Pits	6.50
3	Incinerator	6.00
4	Lab & Testing Equipments	1.00
5	Vehicles	1.00
6	Pre Operative expenses	0.85
7	Contingencies, working capital margin etc.	0.45
	Total	**18.00**

The work of development of 1st Phase of the CTSDF is completed and commissioned in the end of October 06. M/s. Ramky has also started collection of hazardous waste of the member industries for its disposal in the SLF developed with the facility. The State Board has also granted authorization vide letter dated 19/7/2006 under section 5 of the rules.

M/s. Ramky also have to install incinerator of 2000 MTA capacity for incineration of incinerable hazardous waste. But the generation of such waste is very less and CTSDF has received only 760 MT of such type of waste in two years, therefore the said incinerator has not been installed. The Ramky has been directed to dispose the Incinerable waste collected and stored at their premises. The ramky has also been install the incinerator with the facility.

5.36 West Bengal

The first Common Storage, Treatment and Disposal Facility (CSTDF) for hazardous waste under the Public Private Partnership (PPP) has been developed at Haldia. It is a joint venture project of Haldia Development Authority (HDA) and M/s Ramky Enviro Engineers Limited.

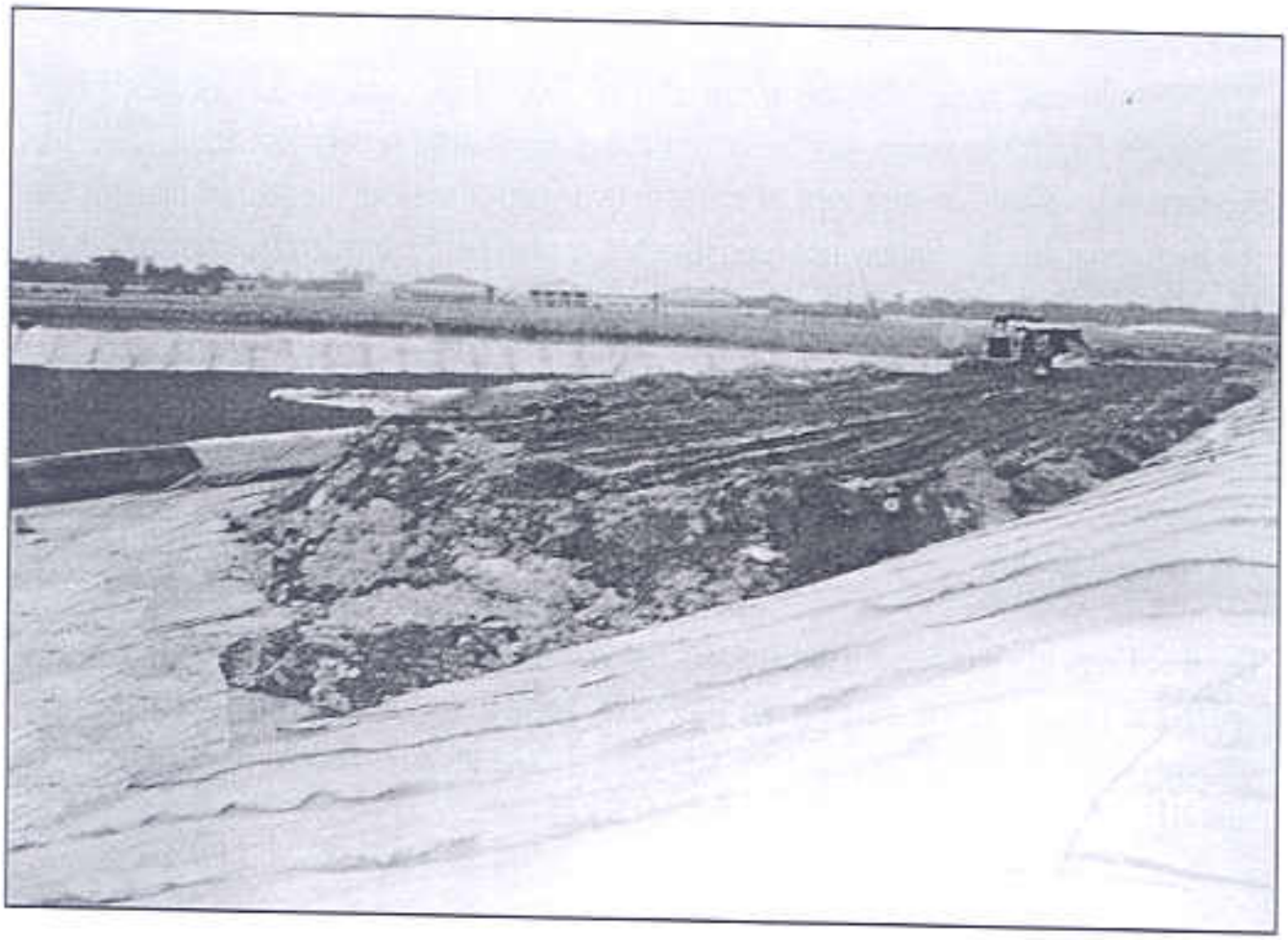
In April 2003, the Haldia Development Authority (HDA) and M/s Ramky Enviro Engineers Limited formed a joined venture company under the name and style of M/s West Bengal Waste Management Limited to develop and operate the integrated waste management complex for taking care of the industrial hazardous wastes from the entire state of West Bengal.

The land for the Common Hazardous Waste Storage, Treatment and Disposal Facility (CHWSTDF) with an area of 70.46 acres is being developed at Mouza Purba Srikrishnapur, J.L. No. 103, P.S. Sutahata, District Purba Medinipur. The total land requirement is 200 acres for Phase I and II. Out of this, 70.46 acres has been acquired and is being utilised for the development of the landfill facility. Temporary storage facility, laboratory and other

infrastructure is under Phase I and installation of incinerator is under Phase II. The life of the landfill facility is 30 years.

The WBPCB issued NOC for the facility on April 28, 2004. After a public hearing on July 30, 2004, the Department of Environment, Government of West Bengal issued environmental clearance on October 18, 2004. Site notification was done by the Government of West Bengal on October 18, 2004.

The total amount of hazardous wastes to be landfilled at the site is 1,20,000 tonnes per annum. In addition, 60,000 tonnes per annum of hazardous wastes can be stabilized and treated and 20,000 tonnes per annum of hazardous wastes can be incinerated. The total project cost for the CHWTSDF is given in Table below.



1st Cell of the Common Land Fill facility at Haldia (In operation)

Table : Source of Finance for CHWSTDF at Haldia

Source	Amount
Promoters equity	**Rs. 20 crores**
M/s. Ramky Enviro Engineers Ltd.	Rs. 10 crores
HDA	Rs. 32 lakhs
Others	Rs. 32 lakhs
Deposits	Rs. 936 lakhs
Grant	**Rs. 11 crores**
MoEF	Rs.2 crores
State Govt.	Rs.2 crores
HDA	Rs. 7 crores
Term loans from financial institutions	**Rs. 23 crores**

Out of the financial assistance of Rs. 4 crores, the MoEF, GoI would grant Rs. 2 crores and the State Government would grant Rs. 2 crores. A Memorandum of Understanding was signed on January 31, 2006 between MoEF, GoI, WBPCB and M/s West Bengal Waste Management Limited. Accordingly, both the WBPCB and the MoEF had released Rs. 80 lakhs each to the West Bengal Waste Management Ltd. as the 1st installment.

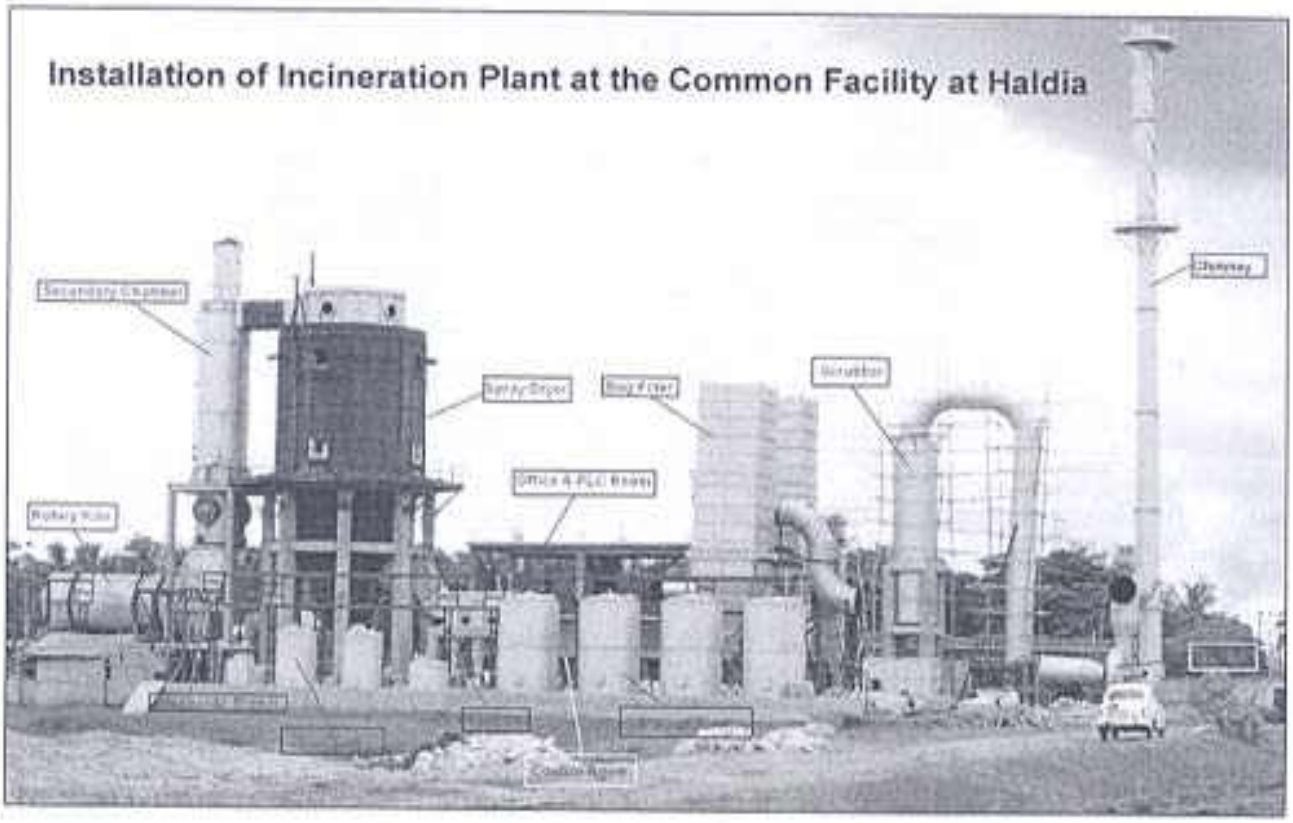
The West Bengal Pollution Control Board has constituted a technical committee comprising representatives of various industry associations, engineering institutions ,Environment Department, Govt. of West Bengal, etc., to review the membership fee and the cost for the treatment and disposal of the hazardous wastes at the CHWTSDF, Haldia. Inclusion of different industry association in the committee facilitates the process of joining of the individual units, specially the tiny ones (belonging to the individual association) as members of the CHWTSDF. The Operator of the Facility has accepted the recommendation of the Committee regarding the lowering of the membership fee for the tiny sector in order to reduce the economic burden on them as well as to encourage them to become members. The said Technical Committee has agreed upon the following cost structure for the treatment and disposal of hazardous wastes.

Cost for Treatment & Disposal of One(1) Tonne of Waste:

Type of Treatment	Cost (Rs.)
Land filling	990.00
Stabilization	1,597.00
Incineration	18,500.00

Note: Transportation Cost is Rs. 4.00 / Km. The transportation of the haz. waste may also be arranged by the member industry by own transport arrangement provided the

transporter should obtain the Authorization from the WBPCB for the transportation of the haz. waste and also comply with the provisions of the Motor Vehicles Rules.



Presently, 300 units have taken membership of the CHWTSDF at Haldia. More and more units are being persuaded by the State Board to join the facility. The State Board has been sensitive to the needs of the industries, particularly to the small scale sector and revised membership fees reflecting lower fees for the smaller units have been introduced by the operator of the facility.

Units with Captive Hazardous Waste Incinerator :

Name & Address	Capacity	Incinerates
I.O.C.L.-Haldia Refinery Haldia, Dist. E. Midnapore	50 kg/hr	Oil sludge
MCC-PTA Sutahata, Haldia, Dist. E. Midnapore	40 TPD	Organic residues & ETP sludge
Bristol Petroleum Budge Budge, Dist. South 24 Parganas	500 kg/hr	Bottom residue, spent clay & ETP sludge
Haldia Petrochemicals Sutahata, Haldia, Dist. E. Midnapore	220 kg/hr. – oily wastes 35 kg/hr. – liquid wastes	Oily wastes & liquid wastes

Chapter 6
Recommendations

6.1 Recommendations

After going through the data submitted by the SPCBs / PCCs, following recommendations are hereby made

- Majority of the SPCBs / PCCs need to rectify and prepare the 'Inventory of Hazardous Waste Generating Industries and HW Management' in light of the guidelines prepared by CPCB and standard formats already circulated to them. It must be undertaken on a regular basis and status as on April of every coming year be prepared under an intimation to CPCB and MoEF.

- The States which lack in respect of common TSDF / common incinerator(s) for the disposal of land disposable and Incinerable wastes , must undertake this work on top priority.

- The capacities of the common TSDF in the States of Gujarat, Maharashtra , Punjab Rajasthan , Tamilnadu and West Bengal, are not adequate to accommodate the present quantities of land disposable HW. These must be augmented to handle the present and future quantities of this category of HW.

- The capacities of the facilities to properly handle the incinerable waste in the States of Madhya Pradesh, Maharashtra , Rajasthan , Uttar Pradesh , Daman, Diu & DNH and West Bengal may be augmented by way of installation of new incinerators (common/ captive). This will take care of both present as well as future quantities.

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