READY RECKONER ON MUNICIPAL SOLID WASTE MANAGEMENT FOR URBAN LOCAL BODIES

Commissionerate of Municipal Administration
Chennai - 600 005
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FOREWORD

The rate of urbanization in Tamil Nadu has increased manifold, as compared to other States in the country. Therefore, it is imperative that adequate infrastructure facilities be provided in urban areas to keep pace with the growth in population. Needless to say, the problem of Solid Waste Management in urban areas is among the major challenges faced by the local bodies in recent times. Over the years, the quantum of waste generated has accelerated with urbanization.

Solid Waste Management is one of the primary functions of the urban local bodies. In order to scientifically handle and dispose solid waste, a number of measures are being implemented by the local bodies.

This Ready Reckoner on Solid Waste Management has been prepared, based on the Municipal Solid Waste (Management and Handling) Rules 2000 and the Manual on Municipal Solid Waste Management by the Central Public Health & Environmental Engineering Organisation (CPHEEO) with a view to sensitising the municipal authorities of the steps that are needed to be implemented for the effective management of solid waste. The compendium explains the types and characteristics of municipal solid waste, the objectives of municipal solid waste management systems and the normative standards for primary and secondary collection, transportation, processing and disposal of solid waste, landfill operations, specifications of tools, equipments and vehicles in Urban Local Bodies.

This compendium encompasses a comprehensive overview of the systematic steps, which need to be taken, for sustainable solid waste management in urban centres. It is hoped that this will encourage officials in streamlining and strengthening solid waste management practices across the State.

Chennai-5,
17.11.2008.

Dr. Niranjan Mardi,
Commissioner of Municipal Administration.

ACKNOWLEDGEMENT

Tamil Nadu is one among the most urbanized states in India with 43.86% of its populace living in urban areas. Population growth has enhanced the quantum of waste generation, leading to an increase in the level of pollution. Accumulation of solid waste, especially Municipal Solid Waste (MSW), is a matter of growing concern in urban areas and this problem has aggravated due to the absence of proper disposal plans.

Urban Local Bodies are normally responsible for solid waste collection and disposal. But the magnitude of the problem is well beyond the ability of the smaller local bodies. Therefore, it is essential to devise suitable mechanisms for developing integrated solid waste management systems in all the towns and cities, comprising source reduction, segregation including other important components like collection, transportation, processing and sanitary landfill operations.

This Ready Reckoner on Solid Waste Management has been prepared, based on the Municipal Solid Waste (Management & Municipal Handling) Rules, 2000 and the Manual on Municipal Solid Waste Management by the Central Public Health & Environmental Engineering Organization (CPHEEO). The photographs contained in this book display some of the best practices adopted in the local bodies in Tamil Nadu.

Dr. Niranjan Mardi, I.A.S, Commissioner of Municipal Administration, has been the source of inspiration for preparing this compendium, and had offered valuable suggestions, for which I will remain ever grateful. Many experts in the field of Solid Waste Management and Officers of the Commissionerate of Municipal Administration provided support, and encouragement during the course of my preparing this book. I convey my sincere thanks to all of them.

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Chennai-5
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ABBREVIATIONS

3R	Reduce, Reuse, and Recycle
AMC	Annual Maintenance Contract
BMW	Biomedical waste
BOO	Build, Own, and Operate
BOOT	Build, Own, Operate, and Transfer
BOT	Build, Operate, and Transfer
CBO	Community Based Organization
CDM	Clean Development Mechanism
CEE	Centre for Environment Education
CEE-ERU	Centre for Environment Education Ecofriendly Reuse and Recycling Unit
CER	Certified Emission Reduction
CIDCO	City and Industrial Development Corporation
CLA	Contract Labor (Regulation and Abolition) Act 1970
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organisation
DBO	Design, Build, and Operate
DGS&D	Director General of Supplies and Disposal
EPA	Environment Protection Act 1986
GHG	Green House Gas
IEC	Information, Education, and Communication
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forest
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
NEERI	National Environmental Engineering Research Institute
NGO	Non Governmental Organization
NIMBY	Not In My BackYard
O&M	Operation and Maintenance
PCB	Pollution Control Board
RWA	Resident Welfare Association

SWM	Solid Waste Management
TNPCB	TamilNadu Pollution Control Board
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
ULB	Urban Local Body
UNEP	United Nations Environment Programme

Unit Equivalents

1 Crore	=	10 million or 100 lakhs
1 Lakhs	=	100,000

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COMMISSIONERATE OF MUNICIPAL ADMINISTRATION

READY RECKONER ON IMPLEMENTATION OF SOLID WASTE MANAGEMENT IN URBAN LOCAL BODIES

1 INTRODUCTION:

The Solid Waste Management (SWM) is one of the important obligatory functions of the urban local bodies in India. It is also one of the primary responsibilities of the municipal authorities. Over the years, the quantum of waste generated by different category of waste producers (Households, Commercial centers, Institutions, Industries etc) has been increasing keeping in pace with the increase in urbanization, population growth and associated activities. The characteristics of the waste generated have also been varying with the habits of human being.

India's population as per 2001 census was 1027 million, of which the urban population was 285.35 million or 27.87% of the total population residing in 5161 cities and towns. After independence, while the population of India has increased three times, the urban population has increased five times. The urban population has increased from 17.3% of the total population in the year 1951 to 27.8% in 2001. It is expected to increase to about 432.61million or 32.3% by 2021 AD and 534.8 million or 38.2% by 2026 AD.

Tamil Nadu is one among the most urbanized States in India with 43.86% of state population living in urban areas. The rate of urbanization in Tamil Nadu has doubled from about 22% in 1961 to the present level in 2001. The State is therefore, facing a challenge of providing essential infrastructure in urban centers to keep pace with population growth. Solid waste management is one among the major challenges faced by the state governments in urban areas.

Rapid urbanization has led to over-stressing urban infrastructure services including Municipal Solid Waste Management because of poor resources and inadequacies of the existing systems. Therefore, augmentation of the solid waste management facilities and their operation & maintenance in a sustainable manner by urban local bodies would require huge capital investment, introduction of latest technologies which are cost effective. Public-Private Partnership (PPP) in waste management and introduction of appropriate waste management practices are needed in order to prevent urban waste causing environmental pollution and health hazards.

The issues relating to transportation of Municipal Solid Waste (MSW) as of now, provide a scenario where there is manual and multiple handling of waste, low collection efficiency, ineffective use of available carrying capacity, accumulation of huge waste at open collection points and open transportation of waste etc.

The mandatory requirement of Municipal Solid Waste Rules 2000 describes compliance criteria to be adopted by the State and the Municipal Bodies on different activities relating to Municipal Solid Waste Management (MSWM). Therefore, there is a need to evolve guidelines uniform in all respects relating to the different activities under MSWM which can be benchmarked for adoption by different urban local bodies in the State. These guidelines provide for the achievement of the objectives of reducing the problems of health, sanitation and environmental hazards caused by the solid wastes and making the cities and towns better places to live.

2 MUNICIPAL MANAGEMENT

2.1 FUNCTIONS OF URBAN LOCAL BODIES

The major functions of Urban Local bodies in India are;

1. Water supply
2. Public Health & Sanitation
3. Solid Waste Management
4. Provision of Streetlights and
5. Laying of Roads and Storm water Drain

This Ready Reckoner attempts to provide valuable insights in the Municipal Solid Waste Management.

3 SOLID WASTE

A waste is viewed as a discarded material, which has no consumer value to the person abandoning it. According to World Health Organisation, (WHO) the term 'solid waste' is applied to unwanted and discarded materials from houses, street sweepings, commercial and agricultural operations arising out of mass activities.

Solid Waste is the term used to describe non liquid materials arising from domestic, trade, commercial, agricultural and industrial activities and from public services. It is commonly known as garbage, refuse, rubbish or trash. Its main sources are residential premises, business establishments, and street sweepings. It is a mixture of vegetable and organic matter; inert matter like glass, metal, stones, ashes, cinders, textiles wood, grass etc., According to the percentage of the ingredient, it would be highly compostable, or combustible, biodegradable or inert.

3.1 SOLID WASTE MANAGEMENT

Solid Waste Management is a science associated with the management of generation, storage, collection, transportation, processing and disposal of solid waste using the best principle and practices of public health, economics, engineering, conservation, aesthetics and other environmental conditions.

Solid Waste Management is one of the important obligatory functions of urban local bodies in India. It is also one of the primary responsibilities of the municipal authorities. Over the years, the quantum of waste generated by different category of waste producers (Households, Commercial centres, Institutions, Industries etc) has been increasing with the increase in urbanization, population growth and associated activities. The characteristics of the waste generated have also been varying with the habits of human being.

Solid Waste Management is a part of public health and sanitation, and according to the Indian Constitution, falls within the purview of the State list. Since this activity is non-exclusive, non-rivaled and essential, the responsibility for providing the service lies within the public domain. The activity being of a local nature is entrusted to the Urban Local Bodies. The Urban Local Body undertakes the task of solid waste service delivery, with its own staff, equipment and funds. In a few cases, part of the said work is contracted out to private enterprises.

3.2 SOURCES AND CLASSIFICATION OF SOLID WASTE

Based on the source, origin and type of waste a comprehensive classification is described below:

3.2.1 Domestic/Residential Waste

This category of waste comprises of the solid wastes that originate from single and multi-family household units. These wastes are generated as a consequence of household activities such as cooking, cleaning, repairs, gardening, redecoration, empty containers, packaging, clothing, old books, newspaper, old furnishings etc., The Households also discard bulky wastes such as furniture and large appliances which cannot be repaired and re-used.

3.2.2 Municipal Waste

Municipal waste includes wastes resulting from municipal activities and services such as street waste, dead animals, market waste and abandoned vehicles. However, the term is commonly applied in a wider sense to incorporate domestic wastes, institutional wastes and commercial wastes.

3.2.3 Commercial Waste

Included in this category are solid wastes that originate in offices, wholesale and retail stores, restaurants, hotels, markets, warehouses and other commercial establishments. Some of these wastes are further classified as garbage and others as rubbish. Waste generated at business premises, shops, offices, markets, departmental stores (paper, packing material, spoiled, discarded goods) can be classified as organic, inorganic, chemically reactive and hazardous waste.

3.2.4 Institutional Waste

The Institutional wastes are those arising from institutions such as schools, universities, hospitals, research institutes etc. It includes wastes, which are classified as garbage and rubbish, as well as wastes that are considered to be hazardous to public health and to the environment.

3.2.5 Garbage

The Garbage is the term applied to animal and vegetable wastes resulting from the handling, storage, sale, preparation, cooking and serving of food. Such wastes contain putrescible organic matter, which produces strong odours and therefore attracts rats, flies and other vermin. It requires immediate attention in its storage, handling and disposal.

3.2.6 Rubbish

Rubbish is a general term applied to solid wastes originating in households, commercial establishments and institutions, excluding garbage and ashes.

3.2.7 Ash

Ashes are the residues from the burning of wood, coal, charcoal, coke and other combustible materials, for cooking and heating in houses, institutions and small industrial establishments. When produced in large quantities at power generating plants and factories these wastes are classified as industrial wastes. Ashes consist of a fine powdery residue, cinders and clinker often mixed with small pieces of metal and glass.

3.2.8 Bulky Waste

This category includes all bulky household wastes, which cannot be accommodated in the normal storage containers of households. For this reason they require special collection. In developed countries bulky wastes include large household appliances such as cookers, refrigerators and washing machines as well as furniture, crates, vehicle parts, tyres, wood, trees and branches. Metallic bulky wastes are sold as scrap metal but some portion is disposed of at sanitary landfills.

3.2.9 Street Waste

This term applies to wastes that are collected from streets, walkways, parks and vacant lots. In the more affluent countries manual street sweeping has virtually disappeared but it still commonly takes place in developing countries, where littering of public places is a far more widespread and acute problem. Mechanised street sweeping is predominantly practiced in the developed countries. The Street wastes include paper, cardboard, plastic, dirt, dust, leaves and other vegetable matter.

3.2.10 Dead Animal

This category includes dead animals that die naturally or accidentally killed. It does not include carcass and animal parts from slaughter houses which are regarded as industrial waste. Dead animals are divided into two groups, large and small. Among the large animals are horses, cows, goats, sheep, etc. Small animals include dogs, cats, rabbits, rats etc. The reason for this differentiation is that large animals require special equipment for lifting and handling during removal. If not collected and removed promptly with due care, dead animals are a threat to public health as they attract flies and other vermin as they putrefy. Their presence in public places is particularly offensive and emits foul smell from the aesthetic point of view.

3.2.11 Construction and Demolition Waste

The Construction and demolition wastes are generated due to the construction, repair and demolition of houses, commercial buildings and other structures. This waste primarily consists of earth, stones, concrete, bricks, lumber, roofing materials, plumbing materials, heating systems and electrical wires etc. This forms the major chunk of municipal waste and when generated in large scale at building and demolition sites, it is generally removed by contractors for filling up low lying areas and by urban local bodies for disposal at landfills.

3.2.12 Industrial Waste

This category consists of the discarded solid material out of manufacturing processes and industrial operations. This covers a vast range of substances, which are unique to each industry. Normally industries produce hazardous and non hazardous wastes which they must dispose off by following standards laid down under The Hazardous Waste (Management & Handling)rules,1989 amended in 2000 and 2003. (*http://www.tnpcb.gov.in/enforcement.asp* (or) *http://dpcc.delhigovt.nic.in/act_hazardous.htm*) framed by the Government of India and directions given by CPCB and by the TamilNadu Pollution Control Board (*http://www.tnpcb.gov.in*) For this reason industrial wastes are considered separately from municipal wastes. It has to be noted, however, that solid wastes from small industrial plants and ash from power plants are frequently disposed off at municipal landfills creating environmental pollution and subsoil contamination.

3.2.13 Bio medical waste

Management of biomedical waste is governed by The Bio Medical Waste (Management &Handling) Rues, 1998 as amended in 2000. Hospitals treating more than 1000 patients are required to register themselves with State Pollution Control Board. Hospitals/research laboratories shall be responsible for proper collection, reception, treatment, storage and disposal of bio medical waste. Under the Bio Medical Waste rules, the waste producer is responsible for managing the waste. Each generator is expected to store the bio medical waste from municipal waste and to keep different categories of bio medical waste in colour coded bags/containers as prescribed in the Bio Medical Waste (Management &Handling) Rues, 1998.

3.2.14 Hazardous Waste

Hazardous wastes may be defined as wastes of industrial, institutional or consumer origin which, because of their physical, chemical or biological characteristics cause potential danger to humanity and the environment. In some cases although the active agents may be liquid or gaseous, they are classified as solid wastes because they are confined in solid containers. Typical examples are: solvents, paints, pesticides etc., whose used containers frequently get mixed with municipal wastes and become part of the urban waste stream. Certain hazardous wastes cause explosions in incinerators and causes

fire at landfill sites. Others, such as pathological wastes from hospitals and radioactive wastes, require special handling at all times. The good management practice should ensure that the hazardous wastes are stored at source, collected, transported and disposed off with caution separately, preferably after effecting suitable treatment to render them innocuous

3.2.15 Sewage Waste

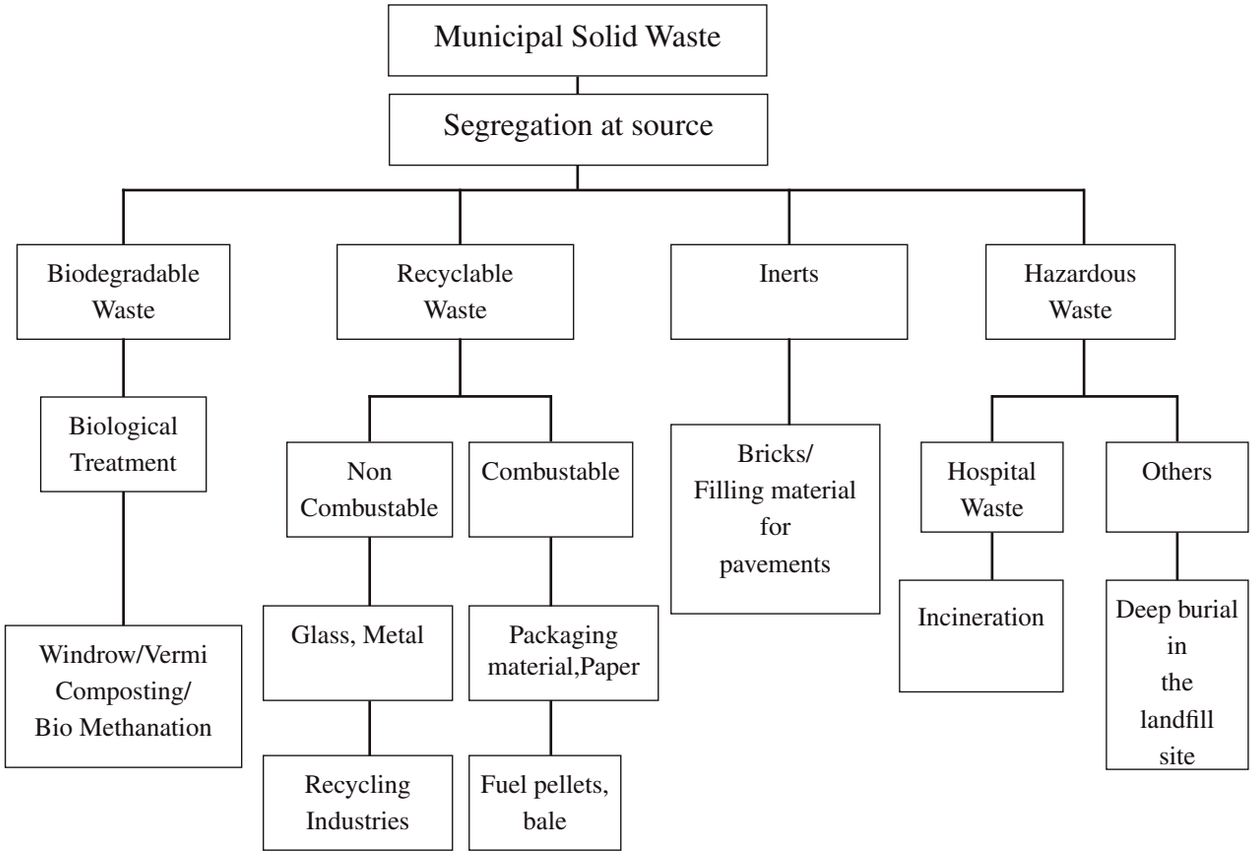
The solid by-products of sewage treatment are classified as sewage wastes. They are mostly organic and derived from the treatment of organic sludge from both the raw and treated sewage. The inorganic fraction of raw sewage such as grit is separated at the preliminary stage of treatment. As it contains putrescible organic matter which may contain pathogens, they must be buried /disposed off without delay.

Gist on different types and sources of waste are described in Table 1

Table 3. 1: Types and sources of solid waste

Domestic waste	Household Waste-Kitchen, house cleaning, old papers, packing, bottles, crockery wares, furnishing materials, garden trimmings etc.,
Commercial Waste	Waste generated at business premises, shops, offices, markets, departmental stores(paper, packing material, spoiled, discarded goods)organic, inorganic, chemically reactive and hazardous waste
Institutional Waste	Schools, Colleges, Hospitals, large hotels and restaurants, markets selling vegetables, fruits, fish etc., community halls, religious places, function sites etc.,
Street Sweeping	Unconcerned throwing, littering made by pedestrian traffic, vehicular traffic, stray animals, roadside tree leaves, rubbish from drain cleaning, debris etc.,
Industrial/Trade Waste	Waste generated through manufacturing and material processing.
Debris or Construction rejects	Comprises earth, brickbats, stones, wooden logs etc.,
Bio Medical Waste	Animal waste such as animal tissues, organs, body parts, carcasses, bleeding parts, fluid, blood, waste generated by veterinary hospitals, colleges, discharge from hospitals, animal houses and Microbiology/ biotechnology laboratories, Waste sharps viz., needles, syringes, scalpels, blades, glass etc. that may cause puncture and cuts. This includes both used and unused sharps etc.,
Hazardous Waste	Waste with properties that make it dangerous or potentially harmful to human health or the environment. Waste listed in Hazardous waste management rules 1989.(batteries, cleaning fluids, pesticides etc.,)
Sewage Waste	Sewage is the liquid waste containing some solids produced by humans which typically consists of washing water, faeces,urine, laundry waste and other material.

Types and Treatment of Waste



4 GENERATION OF SOLID WASTE

As indicated in the Manual on Municipal Solid waste Management published by CPHEEO, Ministry of Urban Development (*http://cpheeo.nic.in*) and Report of the Technology Advisory Group on Solid Waste Management constituted by Ministry of Urban Development, New Delhi, the per capita waste generation varies from 0.2 to 0.6kg per day in cities with a population ranging from 0.1 million and above. Due to increase in per capita waste generation of about 1.3% per year, and growth of urban population between 3% to 3.5% per annum, yearly increase in the overall quantity of solid waste generation in the cities averages about 5%.

The waste generation rates and physical and chemical characteristics of 59 cities covered under JnNURM are given as under.

Table 4.1 Waste generation rates and Characteristics of MSW in 59 Cities

S. No	Name of City	Population (As per 2001 census)	Area (Sq. Km)	Waste Quantity (TPD)	Waste Generation Rate (kg/c/day)	Compo stables (%)	Recyclables (%)	HCV* (Kcal/ Kg)
1	Kavaratti	10,119	4	3	0.3	46.01	27.2	2242
2	Gangtok	29,354	15	13	0.44	46.52	16.48	1234
3	Itanagar	35,022	22	12	0.34	52.02	20.57	3414
4	Daman	35,770	7	15	0.42	29.6	22.02	2588

5	Silvassa	50,463	17	16	0.32	71.67	13.97	1281
6	Panjim	59,066	69	32	0.54	61.75	17.44	2211
7	Kohima	77,030	30	13	0.17	57.48	22.67	2844
8	Port Blair	99,984	18	76	0.76	48.25	27.66	1474
9	Shillong	1,32,867	10	45	0.34	62.54	17.27	2736
10	Simla	1,42,555	20	39	0.27	43.02	36.64	2572
11	Agartala	1,89,998	63	77	0.4	58.57	13.68	2427
12	Gandhinagar	1,95,985	57	44	0.22	34.3	13.2	698
13	Dhanbad	1,99,258	24	77	0.39	46.93	16.16	591
14	Pondicherry	2,20,865	19	130	0.59	49.96	24.29	1846
15	Imphal	2,21,492	34	43	0.19	60	18.51	3766
16	Aizwal	2,28,280	117	57	0.25	54.24	20.97	3766
17	Jammu	3,69,959	102	215	0.58	51.51	21.08	1782
18	Dehradun	4,26,674	67	131	0.31	51.37	19.58	2445
19	Asansol	4,75,439	127	207	0.44	50.33	14.21	1156
20	Kochi	5,95,575	98	400	0.67	57.34	19.36	591
21	Raipur	6,05,747	56	184	0.3	51.4	16.31	1273
22	Bhubaneswar	6,48,032	135	234	0.36	49.81	12.69	742
23	Tiruvanantapuram	7,44,983	142	171	0.23	72.96	14.36	2378
24	Chandigarh	8,08,515	114	326	0.4	57.18	10.91	1408
25	Guwahati	8,09,895	218	166	0.2	53.69	23.28	1519
26	Ranchi	8,47,093	224	208	0.25	51.49	9.86	1060
27	Vijaywada	8,51,282	58	374	0.44	59.43	17.4	1910
28	Srinagar	8,98,440	341	428	0.48	6177	17.76	1264
29	Madurai	9,28,868	52	275	0.3	55.32	17.25	1813
30	Coimbatore	9,30,882	107	530	0.57	50.06	15.52	2381
31	Jabalpur	9,32,484	134	216	0.23	58.07	16.61	2051
32	Amritsar	9,66,862	77	438	0.45	65.02	13.94	1836
33	Rajkot	9,67,476	105	207	0.21	41.5	11.2	687
34	Allahabad	9,75,393	71	509	0.52	35.49	19.22	1180
35	Vishakhapatnam	9.82,904	110	584	0.59	45.96	24.2	1602
36	Faridabad	10,55,938	216	448	0.42	42.06	23.31	1319
37	Meerut	10,68,772	142	490	0.46	54.54	10.96	1089
38	Nashik	10,77,236	269	200	0.19	39.52	25.11	2762
39	Varanasi	10,91,918	80	425	0.39	45.18	17.23	804
40	Jamshedpur	11,04,713	64	338	0.31	43.36	15.69	1009
41	Agra	12,75,135	140	654	0.51	46.38	15.79	520
42	Vadodara	13,06,227	240	357	0.27	47.43	14.5	1781
43	Patna	13,66,444	107	511	0.37	51.96	12.57	819
44	Ludhiana	13,98,467	159	735	0.53	49.8	19.32	2559

45	Bhopal	14,37,354	286	574	0.4	52.44	22.33	1421
46	Indore	14,74,968	130	557	0.38	48.97	12.57	1437
47	Nagpur	20,52,066	218	504	0.25	47.41	15.53	2632
48	Lucknow	21,85,927	310	475	0.22	47.41	15.53	1557
49	Jaipur	23,22,575	518	904	0.39	45.5	12.1	834
50	Surat	24,33,835	112	1000	0.41	56.87	11.21	990
51	Pune	25,38,473	244	1175	0.46	62.44	16.66	2531
52	Kanpur	25,51,337	267	1100	0.43	47.52	11.93	1571
53	Ahmedabad	35,20,085	191	1302	0.37	40.81	11.65	1180
54	Hyderabad	38,43,585	169	2187	0.57	54.2	21.6	1969
55	Banglore	43,01,326	226	1669	0.39	51.84	22.43	2386
56	Chennai	43,43,645	174	3036	0.62	41.34	16.34	2594
57	Kolkata	45,72,876	187	2653	0.58	50.56	11.48	1201
58	Delhi	1,03,06,452	1483	5922	0.57	54.42	15.52	1802
59	Greater Mumbai	1,19,78,450	437	5320	0.45	62.44	16.66	1786

4.1 NORMS FOR GENERATION OF GARBAGE

Table 4.2 Norms for Garbage generation

Garbage generated	Average Waste
(1) Population range upto 1 lakh (2) Population range 1 to 5 lakh (3) Population range 5 to 10 lakh (4) Population range 10 to 20 lakh	**0.27 Kg per person per day** **0.31 Kg per person per day** **0.45 Kg per person per day** **0.67Kg per person per day**
Street sweepings and drain silt	**0.10 Kg per person per day**
Slaughter House: (1) Small slaughter house (2) Medium slaughter house (3) Large slaughter house	 **0.5 to 1.0 ton per day** **2 to 6 ton per day** **6 to 7 ton per day**
Domestic waste from Hospitals/ Clinics	**1.1 Kg per bed per day**

The per capita generation of the above combined waste would not be more than 405 gm/capita/ day in areas with a density of population less than 20000/sq.km. In unsewered areas, the quantity of waste may be higher due to the presence of surface drain sludge. The Local Body has to arrange for the primary collection from the different places where the solid waste is generated and stored and this collection is to be done on a daily basis by different methods.

5. CHARACTERISTICS OF MUNICIPAL SOLID WASTE

Based on the characterization study conducted in various Indian cities by National Environmental Engineering Research Institute (NEERI) during 1996, the physical and chemical characteristics of Municipal Solid Waste have been presented in Table 5.1 and Table 5.2.

Table 5.1 Physical Characteristics of Municipal Solid Wastes in Indian Cities

Population range (In Million)	Number of Cities surveyed	Paper	Rubber, Leather and Synthetics	Glass	Metals	Total Compostable matter	Inerts
0.1 to 0.5	12	2.91	0.78	0.56	0.33	44.57	43.59
0.5 to 1.0	15	2.95	0.73	0.35	0.32	40.04	43.59
1.0 to 2.0	9	4.71	0.71	0.46	0.49	38.95	44.73
2.0 to 5.0	3	3.18	0.48	0.48	0.59	56.67	49.07
> 5.0	4	6.43	0.28	0.94	0.80	30.84	53.90

Table 5.2 Chemical Characteristics of Municipal Solid Wastes in Indian Cities

Population range(In Million)	Number of Cities surveyed	Moisture	Organic Matter	Nitrogen Vs Total Nitrogen	Phosphorous as P2O3	Pottassium as K2O	C/N Ratio	Calorific Value in kcal/kg
0.1 to 0.5	12	25.81	37.09	0.71	0.63	0.83	30.94	43.59
0.5 to 1.0	15	19.52	25.14	0.66	0.56	0.69	21.13	43.59
1.0 to 2.0	9	26.98	26.89	0.64	0.82	0.72	23.68	44.73
2.0 to 5.0	3	21.03	25.6	0.56	0.69	0.78	22.45	49.07
> 5.0	4	38.72	39.07	0.56	0.52	0.52	30.11	53.90

PHYSICAL COMPOSITION OF MUNICIPAL SOLID WASTE

As per the survey conducted by CPCB during 2005, the physical composition of municipal solid waste in India is detailed below.

Table 5.3 Comparison of physical composition of MSW between 1996 and 2005

Composition (%)								
Year	Bio degradable	Paper	Plastic/rubber	Metal	Glass	Rags	Others	Inerts
1996	42.21	3.63	0.60	0.49	0.60	-	-	45.13
2005	47.43	8.13	9.22	0.50	1.01	4.49	4.016	25.16

(Source: For 1996 results-NEERI,1996, and for 2005, http://www.cpcb.nic.in)

6 MSW RULES, 2000 – A BRIEF HISTORY

SUPREME COURT DIRECTIVES

In view of the poor situation of solid waste management practices adopted in the country with no immediate solution, a public interest litigation (Writ Petition No.888 of 1996) was filed in the Hon'ble Supreme Court of India by M/s.Almitra H Patel& another Vs Union of India &Others, seeking directions from the Hon'ble Supreme Court of India to the Urban LocalBodies as well as the Government

of India and other State Governments in the country, for improving solid waste management practices expeditiously.

The Hon'ble Supreme Court of India ordered to constitute a committee to look into all aspects of solid waste management and requested to give its report not later than 30th June,1998.

The TOR(Terms of Reference) for this committee were as under:

1. Examine the existing practices and to suggest hygienic processing and waste disposal practices and proven technologies on the basis of economic feasibility and safety which the ULB may directly or indirectly adopt or sponsor
2. Examine and suggest ways to improve conditions in the formal and informal sector for promoting ecofriendly sorting, collection, transportation, disposal, recycling and reuse.
3. To review municipal bye-laws and the powers of localbodies and regional planning authorities and suggest necessary modifications to ensure effective budgeting, financing, administration, monitoring and compliance.
4. Examine and formulate standards and regulations for management of urban solid waste, and set time frames which the authorities shall be found to implement the same.

Pursuant to the order of the Hon'ble Supreme Court of India dated 16.1.2008, the Ministry of Urban Affairs and Employment, Government of India issued Order No.Q-11021/1/97-PHE dated 29th January 1998 regarding the constitution of the committee. The Committee had several sittings and identified the deficiencies in the existing solid waste management system and prepared an Interim Report dated 30-6-1998 recommending the steps to be taken by the Urban Local Bodies.

The Committee had suggested amendments in State laws needed to make solid waste management practices effective and had also suggested to the Government of India to keep the SWM services outside the purview of the Contract Labour (Regulation & Abolition) Act 1970,so as to enable public private partnerships and private sector participation in selected areas of SWM for improving the quality of life in urban areas.

This Committee tabled its report in March, 1999 giving wide ranging recommendations to improve the system of waste management from storage of waste at source to its final disposal. It also covered institutional, financial, legal and health aspects.

In view of the serious environmental degradation resulting from the unscientific disposal of MSW, the Ministry of Environment and Forests (MoEF),Government of India, has notified the '**Municipal Solid Waste (Management and Handling) Rules, 2000**' making it mandatory for ULBs to improve the systems of solid waste management as envisaged in the rules within a given time frame ending 31st December,2003. These rules layout procedures for waste collection, segregation, storage, transportation, processing and disposal. Further, the rules mandate that all cities set up suitable waste treatment and disposal facilities by December 31, 2003 or earlier. These rules also specify standards for compost quality, health control & management and closure of land-fills.

Compliance criteria for each and every stage of waste management-collection, segregation at source, transportation, processing and final disposal are set out in the MSW Rules, which include:

a. Dumping of MSW in Oceans, Rivers, Lakes, Open Spaces and compaction or bailing are not acceptable.
b. The biodegradable waste has to be processed by means of composting, vermi composting, anaerobic digestion or any other appropriate biological processing for stabilization of wastes.
c. Mixed waste containing recoverable resources should be recycled.

In order to understand and implement the guidelines, the definitions of words used, herein, as described in the Municipal Solid Waste (Management & Handling) Rules,2000 is given in Annexure-I.

7 SOLID WASTE MANAGEMENT SYSTEM

The elements of solid waste management system are,

- Waste generation and storage at sorce
- Segregation, reuse and recycling at household level
- Primary waste collection and transportation to to sub depot/transfer station/collection point or community bin
- Street sweeping and cleaning of public places
- Management of collection point/transfer station/sub depot or community bin
- Secondary collection and transportation to processing plant and disposal site
- Processing of solid waste
- Waste disposal in sanitary landfill

7.1 OBJECTIVES OF MSWM

The goal of effective Municipal Solid Waste Management (MSWM) services is to protect public health, the environment and natural resources (water, land, air).

To promote the ecological management of solid waste in compliance with the principle of the 4Rs: Reduce, Reuse, Recycle, Recover and safe disposal.

An effective MSWM service can be achieved only by improving the efficiency of MSWM activities, thereby leading to the reduction of waste generation, separation of MSW and recycling and recovery of materials, and generation of compost and energy.

7.2 PRINCIPLES OF MSWM

The principles which govern the future approach to provision of MSWM services include the following:

a. Promoting awareness of waste management principles among citizens and other stake holders
b. Minimising multiple and manual handling of waste and designing a system to ensure that MSW does not touch the ground till treatment and final disposal
c. Defining the roles and responsibilities of various stakeholders and putting in place an operational frame work, which would include appropriate contractual structures
d. Developing systems for effective resources utilization and deployment
e. Promoting recovery of value from MSW; developing treatment and final disposal facilities, which, while adhering to the statutory requirements are sustainable, environmental friendly and economical.

8 STAGES OF MSWM

These guidelines are developed for the following stages of Municipal Solid Waste Management:-

(1) Segregation and storage at source,
(2) Collection from source,
(3) Transportation from source to intermediate storage points,
(4) Process at intermediate storage points/processing plant, and

(5) Final disposal of different categories of municipal solid waste
(6) Monitoring mechanism

with the vision "THE CITIES AND TOWNS IN TAMILNADU SHALL BE CLEAN WITH HIGH QUALITY OF PUBLIC HEALTH" and expected outcomes shall be:

- **Complete segregation at source as per MSW Rules**
- **100% door-to-door collection**
- **Safe-disposal as per MSW Rules.**

8.1 SEGREGATION AND STORAGE AT SOURCE

8.1.1 STORAGE AT SOURCE

Storage of waste at source is the first essential step of Solid Waste Management. Every household, shop and establishment generates solid waste on day to day basis. The waste should normally be stored at the source of waste generation till collected for its disposal. In India, such a habit has not been formed and in the absence of system of storage of waste at source, the waste is thrown on the streets, treating streets as receptable of waste. Generally no bins for storage of domestic, trade or institutional waste are kept at source. Very few people keep personal bins for storage of domestic, trade or institutional waste at source. Waste from shops, offices and establishments including hospitals, nursing homes, hotels, restaurants, construction and demolition wastes, etc., come on the streets or is disposed of unauthorisedly on public or private open plots or even discharged in the drains or water bodies nearby resulting in clogging of drains, pollution of water resources and increase in insanitary conditions in the urban areas. Some towns in TamilNadu such as Namakkal, have educated the public through intensive Information Education and Communication (IEC) activities which can be adopted in other towns. Some types of receptables presently used for storage are as under:

- Buckets
- Plastic/HDPE/MDPE bins
- Plastic bags
- Metal bins with or without lids

- The segregation and storage of solid waste is the most critical component in the whole process of Municipal Solid Waste Management, which helps in handling solid waste leading to ultimate success of MSWM in terms of the achievements of objectives laid down in the MSW Rules, 2000. The MSW Rules, 2000 describes" ***the littering of municipal solid waste shall be prohibited in cities, towns and in urban areas notified by the State Governments"*** as the compliance criteria on the part of urban local bodies.
- In order to achieve these compliance criteria, the segregation and storage at source becomes the first touchstone for effective management of municipal solid waste. Segregation and storage of solid waste at source will differ from type of solid waste generated by the producers. Broadly the type of solid waste generated can be put into four categories.

  (a) Domestic and Trade waste,
  (b) Construction waste,
  (c) Bio-medical waste, and
  (d) Industrial waste.
- There are separate guidelines formed by different enforcement agencies like Pollution Control Board etc., for dealing with the bio-medical waste and the industrial waste. The present guidelines/Ready Reckoner will be dealing only with the domestic waste, trade

waste and construction waste, which are the main concern of the urban local bodies as far as Municipal Solid Waste is concerned. The generation of awareness among the producers and creation of an enabling environment is the key to success towards proper segregation and storage at source. Therefore, the first step would be to have **extensive awareness and education campaign** to make households realize that the segregation of garbage at source is the best key to solid waste management.

- The awareness campaign should be intensively carried out using all available means of communication including meetings with citizens stakeholders etc. The campaign should be carried over a long period of time, approximately six months to one year, to bring out a change in the perceptions and attitude of the citizens. The campaign should not only cover the segregation into bio-degradable and non-biodegradable categories but also by encouraging the home composting wherever possible at community level. Each Municipality can develop its own communication strategy on this issue. The communication strategy will have also to involve Resident Welfare Associations (RWA), Non Government Organisations (NGO), Merchants, Traders Association, Social Service Organisations, Self Help Groups (SHG) etc. Therefore, it is essential to take up awareness creation campaign involving all the stakeholders in the urban local body ie., elected council members, the RWA's, NGO's, SHG's, Social Service Organisations, the trade representatives, the builders, the municipal staff etc. Different methods for awareness programmes using pamphlets, banners, house-to-house campaign, street meetings, audio-visual aids, propaganda through electronic media, discussions in citizens' forum etc., can be used for creating awareness. The school and college students will also have to be involved in the awareness campaign.
- The segregation of garbage at source is **primarily meant to keep the two broad categories of solid waste generated separately in different containers ie., biodegradable waste in one container(GREEN) and non-biodegradable waste in another container(RED)**. It has been generally observed that the residents are ready to segregate waste at source provided door-to-door collection is done on daily basis at least for wet garbage and on a regular by-weekly or tri-weekly basis for recyclable dry waste. The steps taken by Urban Local Body through awareness campaigns coupled with response of citizens and waste producers should ensure that the storage of these two categories of garbage is done in different containers at source. In order to ensure segregation and storage at source, each producer unit should be provided or encouraged to keep two separate bins for sorting the two different types of solid waste. The capacity of the storage bins will depend on the waste generated by the producer and the frequency of collection of this waste from the producer unit by the urban local bodies or its authorized agency. These two bins should be of different colours for easy adoption by the persons in the waste producer unit.

At present, the segregation of garbage at source is not 100% practiced; it is very difficult to segregate at Transfer station and Treatment site, which leads to various environmental problems. Rag pickers empty the community dust bins located in the streets and spread the contents around for collecting recyclable dry waste, which gives them the source of livelihood. The segregation at source involves a big change of attitude and existing practice among the households, and other producers of solid waste. Therefore motivation of households for taking up segregation at source is the first and the most important step in implementing an effective Municipal Solid Waste Management strategy.

The segregation of garbage at source is to be introduced in a phased manner and the municipality will need to have a pro-active approach involving the different stakeholders and it should be supported by a directive to be given by the Council. **The directive may be in the form of a Council Resolution and it should have adequate strength to enforce in the sense that non-enforcement**

of this directive by the citizens should attract a penalty to be paid by the citizens. However, the penalty provision should be made applicable only after giving reasonable time to the citizens to adopt and get accustomed to the practice of segregation at source, and therefore a provision for lead time should be inbuilt in the system before enforcing penalty provisions. The ULB should also incorporate the **"Providing of TWO BINS within their premises or just outside their premises" by hotels, restaurants, marriage halls, hostels etc., as a condition in the license issued to them under statutory / executive provisions.** The process of segregation and its storage in two different coloured bins i.e., one for degradable and another for non-degradable waste will have to be explained to all RWA's, SHG's and Citizens using different demonstration and audio-visual techniques. Wherever the local municipality thinks fit, the Neighbourhood Groups formed under SJSRY and DWCUA groups may be drawn and used for initially taking up segregation of garbage at source. Each municipality may examine the possibility of involving SHGs/NGOs/CBOs/RWAs also in segregation and if thought fit, slums may also be allotted to them for this activity besides residential colonies initially.

The storage at source follows the step of segregation at source and soon after segregation at source is done; the storage at source will have to be done in two different coloured bins. In general, the Green coloured bin can be used for biodegradable waste and Red coloured bin for non-biodegradable waste at the household and other producing unit levels.

It should be ensured that even after segregation of garbage, the garbage especially of non-biodegradable variety is not thrown on the streets or open spaces or into the drains etc. The areas which have reasonable number of domestic units in its premises like a Housing Society or Association of Flats or Multi-storied buildings etc., community bins should be arranged by either the Municipality on payment basis or by the Society/RWA's for ensuring that two separate community bins are placed in their premises for storage of bio-degradable and non-degradable wastes separately to facilitate the collection of such wastes by the Municipality. **For storage of garbage for use by pedestrians or the floating population, bins should be located at regular intervals.** The bins should be fixed on **"TWO BIN BASIS"** i.e., one for biodegradable waste and the other for recyclable waste. These bins should be fixed in market places and other public places and should be preferably covered bins. Similarly, the bulk producers like markets, hotels, hostels etc., should also provide for two separate bulk containers for storing two different types of solid waste. However, hospitals, nursing homes, maternity centres etc., will have to keep different colour quoted bins in accordance with the directions of pollution control board for storing bio-medical and other related wastes separately and these wastes should not be mixed with the bio-degradable and non-biodegradable municipal solid wastes.

The arrangements for storage of construction wastes should be done by the builder / house owner within their own premises and they should request the municipality to lift this waste separately and for this purpose the municipality can charge the fee for collection of such wastes. The basic objective of the guidelines is to re-design the storage of waste at source, which at present is not being done in the sense that the segregation into different components, can be encouraged among the households so as to process it afterwards for proper disposal.

The Ready Reckoner is suggested with the main objective of encouraging the residents to segregate, store, and deliver Municipal Solid Waste to the primary collection agency, which in most of the cases will be Municipality itself or an agency appointed by the Municipality. **The Ready Reckoner retain the existing structure for waste management and avoid conflict in order to ensure that it is accepted by the society and can be easily implemented.** Thereafter, gradually, a revised structure can be advised if there is a need felt by the Municipality.

Residents would be encouraged to separate, store and deliver the MSW to primary collection staff as per procedures set out by ULBs.

Auto Tippers, tricycles and push carts with separate compartments/containers would be used to enable doorstep collection (residents would be encouraged to deliver waste at doorstep at a pre specified time)

The procurement of tricycles, smaller tippers, and push carts could be done either by the ULB concerned or the SHG/RWA and appropriate contractual arrangements would be entered into with RWA/SHG and put provide operator(s) to carry out primary collection activities.

Door to Door collection of segregated waste

8.2 COLLECTION

The management of solid waste is carried out as a five level operation.

1] Collection from the bins and road sides by the sanitary workers, this level also includes street sweeping operation;
2] The waste from the dust bins and road sides is cleared by the light vehicles
3] The collected waste from the vehicles is transported to the transfer stations or processing plants
4] From the transfer stations or processing plants to the landfill site
5] Processing plants ie, compost plants; the rejects shall be disposed off into the landfill

8.2.1 Primary Collection

Primary collection of waste is the second essential step of Solid Waste Management activity. Primary collection system is necessary to ensure that waste stored at source is collected regularly and it is not disposed of on the streets, drains, water bodies, etc.

a) Door to Door Collection through tricycles/push carts using segregated bins
b) Containers placed on streets and will be collected through autos, tipper lorries, dumper placers and compactors

8.2.2 Tools & Equipments used for primary collection

1. Hand carts/Push carts
2. Tricycles
3. Community bin carrier
4. Motorised vehicles such as autos, smaller tippers

8.2.3 Secondary Collection

Secondary collection of waste is being carried out through Community Bins, Containers placed in Common Collection points (Sub Depot). Waste collected from the house hold will normally be stored in container located in a common place and subsequently it will be transported to processing plant or disposal site.

a) Community Bins, Containers placed in Common Collection points

In addition to the above, collection of solid waste is being done through street sweeping also. The collection of Municipal Solid Waste will have to be done from dispersed sources of its generation / storage. The collection should take into account the quantum of garbage generated in the total municipal area and the area planned for each collection vehicle. The estimation of garbage generated will have to be made in order to kick start the process of segregation and storage. At the macro-level, the approximate quantum of garbage generated in ULBs in the State can be estimated as follows.

Door-to-door collection shall be carried through the Municipal Staff / Authorised agency using push carts/tricycles or other similar devices preferably having two separate compartments for biodegradable and recyclable waste respectively. Each local body may device its own mechanism for arranging for these collection devices. Each sanitary worker should be allotted a fixed area in terms of producing units (households etc) for collection of the segregated waste. The collection should be done on **regular pre-informed timings** and integrating it in a mechanism to communicate the arrival of the collection person and device in the designated area. eg. the communication of arrival can be given through blowing of a whistle, blowing of horn, blowing musical bell etc., and this collection vehicle should move slowly in the designated area so as to enable the residents to deliver the waste to the person and the vehicle designated for collection. Night sweeping in markets, bus stands shall be encouraged to avoid disruption of regular activities. The normative requirement of manpower is as follows.

8.2.4 NORMATIVE STANDARDS

For street sweeping and collection of Municipal Solid Waste (4 hours)

1. Average road width .. 80 ft. ... One worker / 350 mtrs length
2. Average road width .. 60 ft. ... One worker / 500 mtrs length
3. Average road width .. ≤ 40 ft. ... One worker / 750 mtrs length

Street sweeping which includes roadside drain cleaning and waste to be collected by primary / secondary transport vehicle and to be sent to storage facility/processing plant/landfill - dump site.

8.2.4.1 Primary Collection of Waste

For Slums and BPL settlements:

- One 40 litre – HDPE bin to be placed for every unit of 100 people of the area.(approximately 20 households)
- Approximate weight of waste per bin would be 15 Kgs
- One push cart/tricycle to be provided for transfer of waste from the bins
- Then the waste from the push carts/tricycles or from 40 litre collection bins to be transferred to nearest secondary container.

Normative Standards for operation

a) **Push Cart**
   - One push cart (Capacity - 40 to 50 Kgs) can hold waste from 3 or 4 bins
   - Approximate time taken for one such operation for delivering to secondary container - 30 minutes

Depending on operational distance and travel time, quantity of waste and number of houses handled would vary.

b) **Tricycle**
   - One tricycle (Capacity - 80-100 Kgs) can hold waste from 4-6 bins
   - Approximate time taken for one such operation for delivering to secondary container – 45 minutes
   - Recyclables to be delivered to a separate transport system using existing vehicles like tippers and tractor trailers at pre determined time schedules.

From Non Slum residents

a) **Auto Tipper/Smaller Tipper:**
- The auto tipper would stop at every 50 m
- The segregated green waste is to be delivered by the residents to the vehicle either on move or stationary, at 50m distance intervals
- Atleast 10 houses can be handled at each stop.
- Time taken at every stop including transverse is 3 minutes
- Time take by auto tipper for collection from 500 houses before 1st transfer of waste to secondary container =2½ to 3 hours
- Time duration for collection from 1000 houses = 6 hours.(6.30 AM to 1.30PM) with one hour break in between.
- The waste collected from auto tippers would be transferred directly to 2.5cum/4.5cum secondary container

b) Push Cart

- One push cart can cover about 160 houses in a shift
- Push Cart can collect waste from 40 houses in a trip
- After each trip, the waste is delivered to the secondary container
- Time required for one trip will be 90 minutes
- One person is required for the operation of waste collection

c) Tricycle

- One tricycles can cover 240 houses in a shift (6 Hour)
- Tricycle can collect waste from 80 houses in one trip
- After each trip, the waste is delivered to the secondary container
- Time required for one trip will be 2 hours
- In a 6 hour shift 240 houses can be covered
- One person is required for the operation of waste collection

8.2.4.2 Collection from Commercial Establishments

- Waste to be collected during afternoon soon after green waste collection from houses
- Time duration for collection ... 1-2 hours approximately

8.2.4.3 Collection from Bulk waste generators

- Waste generators to make their own provisions as per specified storage container for storage of waste and to synchronise its collection and transport system
- Waste generators may also arrange for storage and transport of waste under contract management
- Separate fee can be collected for handling the above waste

8.2.4.4 Recyclable Waste Collection from houses

- Periodical collection on scheduled days and at a specific time-once/twice in a week
- Waste so collected would be delivered to a specified collector of recyclable waste
- In the absence of an established collection system by the recycling operators, the ULB has to store the waste at the processing/disposal site and make arrangements for recycling agencies to collect the waste.

The person designated for collection of the waste also has to undertake sweeping of streets and public places within the area allotted to him / her. The preferable timings for door-to-door collection of segregated solid waste from households and the street sweeping within the allotted area can be in the two shifts scattered in morning hours as decided by the Urban Local Bodies. However, the local bodies depending on the local practices, convenience of the public, availability of manpower and other conditions can devise their own timings.

The shops and other establishments normally open after 9:00 a.m. and therefore the synchronization of the timings for street sweeping and door-to-door collection of garbage may be done by the local bodies. Alternatively, the same can coincide with the closure of the shops in the evening and street sweeping can be completed in the night without any inconvenience to the public. The following alternatives may be considered for adoption by the local bodies:-

(a) Sweepers may first finish the work of street sweeping in the morning, and then start collection of segregated solid waste from the households, shops etc., as by that time the shops and establishments would be opened.

(b) An entirely different mechanism in the nature of outsourcing may be considered for the shops and establishments etc., on full cost recovery basis.

(c) Rag pickers may be organised or Self-Help Groups may be entrusted with the work of collecting recyclable waste from shops and establishments etc., leaving the collection of household waste to the regular municipal staff.

Depending upon the resources available in terms of manpower etc., a proper mix of different strategies is to be finalized by Urban Local Bodies for door-to-door collection of solid waste.

8.2.4.5 Collection of solid waste from community bins

The community bins provided by the Housing Societies, Resident Welfare Associations, Multi-storied complexes will store the two categories of solid waste generated by its occupants in different bins. The collection of segregated solid waste from these community bins should be done by municipal staff. The collection may either be done by municipal staff or outsourced to Self-Help Groups or other similar agencies or a mix of these two ensuring that collection is done on daily basis. The local bodies concerned may finalize the strategy in terms of method to be used.

Bulk generators like Hotels, Restaurants, Kalyana Mandapams, Markets etc shall be insisted for procuring and placing secondary container of required capacity as per standard design in their premises to handle their waste.

The secondary containers shall be placed on a pre cast cement concrete floor and the ULB would procure required number of secondary containers and manage the system.

Door-to-door collection of solid waste from purely residential localities like slums (whether notified or non-notified), residential area housing societies etc., shall be done following the guidelines mentioned under 8.2 above. The desirability of involving resident welfare associations and self-help groups entering into agreement with the local bodies for collection of segregated municipal solid waste and its transportation up to the intermediate storage facility (Transfer station) /treatment site (Compost Yard) or may be considered by each urban local body.

Rag pickers can be a source for improving MSW collection effectively and efficiently. There is a **need to organise rag pickers** and involve them in not only segregation of waste (which they traditionally do) but also engage them in door-to-door collection on same lines as Self-Help Groups. The training / orientation of rag pickers should, therefore, focus on hygienic segregation of waste using masks / gloves etc., which can be provided by the ULB. The organisation of rag pickers should preferably be done through an NGO under overall direction of ULB.

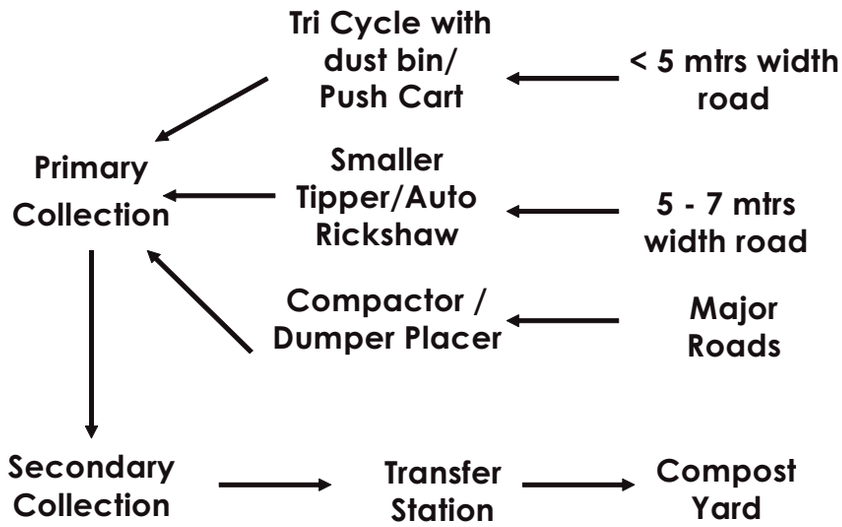
The following precautions have to be taken by the citizens, the Resident Welfare Associations, Self-Help Groups and the Municipal staff when collecting the segregated solid waste or transporting it to the nearest designated intermediate transit station etc.

(a) The solid waste should not be burnt.
(b) Stray animals should not be allowed to spread the garbage or to move near intermediate storage facility.
(c) The containers used for collection from door-to-door etc., should preferably be covered.
(d) The disposal of garbage by individual garbage producers should be permitted up to nearest community bin point only, and disposal of garbage on public places should be banned.
(e) The garbage collected by municipal staff or other agency should not be thrown into the surface drains.
(f) The refuse from street swept should not be thrown into the surface drains.

The garbage collection fee may be collected on need and affordability basis and therefore initially the domestic households and slums are not suggested for garbage collection fee. The garbage collection fee as fixed by the ULB should be collected from the bulk garbage producers while simultaneously ensuring 100% collection of garbage by the Municipal staff / Authorised agency. But council can take a decision to levy garbage collection fee from individual household through bye laws.

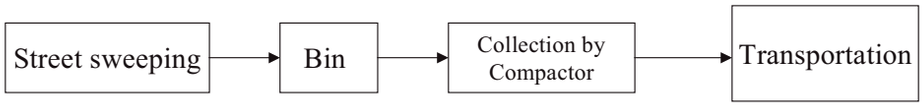
Different mechanisms can be worked out for type of collection device to be used wherever Resident Welfare Association or Self-Help Groups are entrusted the work of collection / segregation of solid waste and for this, the assistance under XII Finance Commission can be utilised in addition to providing collection devices to the collection agency directly depending on local resources etc.

Schematic Diagram for Collection and Disposal

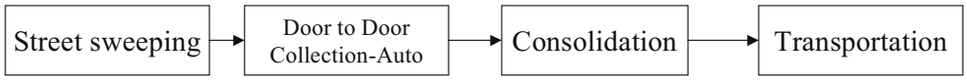


Methodology for Collection

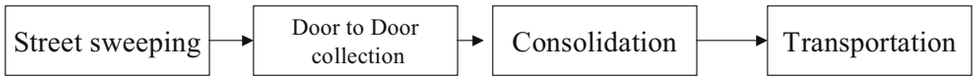
Broad Streets



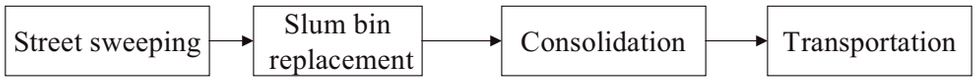
Narrow Streets



Lanes/By lanes



Slums



8.3 STREET SWEEPING

The municipal street sweeping functions are as follows:-

i) Sweeping of litter
ii) Cleaning of the channels along the roadside, and

iii) Pick up defecated material, like night soil, animal dung etc.,

In the long run, through citizen education effort should be made to deter the general public from littering on roads. Till such time the sweeping of all public roads, streets, lanes, bye-lanes etc., should be done daily wherever there is habitation or commercial activity. However, in exclusive public places devoid of habitation or commercial activity like parks and huge open spaces it can be done on a less frequent basis. The inventory of such places with their lengths and widths etc, should be prepared and the manpower should be calculated as per the normative standards suggested. While estimating the requirement of manpower for sweeping the streets and public places, collection of solid waste from the households, shops and establishments etc., should be taken into account by adopting normative standards. However, if all the above three activities are not taken together then different normative standards will have to be adopted and most of these are established norms.

The cleaning of open public places on a less frequent basis whenever required / decided to be done so, must be included in the sweeping programme so as to ensure that these places do not become the dump yards, where either citizens or the Municipal staff unauthorisedly dump the garbage.

The generation of waste is a continuous process and therefore street sweeping has to be done on **a daily basis without any holiday.** The local bodies should formulate the plans on the above lines while simultaneously taking up orientation training for the Municipal staff and Self-Help Groups etc. While formulating the programme on street sweeping and collection of segregated Municipal Solid Waste etc., the deployment plan of the staff / Self-Help Groups should be done in such a way that there is optimum utilization of staff and active involvement of Resident Welfare Associations / Self-Help Groups etc.

Designed instruments for street sweeping in order to ensure maximum efficiency:

a) Brooms with long handle
b) Baskets
c) Scrapers
d) Brush
e) Pans/Small containers / Tricycle with containers / Wheeled barrows/Push carts

Mechanised sweeping system can be used **only on paved roads** and its operation is dustless. Most mechanical sweepers are suction machines, usually assisted by one or more revolving "scarifying" brushes for dislodging adhering matter. They range in size from small pedestrian-controlled pavement sweepers to large channel sweepers, which often have an auxiliary engine to provide suction. Pavement sweepers are not usually practicable for cleaning normal footways because of obstructions

such as lamp-columns, and the presence of pedestrians. Their main application is for very large paved areas such as central reservations and car parks. When they can be deployed effectively, they are very efficient for the removal of fine dust.

The refuse collected through street sweeping should be deposited into the secondary transport system and this should not be mixed either with biodegradable or recyclable waste since most of it will be inert material meant for deposition into the land fill. The different permutations and combinations of operationalising the street sweeping, except drain cleaning, collection of segregated Municipal Solid Waste etc., can be examined and finalized from out of the options available in the nature of-

(a) Total work to be done by Municipal staff
(b) To be done on contract basis by service providers including self-help groups on a lumpsum contract basis.
(c) To be done on contract basis by service providers including self-help groups on a road / street length contract basis.

The street sweeping should be done in two shifts, wherein one shift should be in the early morning hours and second in the afternoon. Eg. Morning shift to start from 6 am to 11 am and afternoon shift from 2 pm to 5 pm etc. Instead of the morning shift, night shift can also be considered. The timings of the shifts may be finalized by the each town / city depending on the locally prevalent habits of the citizens, culture, the pattern of production of garbage, the availability of manpower, the working hours of the shops and establishments etc.

Normative Standard for staff requirement (4 hr work)

- Average road width of 80 ft .... One for every 350m length
- Average road width of 60 ft .... One for every 500m length
- Average road width of 40 ft and below .... One for every 750m length
- Street sweeping to include roadside drain cleaning
- Use the push carts for collection of waste and transport using the available tractor trailer or tipper auto
- The waste should be transported directly to landfill site

8.4 SECONDARY STORAGE- WASTE STORAGE DEPOT

This is an essential step for an appropriate Solid Waste Management system. All the waste collected through Primary Collection System, from the households, shops and establishments has to be taken to the processing or disposal site either directly necessitating a large fleet of vehicles and manpower or through cost effective systems which are designed to ensure that all the waste collected from the sources of waste generation is temporarily stored at a common place called “Waste Storage Depots” and then transported in bulk to the processing or disposal sites.

Collection centres exclusively for receipt of recyclable waste shall be opened and the recyclable waste may be received from the household on payment.

8.5 TRANSFER STATION

It is the centralised facility where waste is unloaded from smaller collection vehicle and reloaded into a large vehicle for transporting to a disposal or processing site. This transfer of waste is frequently accompanied by removal, separation or handling of wastes. In large cities where disposal sites are more than 10 km. away from the town boundary and smaller vehicles are used for transportation of waste, it may prove economical to set up transfer stations to save transportation time and fuel provided such cities have a good performance record of vehicle maintenance and adequate facilities to maintain large size vehicles and containers. Large size 15 to 20 cu. m. containers could be kept at transfer stations to receive waste from small vehicles. A ramp facility may be provided to facilitate unloading of vehicles or dumper placer containers, directly into large containers at transfer stations.The transfer stations may be constructed as a Material Recovery Facilities.

8.6 TRANSPORTATION OF SOLID WASTE

The Local Body should, depending upon the system of primary collection (collection from the source of garbage) adopted in the town, identify the locations where the solid waste intermediate storage facilities should be created. This is required in order to

(1) Optimise the use of transport devices.
(2) Optimise the use of manpower
(3) Timely collection from source and onward processing / disposal of solid waste.

Transportation of the waste stored at waste storage depots at regular intervals is essential to ensure that garbage bins/containers are not overflowing and waste is not seen littered on streets. Hygienic conditions can be maintained in cities/towns only if regular clearance of waste from temporary waste storage depots (bins) is ensured.

The functional element of transfer and transport involves two steps:

(i) the transfer of wastes from the smaller collection vehicle to the larger transport equipment and
(ii) the subsequent transport of the wastes, usually over long distances, to a processing or disposal site. The transfer usually takes place at a transfer station.

The following strategies can be considered by the Urban Local Bodies for primary transportation (from source of generation to the storage facility) of solid waste.

(a) Depending on the quantum of garbage generated and dispersion of the households, the solid waste storage facilities can be in the form of large metallic containers with lid (2.5 to 10 cubic meters)/HDPE containers at a distance not exceeding 200 to 250 meters from the area assigned to the sweeping staff / other agency involved in door-to-door collection work. The distance between two such containers should not exceed 400 meters. However, distance can

be determined on the basis of the load of garbage / refuse that is likely to be received at this storage facility from the catchment area concerned. These containers should be placed on cement concrete or asphalt flooring having a gradual slope towards the road in order to keep the site clean. If it is found inconvenient for whatever reason to provide such large containers for storage facility then small containers of 1.1 Cu.mtr.size may be placed on the roads, lanes etc., at short distance ensuring that the distance between two such small containers does not exceed 100 meters. The transport device to be used for primary transportation will vary from ULB to ULB depending upon the quantum of garbage generated. The containers kept at the storage facility should be cleared daily.

(b) Depending on the quantity of solid waste generated and nature of primary collection mechanism and the distance between the storage facilities and the final treatment / processing / landfill sites, a mix of different transport devices should be put into place.

(c) In the smaller cities, where the local body feels that it will be difficult to maintain hydraulic vehicles for transportation of waste for whatever reason (financial constraint, narrow roads and lanes etc), the urban local bodies can arrange for a low bed tractor trolley at the waste storage sites and the secondary transportation from the waste generation site to the disposal / land fill site can be done by this low bed tractor trolley.(Tractor mounted bins are also available)

(d) The primary transportation in areas where community bins are provided will have to be made more intensive because of the more quantity of solid waste in such community bins.

(e) The locations where waste storage facilities should be placed may be assessed in such a way that each container at the storage facility is cleared daily for the biodegradable waste. The recyclable waste should also be transported through the primary collection vehicle and brought to the storage facility, and should be kept separately till it is further disposed off by packing or other methods by the Agency finalized for this purpose, which should be either the local body itself or a Self-Help Group or other contracted agency and then finally disposed off. The inert material like silt from drains if not transported from source directly to the landfill site can be stored initially at intermediate storage facility in a separate container till it is transported to landfill sites.

Lifting of Garbage Bins to Treatment plant

Compactor

Dumper Placer

Dumper Placer in Operation

(4) The routing of secondary transportation vehicle, which will carry and unload the waste, preferably mechanically at treatment sites (Compost Yards) and landfill sites depending on the type of waste should be done in such a way that there is no zig-zag movement of the vehicle. The routing and number of trips etc., shall be worked out depending on the number of containers and the quantum of garbage and the frequency of clearance of the bins contemplated at the waste storage facility. The clearance of these containers needs to be planned atleast twice a day and therefore the routing vehicle and utilization of vehicles should be planned in two shifts. The timings etc. should be fixed in such a way that the container is nearly fill when it is planned for clearance by the transportation vehicle. This will minimize the whole process of transportation of solid waste and ensure not only full utilization of the existing transportation devices but also reduce the requirement and necessity of new transportation vehicles etc. Depending on the number of containers on the storage facilities, the container lifting device such as dumper placers / Refuse Collectors/Compactors may be considered for utilisation for transporting the large containers. From the bulk waste generators like hotels and restaurants, the tractor transportation either departmentally or through outsourced agency may be considered from the source to the storage facility or the processing site depending on the distance involved. A separate and exclusive storage facility in the form of container may be considered for the bulk producers of garbage and this can be finally transported up to the treatment site directly instead of intermediate storage facility (Transfer Station). The transportation of construction waste should be done exclusively by the waste producers and they should be told about the places where construction waste should be dumped i.e. landfill site or dumping place as the case may be. If there is an area, which is low lying and needs filling up, the producers of construction waste can be asked to dump the construction waste at such place for filling up the area. The urban local body should decide on these aspects. It should be ensured that no concrete bins are put as storage facility since concrete bins are not permitted under Municipal Solid Waste Rules, 2000.

In ULBs where the disposal site is far from city and smaller vehicles are used for transportation of waste, it is desirable to have **Transfer Stations** for optimal utilization of fleet. The transfer stations, however, should only provide for storing the inert material meant for landfill site and the biodegradable for a period of **not exceeding 3 days.** It will ensure optimum utilization of transport vehicles and also minimize the cost of transportation. Further, such transfer stations should be regularly treated in such a way that they do not become nuisance for adjacent residents and the precautions already mentioned (like preventing stray animals coming near such stations, not allowing manual handling done by the staff etc.,) should be resorted to. The transfer stations should have a proper security mechanism

in the form of a compound wall, watch and ward, and maintenance staff etc. It is preferable to have large containers of the size of more than 10 ton capacity at the transfer station/sub depot/collection point, which can receive the waste from smaller vehicles directly and **mechanically.** The transportation from transfer station to final disposal site during nighttime reduces the cost and the public inconvenience and it shall be encouraged. For operating and handling the vehicles, the ramp facility should be provided at the transfer stations. Each such ULB may work out the requirement of such large containers based on the total quantity of waste, capacity of containers at transfer station and the frequency of onward transport to the final disposal site. In case the transfer station is conceived for storing different categories of solid waste i.e., inert material, biodegradable waste etc, then separate container for each of these categories should be provided at the transfer stations.

The cleaning of surface drains should be taken up along with the street sweeping in accordance with the instructions already mentioned in the preceding paras by the same sweeping staff provided the surface drain is not more than 2' deep. In case of surface drain having more than 2' depth, the cleaning of such drains should be done by engineering staff and preferably by using purely mechanical devices or at least semi-mechanical device. However, it must be ensured that the silt removed from such drains is transported directly from the source to the storage facility / transfer station and it is not left unattended at the site of silt removal. The surface drains should be cleaned on a regular basis so as to ensure free flow of wastewater.

The ULB should take steps to organise awareness programmes for the citizens as well as the sanitation staff to ensure that the solid waste of whatever nature whether biodegradable or recyclable is not thrown into the drains. The staff engaged for cleaning of surface drains should be provided with all mechanical tools so that the staffs are not exposed to health and safety hazards. The work relating to the removal of silt from the underground drainage or manholes should be done purely in a mechanical mode, and disposed off in the manner described above. The tools for transporting the silt into the transport vehicles should also be provided to such staff engaged in cleaning of surface drains. It is reiterated that same staff should be assigned the task of removing silt from surface drains and transporting it into the transport vehicle. The preferred transport vehicle for this silt can be a tractor trolley in case of ULBs having a wide net-work of surface drains and covered cycle rickshaw with impermeable lining in the bottom and sides for ULBs with smaller surface drains net-work.

The transfer stations, the storage facilities as well as the secondary transport mechanism can be either fully handled by the ULB or by a service provider on turn-key basis depending on the resources and the constraints available in each municipality.

In addition, wherever these facilities are contemplated to be operated and maintained by Urban Local Bodies themselves, the option of fully owning and operating such facilities or only owning but outsourcing operating part on O&M, contract basis may be examined by each municipality itself(G.O Ms No:69, MA&WS Department dated:4.5.98 in **Annexure**(**VII**)

8.6.1 Normative Standards

- Secondary containers are to be transported either by Compactor/ Dumper placer/ Tractor/ Tipper as per recommendation based on the size and suitability of ULB
- Compactors are to be provided for cities having wider roads with a population more than 1 lakh and distance from the town to the disposal site is more than 10 km
- The green waste and predominantly biodegradable waste to be transported to treatment facility/disposal site as per arrangement
- The inorganic waste only has to be transported directly to landfill site
- One twin container Dumper placer would be required to make 5 trips in shift to treatment / disposal site with an average one way load of 10 km

- ULB to procure the vehicle and operate the system
- ULB to operate the system on contract basis with the operator providing the designated type of vehicle

9 PROCESSING OF MUNICIPAL SOLID WASTE

The recommended treatment practices to be adopted by urban local bodies in India are as follows:

1. Composting -Aerobic
   Vermi Composting
   Windrow Composting
2. Bio Methanation -Anaerobic
3. Refuse Derived Fuel (RDF) –Pelletisation
4. Waste to Energy methods- Power generation through Incineration

For segregated biodegradable waste

The composting is the preferred method for disposal / treatment for the biodegradable waste. However, there is another disposal method in the form of using it for energy production through different technologies available as on now. The pelletisation route has the advantage of safe disposal of garbage and a source of renewable energy. But the technical feasibility of undertaking such an activity depends on many factors including the quantity of biodegradable waste available and the additives which can be permitted to be used etc. The composting should confirm to the requirements set in form of standards under schedule IV of Municipal Solid Waste Rules,2000 framed by Government of India (***Annexure-I***). The different technologies available for composting of biodegradable waste can be studied by the Municipalities and they can decide the technology which suits their requirement. While selecting the technology for composting, it should be kept in mind that the final product is going to be used as manure and therefore **it should adhere to the requirement supporting its use in production of food items** because the manure is going to be used for production of food grains / vegetables etc.

9.1 COMPOSTING

"The environmentally and economically sustainable solution for Indian Municipal Solid Waste"

Composting of municipal wastes is a legal requirement provided under the Municipal Solid Waste Management (MSW) Rules, 2000 which requires that "biodegradable wastes shall be processed by composting, vermi composting, aerobic decomposition or any other appropriate biological processing for the stabilisation of wastes". The specified deadline for setting up of waste processing and disposal facilities was 31st December 2003 or earlier.

Composting is a natural biological process in which organic material is broken down by the action of microorganisms. Typical materials suitable for composting include, green waste and putriscible wastes with pre sorting and screening to remove non compostables, plus other enriched organic waste streams (sewage sludge, agricultural, food processing wastes).

The decomposition process takes place in the presence of air and results in elevated process temperatures, the production of carbon dioxide, water and stabilised residue, known as humus. A high degree of stabilisation can generally be achieved in 3-6 weeks, however 'curing' of the humus is normally carried out. For composting to occur in an optimum manner, five key factors need to be controlled; temperature, moisture, oxygen, material porosity and Carbon: Nitrogen ratio.

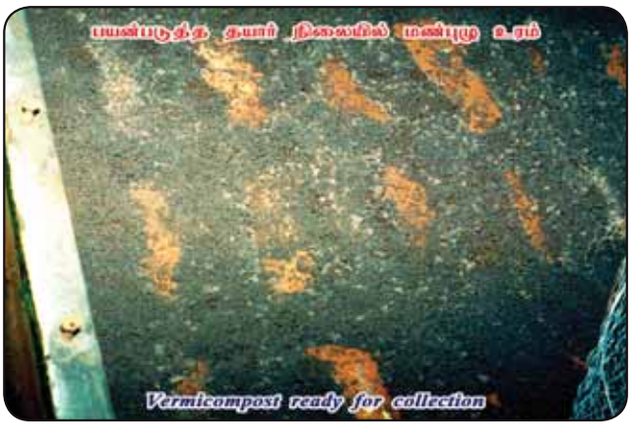
9.1.1 VERMI COMPOSTING

Vermi Composting is a bio oxidation and stabilisation process of organic matter that involves the joint action of earthworms and bio organisms and does not involve thermophilic agent. In this process the organic waste gets breakdown and fragmented by earthworms resulting in a stable non toxic material with good humus material that can be used as a soil conditioner. The earthworms are in fact, used in this process as the agents for turning fragmentation and aeration. In this process it is absolutely necessary to segregate the solid waste. The earthworms require moist conditions and hence large quantity of water is required in this process and no water logging is permitted.

This is the process by which decayed organic matter is eaten by a mix of bacteria, fungi and bacteria inside the bodies of earth worms, to convert waste to a digested soil like excretion and Vermi castings full of microbes useful to farmers. Earthworms are not pests like caterpillars and do not eat fresh food wastes. There are two stages in the process of Vermi composting. Initial decomposition of the waste and later its conversion by earthworms. Mixed waste cannot be used for Vermi composting as toxic substances can kill the earthworms. Only segregated wastes or domestic food waste can be composted through this process.

Vermi pits are generally made having a maximum depth of 2’6”, width of 5 to 6 feet and can have any suitable length.

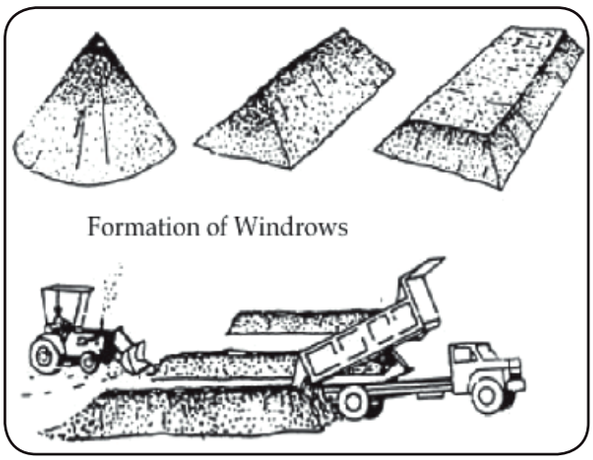
Various Stages in Vermi composting

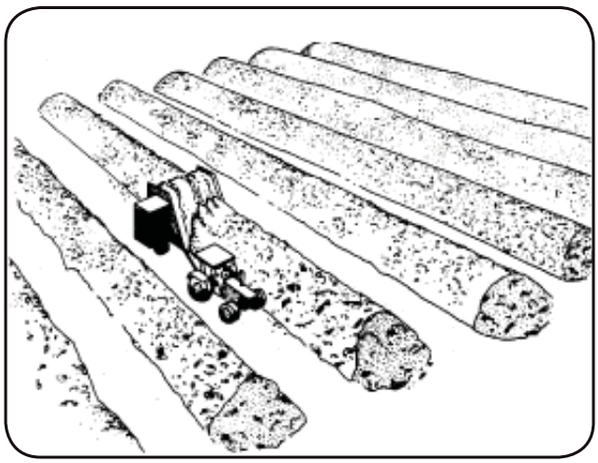


Various Stages in Vermi composting

9.1.2 Windrow composting

Windrow composting is an established technology for dealing with green wastes, where the material is piled in elongated rows and aerated through either turning of the windrows or through air forced through the material. This may take place in buildings or externally. In this process the waste is received and stacked in long windrows of 2to3m wide and 1to 1.50m high. The dimensions would vary depending on the volume of waste to be handled per day. The windrows can be treated with slurry substrate of bio enzymes /effective microorganisms for de odouring and for achieving accelerated bioconversion of organic matter in the waste. Due to exothermic reactions, the temperature of the windrow reaches about 55 ºto 65º within 36 hours and kills the pathogens. It also accelerates the fermentation. The moisture level of about 50% to 60% shall be maintained during the process. After every 5 day's interval, aeration is carried out by turning the windrows with the help of any suitable mechanical equipment like front loader/by manually. As the fermentation progresses, the organic biomass changes colour to dark humus like substances and its volume is reduced to about 50%.The fermentation is completed within five weeks. The well decomposed biomass is processed in separating, grading and sieving machines. In the process, foul smell is eliminated at the initial stage and the pathogens are killed by bio enzymes induced exothermic heat and the waste becomes free from flies, mosquitoes and insect vectors.





Windrow formation

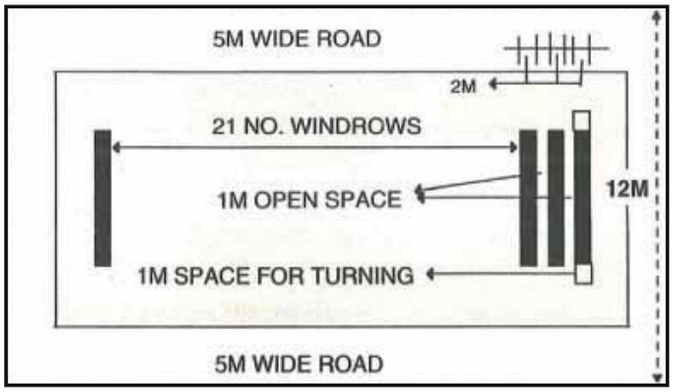
Turning of windrows

Windrows Moisturing
- Extra watering leads to leachate generation

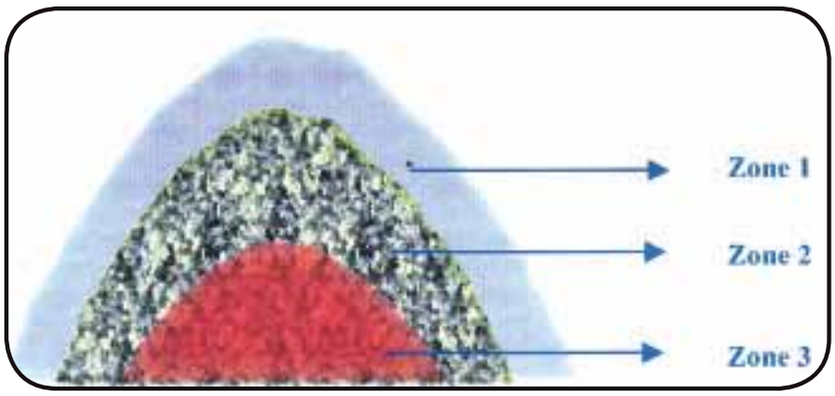
Processing stage

Springling of Cowdung solution
(Maintaining C:N ratio)

Seiving of Riped Manure



Typical Plan of a Windrow Yard



Typical cross section of windrow

Zone-1	Less Active Zone In this zone the biological activity is slow as it is exposed and influenced by climatic conditions
Zone 2	This is the most active zone where composting take place
Zone 3	No active zone - There is no activity takes place in this zone

9.1.3 Composting Process

Composting process requires sufficient oxygen for biological degradation of materials in the windrows. The windrows are turned at regular intervals with front-end loaders or special windrow turning machines. During the composting, the temperature rises due to exothermic reactions associated with respiratory metabolism. Elimination of all pathogenic micro organisms can be achieved by allowing the waste to reach a temperature of 70ºC for 1-2 hours. Under aerobic conditions the heat generated in composting is a by product of biologic burning or aerobic oxidation of organic matter to carbon dioxide. If the proper amounts of food (carbon),air, water are provided, aerobic organisms will dominate the compost pile and decompose the raw organic materials most efficiently. Optimal conditions of rapid, aerobic composting include Carbon:Nitrogen ratio of combined feedstocks between 25:1 to 30:1, moisture content between 45% to 60% by weight, available oxygen content concentration greater than 5%, particle size not greater than 30mm and pH between 6.5 to 8.5. The primary composting process can be completed in 15-20 days, after which a maturation process takes place.

The temperature increases as a result of oxidation of organic compounds, thermophilic bacteria (micro organisms that function at temperature between 45ºC and 70ºC (113ºF-157ºF) take over. Temperature in a compost pile typically follows a pattern of rapid increase to 45ºC - 60ºC within 24 hours of pile formation and is maintained. This is the active place of composting, in which easily degradable compounds and oxygen are consumed, pathogens and weed seeds are killed and phytotoxins are eliminated. During the thermophilic active composting phase oxygen must be replenished by forced aeration or turning of compost pile.

Aeration is necessary for high temperature aerobic composting to obtain rapid odor-free decomposition. Aeration is also useful in reducing high initial moisture content in composting materials. Several different aeration techniques can be used with varying degrees of success. Turning the material is the most common method of aeration when composting is done in stacks. Hand turning of the compost piles or in units is most commonly used for small garden operations. Mechanical turning is most economical in large municipal or commercial operations. The most important consideration in turning compost, apart from aeration, is to ensure that material on the outside of the pile of units is turned into the center where it will be subject to high temperatures. For piles or windrows on top of the ground, material from the outer layers can be placed on the inside of the new pile. Volume reduction during the stabilization period helps turning within the units.

Frequency of aeration or turning and amount of aeration or total number of turns are governed primarily by moisture content and type of material. Moisture is the most important component. High moisture content reduces the pore space available for air as well as reducing the structural strength of the material. This permits greater compaction and less interstitial or void space for air in the pile. Materials with a high C:N ratio or containing large amounts of ash and other inert material may not have to be aerated as often as material which decomposes more actively and rapidly. After the active phase, temperature gradually declines to around 38ºC(100ºF) mesophilic organisms recognize the pile and curing phase begins. The rate of oxygen consumption declines where compost can be stockpiled without turning, materials continue to decompose and are converted into biologically stable humic substance ‘manure’.

Aerobic Composting Process

Bio-Degradable Waste

↓

Reduction of sizes by using Pulverizer or Chopper

↓

Forming Windrows

↓

Turning the windrows initially for every 5 days and once in 10 days after 20 days by using Turner

↓

Maintaining temperature at 50ºC to 60ºC.

↓

Maintaining the Windrows with 50% to 60% Moisture.
(Moisturing with Leachate, culture etc., accelerates the Composting)

↓

Transferring the Riped Compost by Conveyor for sieving to the size of 5 mm by using Mechanical Siever

↓

Sieved Compost as Bio-manure

Process flow in windrow composting

9.2 BIO METHANATION

In this process, the organic fraction of wastes is segregated and fed into a closed container (biogas digester) where, under anaerobic conditions, the organic wastes undergo bio-degradation producing methane-rich biogas and effluent/ sludge. The biogas production ranges from 50-150m³/tonne of wastes, depending upon the composition of waste. The biogas can be utilised either for cooking/ heating applications, or through dual fuel or gas engines or gas / steam turbines for generating motive power or electricity. The sludge from anaerobic digestion, after stabilisation, can be used as a soil conditioner, or even sold as manure depending upon its composition, which is determined mainly by the composition of the input waste.

9.3 ALCOHOL FERMENTATION

This is a developing technology applicable to cellulosic biomass. It involves anaerobic decomposition of cellulosic organic matter by Ethanologic bacteria to produce mainly Ethanol. More than 95% of the Ethanol produced world-wide is through fermentation by yeast of molasses or starch (sugar or starch substances) which are in short supply and are required for alternative uses. Ethanol production utilising less expensive, abundant and renewable feed-stock such as cellulosic bio-mass (lignocellulosics) is, therefore, desirable. Yeasts, however, are currently unable to degrade cellulose. Acid/Alkali treatment of ligno-cellulosics removes lignin & other inhibitory materials and renders the biopolymers accessible to enzymatic degradation and Ethanol production. This is, however, an extra cost factor. Bacterial strains have been developed in recent years which yield high substrate conversion efficiencies and Ethanol tolerance. Some of these bacteria also have the ability to ferment both cellulose and hemi-cellulose leading to complete utilisation of cellulosic bio-mass. Such production of Ethanol has a great potential and is one of the best eco-friendly technologies for energy recovery from fibrous wastes. Ethanol can be used as a fuel, a fuel additive, or as a chemical feed stock.

9.4 PYROLYSIS

This method of treatment is not practiced in India. Pyrolysis involves an irreversible chemical change brought about by the action of heat in an atmosphere devoid of oxygen. Synonymous terms are thermal decomposition, destructive distillation and carbonisation. In partial combustion, oxygen is present in insufficient quantities to cause complete combustion. Normal combustion, as in conventional incineration requires the presence of sufficient amount of oxygen which will ensure complete oxidation of organic matter.

To ensure complete combustion and to remove the heat produced during the reaction, excess air is supplied during incineration which leads to air pollution problems. Thus even the simplest of hydrocarbons will yield a variety of products under conditions of partial combustion. As the complexity of fuel increases the variety of possible products also increases. Pyrolysis, unlike incineration is an endothermic reaction and heat must be applied to the waste to distill off volatile components.

When the waste is predominantly cellulose under slow heating at a moderate temperature, the destruction of bonds is selective (the weakest breaking first) and the products are primarily a non-combustible gas and a non-reactive char. On the other hand, when the waste is rapidly heated to a high temperature, complete destruction of the molecule is likely to take place. Under intermediate conditions, the system would yield more liquid of complex chemical composition. Normally these two processes are referred to as low temperature and high temperature pyrolysis respectively. Pyrolysis is carried out at a temperature between 500ºC and 10000ºC to produce three component streams.

i) Gas: It is a mixture of combustible gases such as hydrogen, carbon monoxide, methane, carbon dioxide and some hydrocarbons.
ii) Liquid: It contains tar, pitch, light oil and low boiling organic chemicals like acetic acid, acetone, methanol, etc.
iii) Char: It consists of elemental carbon along with the inert materials in the waste feed.

The char, liquids and gas have a large calorific value. This calorific value should be utilised by combustion. Part of the heat obtained by combustion of either char or gas is often used as process heat for the endothermic pyrolysis reaction. It has been observed that even after supplying the heat necessary for pyrolysis, certain amount of excess heat still remains which can be commercially exploited.

9.5 PLASMA ARC TECHNOLOGY/PLASMA PYROLYSIS VITRIFICATION

This is an emerging technology for energy/resources recovery from organic wastes. The system basically uses a Plasma Reactor houses one or more Plasma Arc Torches which generate, by application of high voltage between two electrodes, a high voltage discharge and consequently an extremely high temperature environment (between 5000-14,000ºC) approximating the temperature of the Sun. This hot plasma zone dissociates the molecules in any organic material into the individual elemental atoms while all the inorganic materials are simultaneously melted into a molten lava.

The waste material is directly loaded into vacum in a holding tank, preheated and fed to a furnace where the volatile matter is gasified and fed directly into the plasma arc generator where it is pre-heated electrically and then passed through the plasma arc dissociating it into elemental stages. The gas output after scrubbing comprise mainly of CO and H_2. The liquefied produce is mainly methanol.

The entire process is claimed to safely treat any type of hazardous or non hazardous materials. It has the advantage that the oxides of Nitrogen (NOx) and oxides of Sulphur (SOx) gaseous emissions do not occur in normal operation due to the lack of oxygen in the system.

9.6 REFUSE-DERIVED FUEL (RDF)-PELLETISATION

The process of conversion of garbage into fuel pellets involves primarily drying, separation of combustibles from garbage, size reduction and pelletisation after mixing with binder and/or additives as required.

The MSW collected for disposal is tested for its moisture content and when the moisture content is more than 35- 40%, it requires drying to produce fuel pellets with reasonable heating values. The reduction in moisture can be done artificially or by natural sun drying. Sun drying is preferred when adequate land is readily available. However, during periods of heavy rainfall, alternate arrangements for drying will have to be made. The moisture level of waste is brought down to around 35-40% by uniformly spreading it on an open, paved area and allowing it to be dried by the Sun. The duration of sun drying varies from 1 to 2 days depending upon the garbage quality. In the process of spreading the garbage, manual inspection is carried out to remove large debris, tree cuttings, tyres etc., which are harmful to the downstream process equipment.

Pelletisation

The noncombustible items are removed, separating glass and metals for recycling. The combustible waste is shredded into a smaller, more uniform particle size for burning. The RDF thus produced may be burnt in boilers on-site, or it may be shipped to off-site boilers for energy conversion. If the RDF is to be used off-site, it is usually densified into **pellets** through the process of pelletisation. **Pelletisation** involves segregation of the incoming waste into high and low calorific value materials and shredding them separately, to nearly uniform size. The different heaps of the shredded waste are then mixed together in suitable proportion and then solidified to produce **RDF pellets**. Additional advantage is that the pellets can be conveniently stored and transported.

Different forms of pellets

Waste to Energy

It is the process of direct burning of wastes in the presence of excess air (oxygen) at the temperature of about 8000°C and above, liberating heat energy, inert gases and ash. Net energy yield depends upon the density and composition of the waste; relative percentage of moisture and inert materials, which add to the heat loss; ignition temperature; size and shape of the constituents; design of the combustion system (fixed bed/ fluidised bed), etc. In practice, about 65 to 80 % of the energy content of the organic matter can be recovered as heat energy, which can be utilised either for direct thermal applications, or for producing power via steam turbine generators (with typical conversion efficiency of about 30%). The combustion temperatures of conventional incinerators fuelled only by wastes are about 760° C in the furnace, and in excess of 870°C in the secondary combustion chamber. These temperatures are needed to avoid odour from incomplete combustion but are insufficient to burn or even melt glass. To avoid the deficiencies of conventional incinerators, some modern incinerators utilise higher temperatures of up to 1650˚C using supplementary fuel. These reduce waste volume by 97% and convert metal and glass to ash. While incineration is extensively used as an important method of waste disposal, it is associated with some polluting discharges, which are of environmental concern, although in varying degrees of severity. These can fortunately be effectively controlled by installing suitable pollution control devices and by suitable furnace construction and control of the combustion process.

9.7 RECYCLABLE SOLID WASTE

The segregated recyclable solid waste can be disposed off by selling it to the institutions / agencies, which recycle it for different activities. From the municipality point of view, the segregated recyclable waste can be either disposed off at the stage of solid waste storage facility or it may be collected near the dumping site and disposed in bulk or a combination of different patterns. The local body may examine the route, which it wants to take for disposal of recyclable waste. The Material Recovery Facility (MRF) is meant for further segregation of recyclables into separate categories for effective reuse and recycling. The “RAG PICKERS” and members of Self Help Groups can be used for this purpose. The segregation here can be either done manually or through semi-automatic system depending on the quantum of waste generated and financial resources available with the ULBs.

The inorganic and non biodegradable like plastic, metal, rubber, glass, stones, sand, bricks can be recovered for different uses for recycling.

Recycling of solid waste

9.7.1 Inert material

The inert material, which includes dust, sand, the silt removed from the surface drains and underground drains, the refuse of the street sweepings, bricks, stones, etc., shall be disposed off by using them for filling the low lying areas, formation of roads, patches etc. The rejects from the compost plant and other non recyclable alone can be disposed off in a sanitary landfill.

Debris used for repairing the potholes

Bricks manufactured through inert material

The ULBs can take action simultaneously for the development of sanitary land fill wherever the site is acquired or identified land for acquiring for sanitary landfill, wherever the site identified for this purpose has not been done so far, the disposal of inert material can be done at the municipal dumping sites. However, the normal safety precautions and health compliance criteria should be followed on these existing municipal dumping sites in the form of preventing entry of stray animals, preventing rag pickers from manually handling the inert material, preventing manual handling of inert material by the municipal staff etc. The different stages of activities related to construction of sanitary landfill should have compliance with the specifications laid down under Schedule II of Municipal Solid Waste Rules 2000 in this regard (***Annexure-I***). Wherever the sanitary landfill construction is taken up, the necessary authorization as required under Rule 4(2) and 6(2)of Municipal Solid Waste Rules 2000 issued by Government of India should be obtained from the concerned competent authority (***Application in 'Format I'& issuance by TNPCB in Format III of Annexure-I***). The sanitary land filling should be restricted to only non-biodegradable inert waste. It cannot be used for recyclable or biological waste storage. The mixed waste should not be allowed to be put into sanitary landfill. The leachate treatment in sanitary landfill should confirm to the requirements of State Pollution Control Board and the practices and standards prescribed under MSW Rules 2000 (***Annexure-I***). Wherever the landfills are taken up, a system of environmental monitoring on a regular basis should be developed and enforced in accordance with MSW Rules 2000. The present municipal dumpsites can be used tentatively as landfill sites till the construction of sanitary landfill is completed. The guidelines regarding whether individual sanitary landfill for a municipality / corporation, or a sanitary landfill for a cluster of municipalities, or a sanitary landfill for cluster of municipalities is required will be issued separately.

10 FINAL DISPOSAL OF SOLID WASTE

At present, different disposal practices are being followed in the local bodies, which include composting, recycling of recyclable material and dumping in municipal dump sites. It results in a situation where there is no economic utilisation of garbage as an asset and there is simultaneously unnecessary occupation of dumpsites leading to health hazards and inconvenience to citizens.

10.1 SCIENTIFIC SANITARY LANDFILL

The final functional element in the solid waste management system is disposal. Today the disposal of wastes by landfilling or uncontrolled dumping is the ultimate fate of all solid wastes, whether they are residential wastes collected and transported directly to a landfill site, residual materials from Materials Recovery Facilities (MRFs), residue from the combustion of solid waste, rejects of composting, or other substances from various solid waste-processing facilities.

The Non-biodegradable waste transported from the transfer stations, rejects from the processing plant and the inert materials such as street sweepings and rejects from the compost plant shall be collected separately and thereafter disposed in a Scientific Sanitary landfill.

10.2 LANDFILL

Dumping of solid waste in a scientifically designed land is called Sanitary Landfill. The landfilling of municipal solid waste on land by just dumping without any containment will cause the following problems:

(a) Groundwater contamination through leachate
(b) Surface water contamination through runoff
(c) Air contamination due to generation of gases, litter, dust, bad odour

(d) Other problems due to rodents, pests, fire, bird menace, slope failure, erosion etc.

Landfills minimise the harmful impact of solid waste on the environment by

(a) isolation of waste through containment;
(b) elimination of polluting pathways;
(c) controlled collection and treatment of products of physical, chemical and biological changes within a waste dump – both liquids and gases; and
(d) environmental monitoring till the waste becomes stable.

10.2.1 Types of Landfilling

Three types of landfilling have been practiced.

1.Trench Method

This method involves excavation of trench into which waste is disposed and covered with a layer of soil.

2.Area Method

In this method waste may be deposited in layers and so form terraces over the available area. In this type of operation excessive leachate generation may occur and is difficult to control.

3.Cell Method

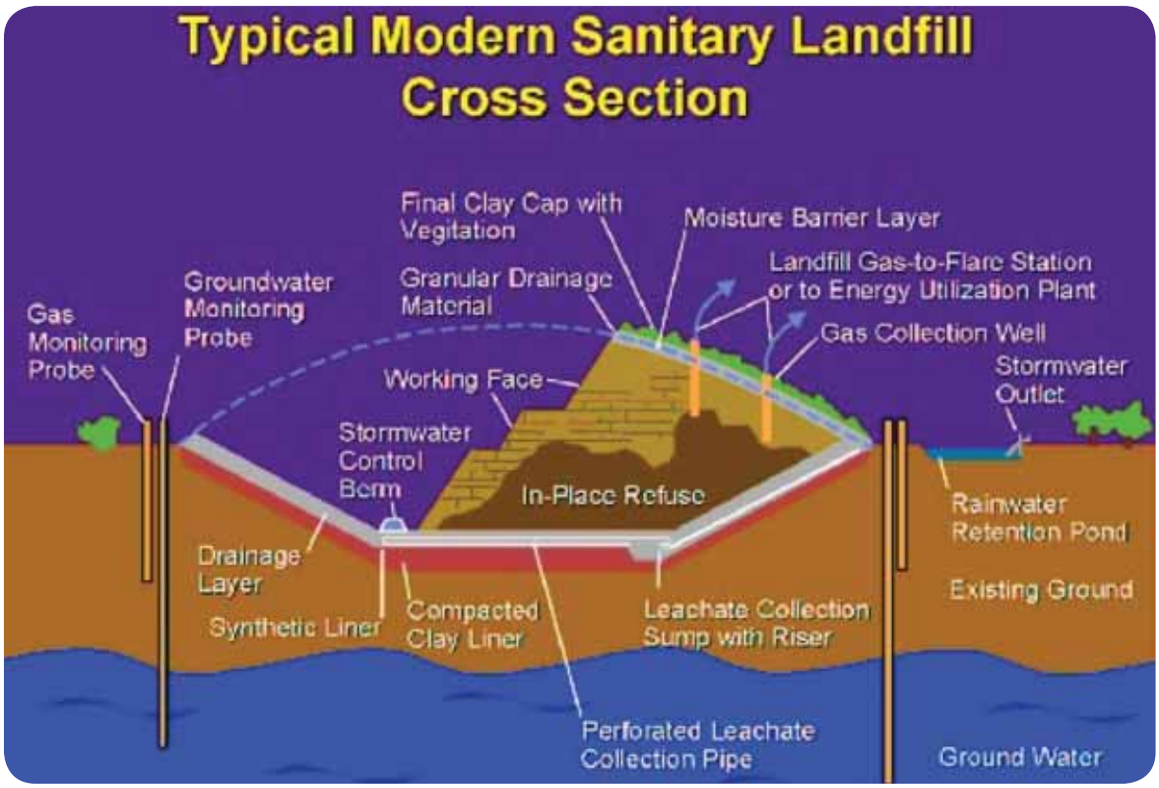
This method involves the depositing of waste in pre constructed bonded area. It is the preferred method in industries,since it encourages the concept of progressive filling and restoration. Operating a cellular method of filling enables wastes to be deposited in a tidy manner since all the cell serve to both conceal the tipping and rap much of the litter, which may be generated.

In all the above at the end of each working day all the exposed surfaces including the flanks and working space should be covered with a suitable inert material to a depth of 15cm. The daily covering is essential, as it minimises the windblown litter and also reduces the odours.

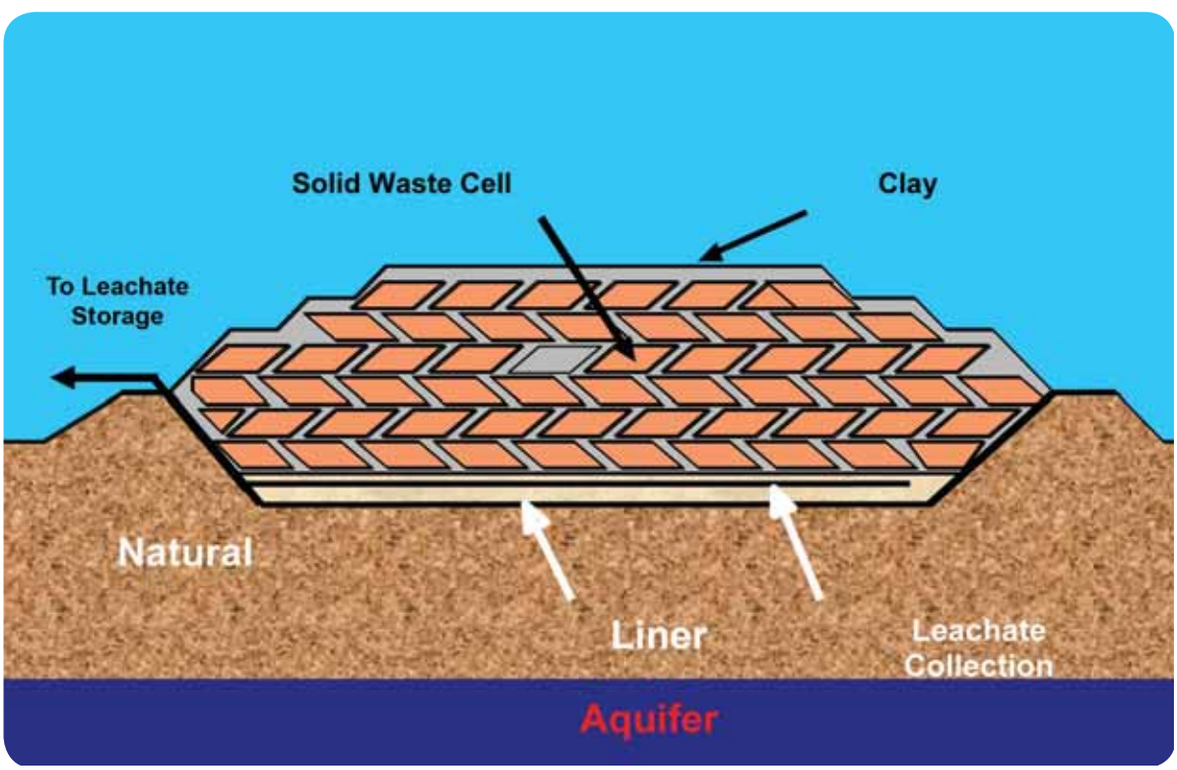
Landfill design philosophy in the early 1990's tended towards total containment or isolation of waste. It is now recognised that this is unattainable and that it is more appropriate to design for controlled release rather than attempt indefinite isolation because all containment systems will eventually allow passage of water beyond the design period. The basic philosophy of all modern landfills revolves around the concept that waste which will not become stable or inert with time will be treated as 'stored' and not 'disposed'.

Sanitary Landfilling involves proper planning and application of engineering principles and construction techniques. Three C's of sanitary landfilling are '**Confine, Compact** and **Cover**'. The solid waste are spread in thin layers compacting them to the smallest practical volume and covering them with soil at the end of each working day in a manner that protects the environment.Sanitary landfill not only prevents burning of garbage but also helps in reclamation of land for valuable use.

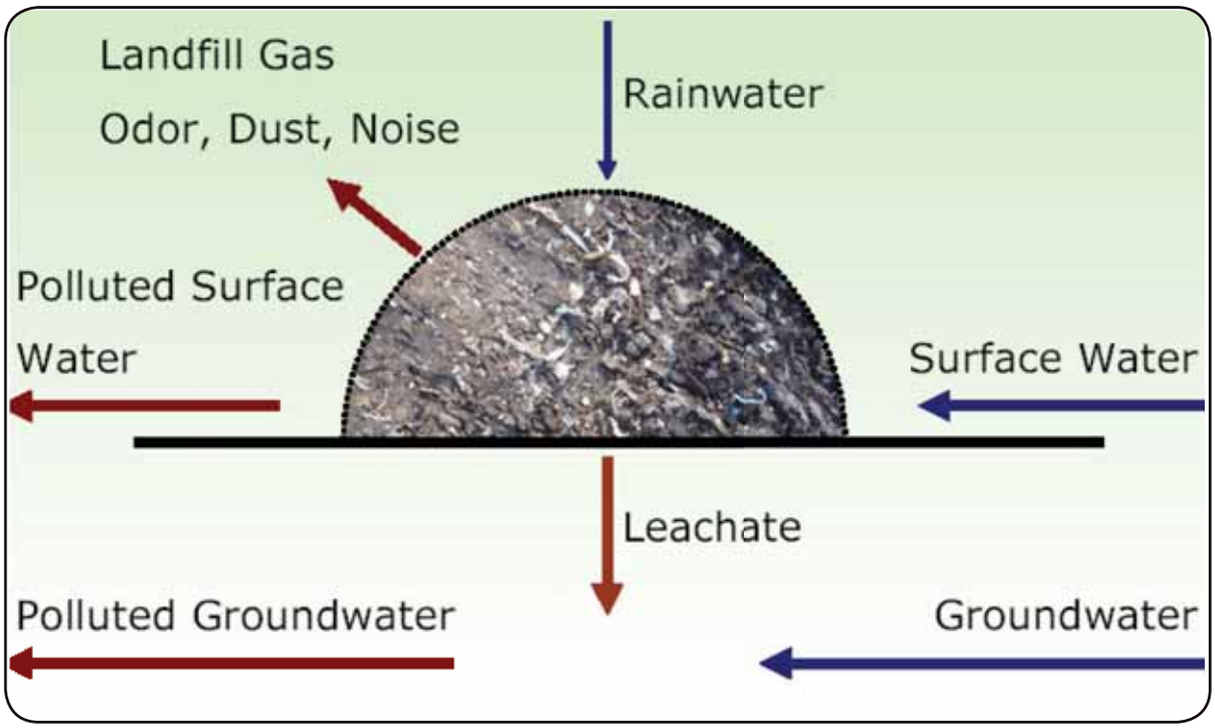
The rejects from the composting process have to be landfilled. The Sanitary Landfill approach is based on the MSW Rules. The landfill is based on concepts of isolation of the landfill from surface water and containment of wastes within the landfill. The landfill would be developed for isolation of the wastes from surface runoff and containment of the waste to protect against the movement of leachate directly into the ground. Liner systems with leachate collection would be provided. A leachate treatment facility would also be provided. Once the planned waste levels are reached, a cover liner would be provided. The landfill would be developed with 20-25 year's perspective.



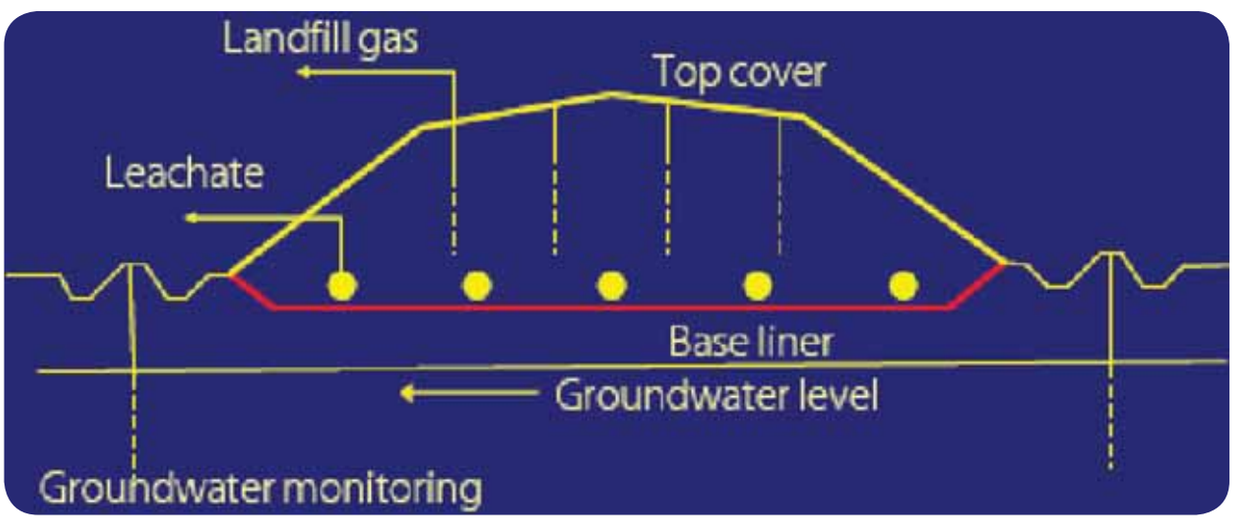
Typical Lined Landfill cross section



Typical Lined Landfill with cell arrangements



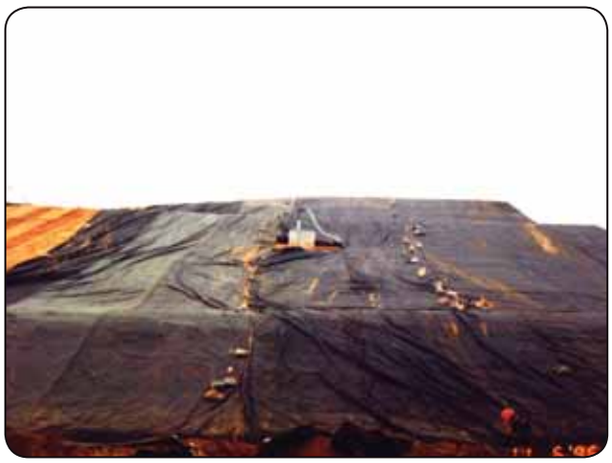
Impacts of Dumpfill



Typical Modern Sanitary Landfill

Landfill under Construction

Geotex lining in landfill



Closure of landfill

Gas collection

The guidelines for sanitary landfill site is described in Municipal Solid Waste (Management & Handling) Rules,2000 (**As per schedule III of annexure I**). In addition the Manual on Solid Waste Management by CPHEEO has also stipulated some criteria for selection of site for scientific sanitary landfill.

10.3 STANDARDS AS PER CPHEEO MANUAL

Central Public Health Environmental Engineering Organisation(CPHEEO) has stipulated certain criteria for sanitary landfill in its Manual on Municipal Solid waste Management as follows;

The seven essential components of a MSW landfill are:

(a) A liner system at the base and sides of the landfill which prevents migration of leachate or gas to the surrounding soil.
(b) A leachate collection and control facility which collects and extracts leachate from within and from the base of the landfill and then treats the leachate.
(c) A gas collection and control facility (optional for small landfills) which collects and extracts gas from within and from the top of the landfill and then treats it or uses it for energy recovery.
(d) A final cover system at the top of the landfill which enhances surface drainage, prevents infiltrating water and supports surface vegetation.
(e) A surface water drainage system which collects and removes all surface runoff from the landfill site.
(f) An environmental monitoring system which periodically collects and analyses air, surface water, soil-gas and ground water samples around the landfill site.
(g) A closure and post-closure plan which lists the steps that must be taken to close and secure a landfill site once the filling operation has been completed and the activities for long-term monitoring, operation and maintenance of the completed landfill.

Site Selection

Selection of a landfill site usually comprises of the following steps, when a large number of landfill sites are available:

(i) setting up of a locational criteria;
(ii) identification of search area;
(iii) drawing up a list of potential sites;
(iv) data collection;
(v) selection of few best-ranked sites;
(vi) environmental impact assessment and
(vii)final site selection and land acquisition.

However, in municipalities where availability of land is limited, the selection process may be confined to only one or two sites and may involve the following steps:

(i) Setting up of locational criteria;
(ii) Data collection;
(iii) Environmental impact assessment and
(iv) Final site selection.

Locational Criteria

A locational criteria may be specified by a regulatory agency (e.g. Pollution Control Board). In the absence of regulatory requirements, the following criteria are suggested. If it is absolutely essential to

have a landfill site within a restricted zone(s) then appropriate design measures are to be adopted and permission from the regulatory agency should be sought:

Criteria for sanitary landfill

- No landfill should be developed within 200 m of any lake or pond. Because of concerns regarding runoff of waste contact water, a surface water monitoring program should be established if a landfill site is less than 200 m from a lake or pond.
- No landfill should be developed within 100 m of a navigable river or stream. The distance may be reduced in some instances for non-meandering rivers but a minimum of 30 m should be maintained in all cases.
- No landfill should be developed within a 100 year flood plain. A landfill may be built within the flood plains of secondary streams if an embankment is built along the streamside to avoid flooding of the area. However, landfill must not be built within the flood plains of major rivers unless properly designed protection embankments are constructed around the landfills.
- No landfill should be developed within 200 m of the right of way of any national or state highway. This restriction is mainly for aesthetic reasons. A landfill may be built within the restricted distance, but no closer than 50 m, if trees and berms are used to screen the landfill site.
- A landfill should be atleast 500 m from a notified habitated area. A zone of 500 m around the landfill boundary should be declared a no-development buffer zone after landfill location is finalised.
- No landfill should be developed within 300 m of a public park. A landfill may be developed within the restricted distance if some kind of screening is used with a high fence around the landfill and a secured gate.
- No landfill should be within critical habit area. A critical habit area is defined as the area in which one or more endangered species live. It is some times difficult to define a critical habitat area. If there is any doubt then the regulatory agency should be contacted.
- No landfill should be developed in wetlands.
- No landfill should be developed within 20 km of any airport or the limits prescribed by regulatory agencies (MoEF/CPCB/Aviation Authorities) from time to time.
- No landfill should be developed within 500 m of any water supply well. It is strongly suggested that this locational restriction be abided by at least for down gradient wells. Permission from the regulatory agency may be needed if a landfill is to be sited within the restricted area.
- A landfill should not be situated in a Coastal Regulation Zone (CRZ).
- A landfill should not be located in potentially unstable zones such as landslide prone areas, fault zone etc.
- A landfill should have a buffer zone around it, up to a distance prescribed by regulatory agencies.

Search Area

To identify the potential sites for a landfill a ‘search area’ has to be delineated. The search area is usually governed by the economics of waste transportation. It is usually limited by the boundaries of the municipality. Typically search areas are delineated on a map using a ‘search radius’ of 5 to 10 km, keeping the waste generating unit as the centre. Alternatively, the search area may be identified by

adopting a range of 5 km all around the built-up city boundary. One should start with a small search area and enlarge it, if needed.

Development of a List of Potential Sites

After demarcating the search area, as well as after studying the various restrictions listed in the locational critieria, areas having potential for site development should be identified. A road map may be used to show the potential sites that satisfy the locational criteria. Preliminary data collection should be undertaken with an aim of narrowing the list of sites to a few best-ranked sites. In areas where land availability is scarce, degraded sites such as abandoned quarry sites or old waste dump sites can be considered. Special design measures are required for such sites.

10.4 LANDFILL OPERATION

Site Preparation:

Preparation of Landfill Base

- Site Clearance (Retain the Vegetation around the site for Buffer)
- Prepare Base for First Cell only (Precede subsequently)
- Earth shall be stored for daily & intermediate covers
- Compact the base
- Provide 2% slope towards leachate collection sump

Laying of Bottom Liner

- Source of clay shall be as near to site as possible
- If clay is not available amend the local soil with bentonite
- Maintain uniformity in grain size
- Carryout onsite permeability test
- Compacted soil liners should be constructed in a series of lifts each of 25cm compacted to about 15cm by compactor / sheep foot roller
- The finished thickness of liner should not be less than 90 cm
- Care has to be taken not to expose the clay liner surface during summer as cracks may develop

Laying of Geomembrane Layer

- Prepare Surface before laying of liner (particles >10mm should not be present)
- Base should also be checked for any depressions and cracks
- The size of geomembrane sheet should be easy to handle and work with, if larger sized are used, handling and laying will be difficult and smaller size require more numbers.
- The geomembrane is usually spread for the active phase and anchor trenches are provided at free ends to safeguard membrane displacement, slipping and to facilitate further laying of adjacent phases
- A protective layer of fine grained soil screened of in situ soil of particle size less than 10mm, of thickness 15cm has to be provided over the top of geomembrane
- The protective layer should be laid without vehicles travelling directly on the geomembrane

Laying of Drainage Layer and Leachate Collection System

- A comprehensive leachate collection system laying schedule has to be prepared before the commencement of each phase of operation

- The Leachate collection pipe net work should be laid on the flat base as per the network layout
- The Leachate collection pipes should be embedded in drainage layer consisting of gravel of particle size 16 to 32mm and permeability to the tune of $1x10^{-2}$cm/sec and should be of 30 cm thickness

Operation Procedures:

Formation of Working Areas

- Working areas are constructed with in a larger area and a number of daily cells will be placed at bottom level over which cells are formed one above the other to cover the total lift of one phase

Waste Unloading, Spreading and Compaction

- Unloading of waste from delivery vehicles is a potentially hazardous operation
- All drivers shall be fully aware of the site rules governing the unloading of waste and obey instructions issued by site operatives
- A minimum of two discharge points should be maintained at all times
- Control should be exercised over the number of vehicles permitted inside the discharge area at any one time
- Comprehensive sign – posting should direct all drivers to the specific discharge point
- The designed tipping slopes should be maintained during tipping operation
- The waste is then pushed to the cell area, spread in layers not exceeding 50cm and should be compacted by the compactor
- The subsequent loads are pushed above the initial layer to form the design cell height of 3m and to attain the design slopes

Waste Unloading, Spreading and Compaction

- Considerable care should be exercised when placing the initial lift of waste above the land-fill lining and leachate collection layer
- Individual items of wastes may be deemed to be unsuitable if these are large or bulky and likely to penetrate or deform the basal engineering measures
- All such unsuitable wastes should be stockpiled and, as soon as the initial lift becomes sufficient , should be incorporated into an early second lift

Daily Cover

- At the end of each working day the cell should be finally compacted to provide a smooth surface and covered by cover material
- The cover material shall be spread evenly to a thickness of 15 cm to cover the entire exposed face including flanks and working face

Intermediate Cover

- Daily cover fulfills only transient function and an intermediate cover should be provided at the end of each lift.
- Apart from this usual intermediate, a cover is proposed prior to onset of monsoon over the active area. An intermediate cover of 45 cm thickness is proposed using low permeable soil, which will be compacted with compactor providing 3 to 5 per cent gradient for surface water runoff

11 RAJKOT MODEL - AN ALTERNATIVE STRATEGY

Segregation of waste at source is the first and foremost step to be practiced for achieving a better solid waste management programme. Segregation is the separation of Municipal Solid Waste into the specified groups of bio-degradable, non degradable, hazardous, bio-medical, construction and demolition, bulk garden and horticultural, and all other inert wastes which need to be carried out at the source of generation ie household.

Schedule II of MSW Rules,2000 states that,

> 'In order to encourage the citizens, municipal authority shall organise awareness programmes for segregation of wastes and shall promote recycling or reuse of segregated materials.
>
> The municipal authority shall undertake phased programme to ensure community participation in waste segregation. For this purpose, regular meetings at quarterly intervals shall be arranged by the municipal authorities with representatives of local resident welfare associations and non-governmental organizations'.

However, an alternative model has been developed at Rajkot Municipal Corporation in the State of Gujarat which follows Public Private Partnership (PPP)mode as discussed below.

Rajkot is one of the City Municipal Corporations in the State of Gujarat. The city has geographical area of 104.86 sq.kms and has a population of 1002000. The total waste generated in the city is approximately 500 Metric Tonnes per day. Rajkot Municipal Corporation does not have any facility for processing the solid waste. It has two landfill sites viz. 'Sokhada' having an area of 11 acres of land, 12 kms away from the city and 'Manda dungar' land with 2.5 acres, 7 kms away from the city. Both the land fill sites are about to take fill fully and RMC has already put forward a proposal for new landfill site with Government of Gujarat for 40 acres of another landfill site near 'Nakrawadi', 15 kms away from the city.

The major sources of solid waste generation are household domestic waste, industrial waste, commercial establishments, plastic, rubber, metals etc.

Primary and secondary collection

The Corporation has many primary collection points for collecting waste from various generation points. The waste is collected through tri-cycles, wherein the people will deliver the waste to these rickshaw pullers, who in turn convey it to the collection points. The waste from the primary collection points are transported by the conservancy workers (ULBs or private) to the secondary collection points and dumper placers through wheel borrows and hand carts. From the secondary collection points, collection vehicles of capacities varying from 6 tonnes to 1 tonne pick up the waste and transport the same to nearest transfer stations. Half of the city area is privatized for lifting from the collection points (RCC bins) and transportation of the waste. In the other half of the city area, RMC vehicles are used for the purpose of collection, lifting and transportation of the waste.

Treatment and processing

The mixed solid waste, unloaded in the premises of the plant, is stacked as heaps. An effective micro-organisms (EM solution) is sprayed on the heaps to accelerate the bacteriological decomposition, to reduce the volume and to control odour nuisance. The processed heap is sorted manually in a conveyor for removal of glass pieces, stones and then allowed on to the sieves for separation of sand, dust and other inorganic substances. These screened materials are allowed on to the magnetic separators for segregation of iron pieces.

MSW then is homogenized and taken to the rotary screen for separating different sized articles. Large size fractions are passed through magnetic separators before taking into primary shredder for further size reduction.

MSW contains high moisture percentage and requires to be dried up by hot air generated in a hot air generator and is again screened to separate sand/ grit material. The heavy non-combustibles like stones or glass are separated by Air Density Separator. The light combustibles like paper/ textile/ bio-mass separated in the process are called RDF fluff. RDF fluffs are further processed in secondary shredder and densification unit to produce RDF pellets. Dried combustible material having 5 x 12 inches is RDF (Refuse Derived Fuel) and its calorific value is about 3500 kcal/kg.

The wet organic waste has been processed as organic manure through windrow composting. Plastics, separated from the Municipal Solid Waste, have been made into plastic ingots which is a raw material for many plastic goods. The sand, silt collected through street sweeping and desilting of drains have been used for manufacture of bricks. The sand derived from construction and demolition waste is also used for this purpose. The private operator has invested about Rs.22 Crores for developing the project. The Corporation has made 'tipping fee' payment to the operator for the quantity of rejects and inert supplied at the landfill site (about 20% of the total waste generation).

12 PUBLIC PRIVATE PARTNERSHIP

The term "public-private partnership" (PPP) describes a spectrum of possible relationships between public and private actors for the cooperative provision of infrastructure services. The only essential ingredient is some degree of private participation in the delivery of traditionally public-domain services. Private actors may include private business holders, as well as Non Governmental Organisations (NGOs) and Community-Based Organisations (CBOs). Through PPPs, the advantages of the private sector -innovation, access to finance, knowledge of technologies, managerial efficiency, and entrepreneurial spirit –are combined with the social responsibility, environmental awareness, and local knowledge of the public sector in an effort to solve problems. In cities throughout the world, private firms have demonstrated their ability to improve the operation of infrastructure services.

However, it is important to bear in mind that private involvement does not provide an automatic solution to urban infrastructure problems. Private sector participation could help to bring technical and managerial expertise, improve operating efficiency, large scale injection of capital, greater efficiency in using the capital, rationalization /cost based tariffs for services, better responsiveness to consumer needs and satisfaction Though it is clear that private sector participation is necessary and it could bring definite advantages to the system, it would be worth while to look into those critical factors which do or undo the partnership or the successful running of it. Selection of the Concessionaire will be based on open competitive bidding. These are two stages of bid process to be followed while selecting the concessionaire.

1. Request for Qualification(RFQ) (***Annexure V***)
2. Request for Proposal(RFP)

Whenever the Private Public Partnership (PPP) model is to be adopted for final disposal, there may be a need to develop "ROYALTY/ TIPPING FEE" policy to make the PPP initiative an economically viable step. The concept of tipping fee will also cover transportation stage if PPP is used as a strategy for transportation.

Since 2003, India has two 'zero-garbage' towns. Suryapet in Andhra Pradesh (population 103,000 in 34 sq km) and Namakkal in Tamil Nadu (pop. 53,000 in 10 sq km) are both self-motivated **"Zero-Garbage Towns"** since 2003 without any external funding whatsoever, with almost complete compliance with MSW Rules. This has been achieved simply through the political will of the elected members, the sincerity of the municipal staff, and excellent cooperation from the public. Both are dust-bin-free cities where cleaning is done every day of the week and no waste is burnt anywhere.

Further, Namakkal Municipality is the first Urban Local Body in India which got ISO 14001-2004 certification, exclusively meant for the better Environmental Management system.

In TamilNadu, the Commissioner of Municipal Administration has taken sincere steps to implement the solid waste management projects under Public Private Partnership mode in Coimbatore and Madurai Corporations and in Namakkal Municipality and the projects are under progress.

13 MSW MANAGEMENT CONTRACT

The entire process of Solid Waste Management could be brought under service provider who will operate all components of SWM till disposal at designated processing and landfill site taking into consideration the existing arrangements in the ULBs. The selection process for identification of private operator under solid waste management contract shall be done through tenders and as per model document in the Annexure V.

14 PROCUREMENT OF EQUIPMENTS AND VEHICLES

The types of equipments and vehicles for the operations of the SWM have been specified. The choice of vehicle should be based on the narrative requirement depending on the class of the city/town

14.1 SPECIFICATIONS OF TOOLS, EQUIPMENTS AND VEHICLES IN ULBS

(Refer Annexure IV)

15 ACTION PLAN

The ULBs shall prepare action plan to implement MSW Rules with the following objectives.

a) To carry out the waste management activities (collection, transportation, treatment and disposal) in a manner, which is not just environmentally, socially and financially sustainable but also economically viable
b) To establish an integrated and self contained operating framework for MSWM, which would include the development of appropriate means and technologies to handle various waste management activities
c) To enhance the activity of ULBs to provide effective waste management services to their citizens.

16 MONITORING MECHANISM

The Municipal Solid Waste Rules 2000 specify the compliance criteria for different parameters under Management of Municipal Solid Waste in schedule I of the MSW rules 2000 and these must be achieved. However, as far as, sanitary landfills are concerned, the time needed will be decided based on land availability and financial resources.

To implement the MSW Rules and monitor the activities of implementation the following two committees shall be formed.

1. ENVIRONMENTAL PRESERVATION COMMITTEE

The Environmental preservation Committee will be headed by the Chairperson of the ULB with members consisting of Commissioner/Executive Officer, District Environmental Engineer, Officers from State Highways, Public Works Department, Assistant Educational Officer, Deputy Superintendent of Police, Revenue Divisional Officer, President, Federation of the Resident Welfare Associations, and

Prominent Environmentalist who resides in the respective ULB. This Committee will meet once in three months to monitor the measures and initiatives taken by the ULB in respect of Environment.

2. IMPLEMENTATION AND REVIEW COMMITTEE

The Implementation Committee will meet once in 15 days with members consisting of Municipal Commissioner, Municipal Engineer, Municipal Health Officer/Sanitary Officer, Sanitary Inspectors, Municipal Councillors from any two wards, President, Community Development Society or Self Help Group. This committee shall implement the measures suggested by the Environmental Preservation Committee.

17 INFORMATION, EDUCATION & COMMUNICATION ACTIVITY (IEC)

Solid Waste Management is an activity in which public participation holds the key to success. Implementation of better solid waste management can be achieved only if there is active and effective community participation. Information, Education and Communication (IEC) activities play major role in achieving the success of the implementation of modern MSWM. Awareness amongst the community and different stakeholders to meet the demands of the new system for a cleaner environment requires a detailed and thorough understanding at every stage. Involvement of community is going to be the main thrust of the programme. Awareness and education campaigns should target municipal authorities, elected representatives, schools, non governmental organizations (NGOs),media, trade associations, families and the public at large.

The main objectives of IEC are to make people understand

- The concept of and need for source segregation
- The need to store waste at source in two separate receptacles - one for bio degradable and another for recyclable
- The role of citizens in primary collection of waste from the household and handing over to waste collectors
- The need to pay for waste collection and disposal services
- The need to use litter bins on road sides and public places.
- The impact of solid waste on public health and the environment.

The following methods can be used to generate awareness among the public.

- Door to Door awareness and motivation programmes using
  - Pamphlets, brochures, hoardings, banners, handbills, posters etc.,
- Organising rallies
- Celebration of major occasions (eg. Environment day)
- Conducting Street plays
- Mass cleaning-‘Clean up drive’
- School Programmes
  - Formation of ‘eco clubs’ in schools, organization of competitions
  - Involvement of NCC, NSS, Scouts
- Involvement of cine artists, political and religious leaders
- Involvement of NGOs, RWAs, SHGs, etc.,
- Presenting Awards through Competitions (eg. Eco house, Clean house)
- Incentives to households, commercial establishments
- Mass communication methods

- Print media (advertisements at regular intervals)
- Television, Cable TV, Radio and Websites
- Cinema theatres (display of slides)

IEC activities shall be taken up, with the involvement of leading NGOs/advertising agencies, who could be utilized after a careful selection process. Materials required for the IEC campaign like manuals, flipcharts and other media communication could be designed by these agencies.

ANNEXURES

ANNEXURE-I

The Municipal Solid Wastes (Management and Handling) Rules, 2000

Ministry of Environment and Forests Notification

New Delhi, the 25th September, 2000

S.O. 908(E).- Whereas the draft of the Municipal Solid Wastes (Management and Handling) Rules, 1999 were published under the notification of the Government of India in the Ministry of Environment and Forests number S.O. 783(E), dated, the 27th September, 1999 in the Gazette of India, Part II, Section 3, Sub-section (ii) of the same date inviting objections and suggestions from the persons likely to be affected thereby, before the expiry of the period of sixty days from the date on which the copies of the Gazette containing the said notification are made available to the public;

And whereas copies of the said Gazette were made available to the public on the 5th October, 1999;

And whereas the objections and suggestions received from the public in respect of the said draft rules have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by section 3, 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules to regulate the management and handling of the municipal solid wastes, namely :-

1. Short title and commencement:--

1. These rules may be called the Municipal Solid Wastes (Management and Handling) Rules, 2000.
2. Save as otherwise provided in these rules, they shall come into force on the date of their publication in the Official Gazette.

2. Application:--

These rules shall apply to every municipal authority responsible for collection, segregation, storage, transportation,, processing and disposal of municipal solid wastes .

3. Definitions:--

In these rules, unless the context otherwise requires ,--

i. **"anaerobic digestion"** means a controlled process involving microbial decomposition of organic matter in the absence of oxygen;
ii. **"authorization"** means the consent given by the Board or Committee to the "operator of a facility" ;
iii. "**biodegradable substance"** means a substance that can be degraded by micro-organisms;
iv. **"biomethanation"** means a process which entails enzymatic decomposition of the organic matter by microbial action to produce methane rich biogas;
v. **"collection"** means lifting and removal of solid wastes from collection points or any other location;
vi. "**composting"** means a controlled process involving microbial decomposition of organic matter;

vii. "**demolition and construction waste"** means wastes from building materials debris and rubble resulting from construction, re-modelling, repair and demolition operation;

viii. "**disposal"** means final disposal of municipal solid wastes in terms of the specified measures to prevent contamination of ground-water, surface water and ambient air quality;

ix. **"Form"** means a Form appended to these rules;

x. **"generator of wastes"** means persons or establishments generating municipal solid wastes;

xi. "**landfilling"** means disposal of residual solid wastes on land in a facility designed with protective measures against pollution of ground water, surface water and air fugitive dust, wind-blown litter, bad odour, fire hazard, bird menace, pests or rodents, greenhouse gas emissions, slope instability and erosion;

xii. "**leachate"** means liquid that seeps through solid wastes or other medium and has extracts of dissolved or suspended material from it;

xiii. "**lysimeter"** is a device used to measure rate of movement of water through or from a soil layer or is used to collect percolated water for quality analysis;

xiv. **"municipal authority"** means Municipal Corporation, Municipality, Nagar Palika, Nagar Nigam, Nagar Panchayat, Municipal Council including notified area committee (NAC) or any other local body constituted under the relevant statutes and, where the management and handling of municipal solid waste is entrusted to such agency;

xv. **"municipal solid waste"** includes commercial and residential wastes generated in a municipal or notified areas in either solid or semi-solid form excluding industrial hazardous wastes but including treated bio-medical wastes;

xvi. **"operator of a facility"** means a person who owns or operates a facility for collection, segregation, storage, transportation, processing and disposal of municipal solid wastes and also includes any other agency appointed as such by the municipal authority for the management and handling of municipal solid wastes in the respective areas;

xvii. **"pelletisation"** means a process whereby pellets are prepared which are small cubes or cylindrical pieces made out of solid wastes and includes fuel pellets which are also referred as refuse derived fuel;

xviii. "**processing"** means the process by which solid wastes are transformed into new or recycled products;

xix. "r**ecycling"** means the process of transforming segregated solid wastes into raw materials for producing new products, which may or may not be similar to the original products;

xx. **"Schedule"** means a Schedule appended to these rules;

xxi. **"segregation"** means to separate the municipal solid wastes into the groups of organic, inorganic, recyclables and hazardous wastes;

xxii. **"State Board or the Committee"** means the State Pollution Control Board of a State, or as the case may be, the Pollution Control Committee of a Union territory;

xxiii. **"storage"** means the temporary containment of municipal solid wastes in a manner so as to prevent littering, attraction to vectors, stray animals and excessive foul odour;

xxiv. **"transportation "** means conveyance of municipal solid wastes from place to place hygienically through specially designed transport system so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors;

xxv. "**vadose water"** water which occurs between the ground, surface and the water table that is the unsaturated zone;

xxvi. "**vermicomposting"** is a process of using earthworms for conversion of bio-degradable wastes into compost.

4. Responsibility of municipal authority:--

1. Every municipal authority shall, within the territorial area of the municipality, be responsible for the implementation of the provisions of these rules, and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes.
2. The municipal authority or an operator of a facility shall make an application in **Form-I,** for grant of authorization for setting up waste processing and disposal facility including landfills from the State Board or the Committee in order to comply with the implementation programme laid down in **Schedule I**.
3. The municipal authority shall comply with these rules as per the implementation schedule laid down in **Schedule I.**
4. The municipal authority shall furnish its annual report in **Form-II**,-
   a. to the Secretary-incharge of the Department of Urban Development of the concerned State or as the case may be of the Union territory, in case of a metropolitan city; or
   b. to the District Magistrate or the Deputy Commissioner concerned in case of all other towns and cities,

with a copy to the State Board or the Committee on or before the 30th day of June every year.

5. Responsibility of the State Government and the Union territory Administrations:--

(1) The Secretary-incharge of the Department of Urban Development of the concerned State or the Union territory, as the case may be, shall have the overall responsibility for the enforcement of the provisions of these rules in the metropolitan cities.
(2) The District Magistrate or the Deputy Commissioner of the concerned district shall have the overall responsibility for the enforcement of the provisions of these rules within the territorial limits of their jurisdiction.

6. Responsibility of the Central Pollution Control Board and the State Board or the Committees:--

1. The State Board or the Committee shall monitor the compliance of the standards regarding ground water, ambient air, leachate quality and the compost quality including incineration standards as specified under **Schedules II, III** and **IV**.
2. The State Board or the Committee, after the receipt of application from the municipal authority or the operator of a facility in **Form I,** for grant of authorization for setting up waste processing and disposal facility including landfills, shall examine the proposal taking into consideration the views of other agencies like the State Urban Development Department, the Town and Country Planning Department, Air Port or Air Base Authority, the Ground Water Board or any such other agency prior to issuing the authorization.
3. The State Board or the Committee shall issue the authorization in **Form-III** to the municipal authority or an operator of a facility within forty-five days stipulating compliance criteria and standards as specified in **Schedules II, III** and **IV** including such other conditions, as may be necessary.
4. The authorization shall be valid for a given period and after the validity is over, a fresh authorization shall be required.
5. The Central Pollution Control Board shall co-ordinate with the State Boards and the Committees with particular reference to implementation and review of standards and guidelines and compilation of monitoring data.

7. Management of municipal solid wastes:--

1. Any municipal solid waste generated in a city or a town, shall be managed and handled in accordance with the compliance criteria and the procedure laid down in **Schedule-II.**
2. The waste processing and disposal facilities to be set up by the municipal authority on their own or through an operator of a facility shall meet the specifications and standards as specified in **Schedules III** and **IV.**

8. Annual Reports:--

1. The State Boards and the Committees shall prepare and submit to the Central Pollution Control Board an annual report with regard to the implementation of these rules by the 15th of September every year in **Form-IV**.
2. The Central Pollution Control Board shall prepare the consolidated annual review report on management of municipal solid wastes and forward it to the Central Government along with its recommendations before the 15th of December every year.

9. Accident Reporting:--

When an accident occurs at any municipal solid wastes collection, segregation, storage, processing, treatment and disposal facility or landfill site or during the transportation of such wastes, the municipal authority shall forthwith report the accident in **Form-V** to the Secretary in-charge of the Urban Development Department in metropolitan cities, and to District Collector or Deputy Commissioner in all other cases.

Schedule I

[see rules4(2) and (3)]

Implementation Schedule

Serial No.	Compliance Criteria	Schedule
1.	Setting up of waste processing and disposal facilities	By 31.12.2003 or earlier
2.	Monitoring the performance of waste processing and disposal facilities	Once in six months
3.	Improvement of existing landfill sites as per provisions of these rules	By 31.12.2001 or earlier
4.	Identification of landfill sites for future use and making site (s) ready for operation	By 31.12.2002 or earlier

Schedule -II

[see rules 6(1) and (3), 7(1)]

Management of Municipal Solid Wastes

S.No	Parameters	Compliance criteria
1.	**Collection of municipal solid wastes**	1. Littering of municipal solid waste shall be prohibited in cities, towns and in urban areas notified by the State Governments. To prohibit littering and facilitate compliance, the following steps shall be taken by the municipal authority, namely :- i. Organising house-to-house collection of municipal solid wastes through any of the methods, like community bin collection (central bin), house-to-house collection, collection on regular pre-informed timings and scheduling by using bell ringing of musical vehicle (without exceeding permissible noise levels); ii. Devising collection of waste from slums and squatter areas or localities including hotels, restaurants, office complexes and commercial areas; iii. Wastes from slaughter houses, meat and fish markets, fruits and vegetable markets, which are biodegradable in nature, shall be managed to make use of such wastes; iv. Bio-medical wastes and industrial wastes shall not be mixed with municipal solid wastes and such wastes shall follow the rules separately specified for the purpose; v. Collected waste from residential and other areas shall be transferred to community bin by hand-driven containerised carts or other small vehicles; vi. Horticlutural and construction or demolition wastes or debris shall be separately collected and disposed off following proper norms. Similarly, wastes generated at dairies shall be regulated in accordance with the State laws; vii. Waste (garbage, dry leaves) shall not be burnt; viii. Stray animals shall not be allowed to move around waste storage facilities or at any other place in the city or town and shall be managed in accordance with the State laws. 2. The municipal authority shall notify waste collection schedule and the likely method to be adopted for public benefit in a city or town. 3. It shall be the responsibility of generator of wastes to avoid littering and ensure delivery of wastes in accordance with the collection and segregation system to be notified by the municipal authority as per para 1(2) of this Schedule.

2.	**Segregation of municipal solid wastes**	In order to encourage the citizens, municipal authority shall organise awareness programmes for segregation of wastes and shall promote recycling or reuse of segregated materials. The municipal authority shall undertake phased programme to ensure community participation in waste segregation. For this purpose, regular meetings at quarterly intervals shall be arranged by the municipal authorities with representatives of local resident welfare associations and non-governmental organizations.
3.	**Storage of municipal solid wastes**	Municipal authorities shall establish and maintain storage facilities in such a manner as they do not create unhygienic and insanitary conditions around it. Following criteria shall be taken into account while establishing and maintaining storage facilities, namely :- i. Storage facilities shall be created and established by taking into account quantities of waste generation in a given area and the population densities. A storage facility shall be so placed that it is accessible to users; ii. Storage facilities to be set up by municipal authorities or any other agency shall be so designed that wastes stored are not exposed to open atmosphere and shall be aesthetically acceptable and user-friendly; iii. Storage facilities or 'bins' shall have 'easy to operate' design for handling, transfer and transportation of waste. Bins for storage of bio-degradable wastes shall be painted green, those for storage of recyclable wastes shall be printed white and those for storage of other wastes shall be printed black; iv. Manual handling of waste shall be prohibited. If unavoidable due to constraints, manual handling shall be carried out under proper precaution with due care for safety of workers.
4.	**Transportation of municipal solid wastes**	Vehicles used for transportation of wastes shall be covered. Waste should not be visible to public, nor exposed to open environment preventing their scattering. The following criteria shall be met, namely:- i. The storage facilities set up by municipal authorities shall be daily attended for clearing of wastes. The bins or containers wherever placed shall be cleaned before they start overflowing; ii. Transportation vehicles shall be so designed that multiple handling of wastes, prior to final disposal, is avoided.

5.	**Processing of municipal solid wastes**	Municipal authorities shall adopt suitable technology or combination of such technologies to make use of wastes so as to minimize burden on landfill. Following criteria shall be adopted, namely:- i. The biodegradable wastes shall be processed by composting, vermin composting, anaerobic digestion or any other appropriate biological processing for stabilization of wastes. It shall be ensured that compost or any other end product shall comply with standards as specified in Schedule-IV; ii. Mixed waste containing recoverable resources shall follow the route of recycling. Incineration with or without energy recovery including pelletisation can also be used for processing wastes in specific cases. Municipal authority or the operator of a facility wishing to use other state-of-the-art technologies shall approach the Central Pollution Control Board to get the standards laid down before applying for grant of authorisation.
6.	**Disposal of municipal solid wastes**	Land filling shall be restricted to non-biodegradable, inert waste and other waste that are not suitable either for recycling or for biological processing. Land filling shall also be carried out for residues of waste processing facilities as well as pre-processing rejects from waste processing facilities. Land filling of mixed waste shall be avoided unless the same is found unsuitable for waste processing. Under unavoidable circumstances or till installation of alternate facilities, land-filling shall be done following proper norms. Landfill sites shall meet the specifications as given in Schedule –III.

Schedule III

[see rules 6(1) and (3), 7(2)]

Specifications for Landfill Sites

Site Selection

1. In areas falling under the jurisdiction of 'Development Authorities' it shall be the responsibility of such Development Authorities to identify the landfill sites and hand over the sites to the concerned municipal authority for development, operation and maintenance. Elsewhere, this responsibility shall lie with the concerned municipal authority.
2. Selection of landfill sites shall be based on examination of environmental issues. The Department of Urban Development of the State or the Union territory shall co-ordinate with the concerned organisations for obtaining the necessary approvals and clearances.
3. The landfill site shall be planned and designed with proper documentation of a phased construction plan as well as a closure plan.
4. he landfill sites shall be selected to make use of nearby wastes processing facility. Otherwise, wastes processing facility shall be planned as an integral part of the landfill site.
5. The existing landfill sites which continue to be used for more than five years, shall be improved in accordance of the specifications given in this Schedule.
6. Biomedical wastes shall be disposed off in accordance with the Bio-medical Wastes (Management and Handling) Rules, 1998 and hazardous wastes shall be managed in accordance with the Hazardous Wastes (Management and Handling) Rules, 1989, as amended from time to time.
7. The landfill site shall be large enough to last for 20-25 years.
8. The landfill site shall be away from habitation clusters, forest areas, water bodies monuments, National Parks, Wetlands and places of important cultural, historical or religious interest.
9. A buffer zone of no-development shall be maintained around landfill site and shall be incorporated in the Town Planning Department's land-use plans.
10. Landfill site shall be away from airport including airbase. Necessary approval of airport or airbase authorities prior to the setting up of the landfill site shall be obtained in cases where the site is to be located within 20 km of an airport or airbase..

Facilities at the Site

11. Landfill site shall be fenced or hedged and provided with proper gate to monitor incoming vehicles or other modes of transportation.
12. The landfill site shall be well protected to prevent entry of unauthorised persons and stray animals.
13. Approach and other internal roads for free movement of vehicles and other machinery shall exist at the landfill site.
14. The landfill site shall have wastes inspection facility to monitor wastes brought in for landfill, office facility for record keeping and shelter for keeping equipment and machinery including pollution monitoring equipments.
15. Provisions like weigh bridge to measure quantity of waste brought at landfill site, fire protection equipments and other facilities as may be required shall be provided.

16. Utilities such as drinking water (preferably bathing facilities for workers) and lighting arrangements for easy landfill operations when carried out in night hours shall be provided.
17. Safety provisions including health inspections of workers at landfill site shall be periodically made.

Specifications for land filling

18. Wastes subjected to land filling shall be compacted in thin layers using landfill compactors to achieve high density of the wastes. In high rainfall areas where heavy compactors cannot be used alternative measures shall be adopted.
19. Wastes shall be covered immediately or at the end of each working day with minimum 10 cm of soil, inert debris or construction material till such time waste processing facilities for composting or recycling or energy recovery are set up as per Schedule I.
20. Prior to the commencement of monsoon season, an intermediate cover of 40-65 cm thickness of soil shall be placed on the landfill with proper compaction and grading to prevent infiltration during monsoon. Proper drainage berms shall be constructed to divert run-off away from the active cell of the landfill.
21. After completion of landfill, a final cover shall be designed to minimize infiltration and erosion. The final cover shall meet the following specifications, namely :--

    a. a.The final cover shall have a barrier soil layer comprising of 60 cms of clay or amended soil with permeability coefficient less that 1 x 10^{-7} cm/sec.
    b. b. On top of the barrier soil layer there shall be a drainage layer of 15 cm.
    c. c.On top of the drainage layer there shall be a vegetative layer of 45 cm to support natural plant growth and to minimize erosion.

Pollution prevention

22. In order to prevent pollution problems from landfill operations, the following provisions shall be made, namely:-
    a. Diversion of storm water drains to minimize leachate generation and prevent pollution of surface water and also for avoiding flooding and creation of marshy conditions;
    b. Construction of a non-permeable lining system at the base and walls of waste disposal area. For landfill receiving residues of waste processing facilities or mixed waste or waste having contamination of hazardous materials (such as aerosols, bleaches, polishes, batteries, waste oils, paint products and pesticides) minimum liner specifications shall be a composite barrier having 1.5 mm high density polyethylene (HDPE) geomembrane, or equivalent, overlying 90 cm of soil (clay or amended soil) having permeability coefficient not greater than 1 x 10^{-7} cm/sec. The highest level of water table shall be at least two meter below the base of clay or amended soil barrier layer;
    c. Provisions for management of leachates collection and treatment shall be made. The treated leachates shall meet the standards specified in Schedule- IV;
    d. Prevention of run-off from landfill area entering any stream, river, lake or pond.

Water Quality Monitoring

23. Before establishing any landfill site, baseline data of ground water quality in the area shall be collected and kept in record for future reference. The ground water quality within 50 metres of the periphery of landfill site shall be periodically monitored to ensure that the ground

water is not contaminated beyond acceptable limit as decided by the Ground Water Board or the State Board or the Committee. Such monitoring shall be carried out to cover different seasons in a year that is, summer, monsoon and post-monsoon period.

24. Usage of groundwater in and around landfill sites for any purpose (including drinking and irrigation) is to be considered after ensuring its quality. The following specifications for drinking water quality shall apply for monitoring purpose, namely :-

S.No.	Parameters	IS 10500: 1991 Desirable limit (mg/l except for pH)
1.	Arsenic	0.05
2.	Cadmium	0.01
3	Chromium	0.05
4.	Copper	0.05
5.	Cyanide	0.05
6.	Lead	0.05
7.	Mercury	0.001
8.	Nickel	-
9.	Nitrate as NO3	45.0
10	PH	6.5-8.5
11.	Iron	0.3
12.	Total hardness (as CaCO3)	300.0
13.	Chlorides	250
14.	Dissolved solids	500
15.	Phenolic compounds (as C6H5OH)	0.001
16.	Zinc	5.0
17.	Sulphate (as SO4)	200

Ambient Air Quality Monitoring

23. Installation of landfill gas control system including gas collection system shall be made at landfill site to minimize odour generation, prevent off-site migration of gases and to protect vegetation planted on the rehabilitated landfill surface.
24. The concentration of methane gas generated at landfill site shall not exceed 25 per cent of the lower explosive limit (LEL).
25. The landfill gas from the collection facility at a landfill site shall be utilized for either direct thermal applications or power generation, as per viability. Otherwise, landfill gas shall be burnt (flared) and shall not be allowed to directly escape to the atmosphere or for illegal tapping. Passive venting shall be allowed if its utilization or flaring is not possible.
26. Ambient air quality at the landfill site and at the vicinity shall be monitored to meet the following specified standards, namely :-

S.No.	Parameters	Acceptable levels
(i)	Sulphur dioxide	120 m g/m^3 (24 hours)
(ii)	Suspended Particulate Matter	500 m g/m^3 (24 hours)
(iii)	Methane	Not to exceed 25 per cent of the lower explosive limit (equivalent to 650 mg/m^3)
(iv)	Ammonia daily average	
	(Sample duration 24 hrs)	0.4 mg/m3 (400 m g/m3)
(v)	Carbon monoxide	1 hour average : 2 mg/m3 8 hour average : 1 mg/m

27. The ambient air quality monitoring shall be carried out by the concerned authority as per the following schedule, namely:-
    (a) Six times in a year for cities having population of more than fifty lakhs;
    (b) Four times in a year for cities having population between ten and fifty lakhs;
    (c) Two times in a year for town or cities having population between one and ten lakhs.

Plantation at Landfill Site

28. A vegetative cover shall be provided over the completed site in accordance with the and following specifications, namely :-
    (a) Selection of locally adopted non-edible perennial plants that are resistant to drought and extreme temperatures shall be allowed to grow;
    (b) The plants grown be such that their roots do not penetrate more than 30 cms. This condition shall apply till the landfill is stabilised;
    (c) Selected plants shall have ability to thrive on low-nutrient soil with minimum nutrient addition;
    (d) Plantation to be made in sufficient density to minimize soil erosion.

Closure of Landfill Site and Post-care

29. The post-closure care of landfill site shall be conducted for at least fifteen years and long term monitoring or care plan shall consist of the following, namely :-
    (a) Maintaining the integrity and effectiveness of final cover, making repairs and preventing run-on and run-off from eroding or otherwise damaging the final cover;
    (b) Monitoring leachate collection system in accordance with the requirement;
    (c) Monitoring of ground water in accordance with requirements and maintaining ground water quality;
    (d) Maintaining and operating the landfill gas collection system to meet the standards.

30. Use of closed landfill sites after fifteen years of post-closure monitoring can be considered for human settlement or otherwise only after ensuring that gaseous and leachate analysis comply with the specified standards.

Special provisions for hilly areas

33. Cities and towns located on hills shall have location-specific methods evolved for final disposal of solid wastes by the municipal authority with the approval of the concerned State Board or the Committee. The municipal authority shall set up processing facilities for utilization of biodegradable organic wastes. The inert and non-biodegradable waste shall be used for building roads or filling-up of appropriate areas on hills. Because of constraints in finding adequate land in hilly areas, wastes not suitable for road-laying or filling up shall be disposed of in specially designed landfills.

Schedule IV

[see rules 6(1) and (3), 7(2)]

Standards for Composting, Treated Leachates and Incineration

1. The waste processing or disposal facilities shall include composting, incineration, pelletisation, energy recovery or any other facility based on state-of-the-art technology duly approved by the Central Pollution Control Board
2. In case of engagement of private agency by the municipal authority, a specific agreement between the municipal authority and the private agency shall be made particularly, for supply of solid waste and other relevant terms and conditions.
3. In order to prevent pollution problems from compost plant and other processing facilities, the following shall be complied with, namely :-
   i. The incoming wastes at site shall be maintained prior to further processing. To the extent possible, the waste storage area should be covered. If, such storage is done in an open area, it shall be provided with impermeable base with facility for collection of leachate and surface water run-off into lined drains leading to a leachate treatment and disposal facility;
   ii. Necessary precautions shall be taken to minimise nuisance of odour, flies, rodents, bird menace and fire hazard;
   iii. In case of breakdown or maintenance of plant, waste intake shall be stopped and arrangements be worked out for diversion of wastes to the landfill site;
   iv. Pre-process and post-process rejects shall be removed from the processing facility on regular basis and shall not be allowed to pile at the site. Recyclables shall be routed through appropriate vendors. The non-recyclables shall be sent for well designed landfill site(s).
   v. In case of compost plant, the windrow area shall be provided with impermeable base. Such a base shall be made of concrete or compacted clay, 50 cm thick, having permeability coefficient less than 10^{-7} cm/sec. The base shall be provided with 1 to 2 per cent slope and circled by lined drains for collection of leachate or surface run-off;
   vi. Ambient air quality monitoring shall be regularly carried out particularly for checking odour nuisance at down-wind direction on the boundary of processing plant.

   In order to ensure safe application of compost, the following specifications for compost quality shall be met, namely:-

Parameters	Concentration not to exceed * (mg/kg dry basis , except pH value and C/N ratio)
Arsenic	10.00
Cadmium	5.00
Chromium	50.00
Copper	300.00
Lead	100.00
Mercury	0.15
Nickel	50.00

Zinc	1000.00
C/N ratio	20-40
PH	5.5-8.5

* Compost (final product) exceeding the above stated concentration limits shall not be used for food crops. However, it may be utilized for purposes other than growing food crops.

4. The disposal of treated leachates shall follow the following standards, namely:-

S.No	Parameter	Standards (Mode of Disposal)		
		Inland surface water	Public sewers	Land disposal
1.	Suspended solids, mg/l, max	100	600	200
2.	Dissolved solids (inorganic) mg/l, max.	2100	2100	2100
3	PH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
4	Ammonical nitrogen (as N), mg/l, max.	50	50	-
5	Total Kjeldahl nitrogen (as N), mg/l, max.	100	-	-
6	Biochemical oxygen demand (3 days at 270 C) max.(mg/l)	30	350	100
7	Chemical oxygen demand, mg/l, max.	250	-	-
8	Arsenic (as As), mg/l, max	0.2	0.2	0.2
9	Mercury (as Hg), mg/l, max	0.01	0.01	-
10	Lead (as Pb), mg/l, max	0.1	1.0	-
11	Cadmium (as Cd), mg/l, max	2.0	1.0	-
12	Total Chromium (as Cr), mg/l, max.	2.0	2.0	-
13	Copper (as Cu), mg/l, max.	3.0	3.0	-
14	Zinc (as Zn), mg/l, max.	5.0	15	-
15	Nickel (as Ni), mg/l, max	3.0	3.0	-
16	Cyanide (as CN), mg/l, max.	0.2	2.0	0.2
17	Chloride (as Cl), mg/l, max.	1000	1000	600
18	Fluoride (as F), mg/l, max	2.0	1.5	-
19	Phenolic compounds (as C6H5OH) mg/l, max.	1.0	5.0	-

Note : While discharging treated leachates into inland surface waters, quantity of leachates being discharged and the quantity of dilution water available in the receiving water body shall be given due consideration.

The incinerators shall meet the following operating and emission standards, namely:-

A. Operating Standards

(1) The combustion efficiency (CE) shall be at least 99.00%.

(2) The combustion efficiency is computed as follows :

$$C.E. = \frac{\% CO_2}{\% CO_2 + \%CO} \times 100$$

Emission Standards

Parameters	Concentration mg/Nm^3 at (12% CO_2 correction)
(1) Particulate matter	150
(2) Nitrogen Oxides	450
(3) HCl	50
(4) Minimum stack height shall be 30 metres above ground	
(5) Volatile organic compounds in ash shall not be more than	0.01%.

Note :

1. Suitably designed pollution control devices shall be installed or retrofitted with the incinerator to achieve the above emission limits, if necessary.
2. Wastes to be incinerated shall not be chemically treated with any chlorinated disinfectants
3. Chlorinated plastics shall not be incinerated.
4. Toxic metals in incineration ash shall be limited within the regulatory quantities as specified in the Hazardous Wastes (Management and Handling) Rules, 1989 as amended from time to time.
5. Only low sulphur fuel like l.d.o., l.s.h.s or Diesel shall be used as fuel in the incinerator.

Form –I

[see rules 4(2) & 6(2)]

Application for obtaining authorization

To,
The Member Secretary

1.	Name of the municipal authority/Name of the agency appointed by the municipal authority	:	
2.	Correspondence address Telephone No. Fax No.	:	
3.	Nodal Officer & designation(Officer authorised by the municipal authority or agency responsible for operation of processing or disposal facility)	:	
4.	Authorization applied for (Please tick mark)	:	(a) Setting up & operation of waste processing facility (b) Setting up & operation of disposal facility
5.	Detailed proposal of waste processing/disposal facility (to be attached) to include	:	
5.1	**Processing of Waste** i. Location of site ii. Name of waste processing technology iii. Details of processing technology iv. Quantity of waste to be processed per day v. Site clearance (from local authority) vi. Details of agreement between municipal authority and operating agency vii. Utilization programme for waste processed (Product utilization) viii. Methodology for disposal of waste processing rejects (quantity and quality) ix. Measures to be taken for prevention and control of environmental pollution x. Investment on Project and expected returns xi. Measures to be taken for safety of workers working in the plant	:	

5.2	**Disposal of Waste** i. Number of sites identified ii. Layout maps of site iii. Quantity of waste to be disposed per day iv. Nature and composition of waste v. Details of methodology or criteria followed for vi.site selection vi. Details of existing site under operation vii. Methodology and operational details of landfilling viii. Measures taken to check environmental pollution	:	
Date			Signature of Nodal Officer

Form - II

[See rule 4(4)]

Format of Annual Report to be submitted by the Municipal Authority

i. Name of City/Town:……
ii. Population ……
iii. Name of municipal body:…….....…… and
Address ……..
.....……

Telephone No. : …….

Fax : ……

iv. Name of Incharge dealing with municipal solid wastes ….....……
……..…….....…… with designation
……..

1. Quantity and composition of solid wastes

(i) Total quantity of wastes generated per day

(ii) Total quantity of wastes collected per day

(iii) Total quantity of wastes processed for :

a. Composting:……
b. Vermiculture:……..
c. Pellets: ……
d. Others, if any, please specify:……..…….

(iv) Total quantity of waste disposed by landfilling:

…….

a. no. of landfill sites used : ……
b. Area used: ……
c. Whether Weigh bridge facilities available : Yes/No
a. Whether area is fenced : Yes/No
a. Lighting facility on site : Yes/No
(f) Whether equipment like Bulldozer, Compactors etc. available. (Please specify) : ---------- ----------
a. Total Manpower available on site: ----------
a. Whether covering is done on daily basis : Yes/No

i. Whether covering material is used and whether it is adequately available :

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a. Provisions for gas venting provided : Available (Yes/No) /Not available
a. Provision for leachate collection : Provisions made/ Provisions not made

2. Storage facilities

(i) Area covered for collection of wastes	:	----------
(ii) no. of houses covered	:	----------
(iii) Whether house-to-house collection is practised (if yes, whether done by Municipality or through Private Agency or Non-Governmental Organisation)	:	----------
(iv) Bins	:	---------- Specifications Existing Proposed (Shape & Size) Numbers for future ----------
a. RCC Bins (Capacity)	:	
b. Trolleys (Capacity)	:	
c. Containers (Capacity)	:	
d. Dumper Placers	:	
e. Others, please specify	:	
(v) Whether all bins/collection spots are attended for daily lifting of garbage	:	Yes/No
(vi) Whether lifting of garbage from dustbins is manual or mechanical i.e. for example by using of front-end loaders (Please tick mark)	:	Manual/Loader/Others, please specify

3. Transportation

	Existing number	Actually Required/Proposed
(i) Truck :		
(ii) Truck-Tipper :		
(iii) Tractor-Trailer :		
(iv) Refuse-collector :		
(v) Dumper-placers :		
(vi) Animal Cart :		
(vii) Tricycle :		
(viii) Others (please specify) :		

4. Whether any proposal has been made to improve solid wastes management practices

5. Are any efforts made to call for private firms etc. to attempt for processing of waste utilising technologies like :

	Waste Utilisation Technology	Proposals	Steps taken (Quantity to be processed)
i. Composting :			
ii. Vermiculture :			
iii. Pelletisation :			
iv. Others if any, Please specify :			

6. **What provisions are available and how these are implemented to check unhygienic operations of :**
   i. Dairy related activities :
   ii. Slaughter houses and unauthorised slaughtering :
   iii. Malba (construction debris) lifting :
   iv. Encroachment in Parks, Footpaths etc. :

7. **How many slums are identified and whether these are provided with sanitation facilities :**

8. **Are municipal magistrates appointed for Taking penal action : Yes/No**

[If yes, how many cases registered & settled during last three years (give year-wise details)]

9. **Hospital Waste Management**
   i. How many Hospitals/Clinics under the control of the Corporation?
   ii. What methods are followed for disposal of bio-medical wastes ?
   iii. Do you have any proposal for setting up of common treatment facility for disposal of bio-medical wastes?
   iv. How many private Nursing Homes, Clinics etc. are operating in the city/town and what steps have been taken to check disposal of their wastes?

Signature of Municipal Commissioner

Dated :

Form –III

[See-rule 6(2)]

Format for Issue of Authorisation

File No.:_____

Date:_____

To,

_____

_____

_____

Ref: Your application number _____dt. _____

The _____State Pollution Control Board/Pollution Control Committee after examining the proposal hereby authorises_____having their administrative office at _____ _____to set up and operate waste processing/waste disposal facility at_____on the terms and conditions (including the standards to comply) attached to this authorization letter.

1. The validity of this authorization is till_____. After the validity, renewal of authorization is to be sought.
2. The _____State Pollution Control Board/Pollution Control Committees may, at any time, revoke any of the conditions applicable under the authorization and shall communicate the same in writing.
3. Any violation of the provision of the Municipal Solid Wastes (Management and Handling) Rules, 2000 will attract the penal provision of the Environment (Protection) Act, 1986 (29 of1986).

(Member Secretary)

State Pollution Control Board/
Pollution Control Committee

Date :
Place :

Form - IV

[see rule 8(1)]

Format of Annual Review Report to be submitted by the State Pollution Control Board/Committees to the Central Pollution Control Board

To,
The Chairman,
Central Pollution Control Board,
(Ministry of Environment and Forests)
Government of India,
'Parivesh Bhawan', East Arjun Nagar,
DELHI- 110 0032.

• 1.	Name of the State/Union territory	:	
2.	Name & address of the State Pollution Control	:	
3.	Board/Pollution Control Committee Number of municipal authorities responsible for management of municipal solid wastes in the State/Union territory under these rules	:	
4.	A Summary Statement on progress made by municipal authorities in respect of implementation of Schedule I [rule 4(3)]	:	Please attach as Annexure-I
5.	A Summary Statement on progress made by municipal authorities in respect of implementation of Schedule II [rules 6(1) and (3), 7(1)]	:	Please attach as Annexure-II
6.	A Summary Statement on progress made by municipal authorities in respect of implementation of Schedule III [rules 6(1) and (3), 7(2)]	:	Please attach as Annexure-III
7.	A summary statement on progress made by municipal authorities in respect of implementation of Schedule IV [rules 6(1) and (3), 7(2)]	:	Please attach as Annexure-IV

Date: _____ Place : _____	Chairman or the Member Secretary State Pollution Control Board/ Pollution Control Committee

Form - V

[see rule 9]

Accident reporting

1.	Date and time of accident	:	
2.	Sequence of events leading to accident	:	
3.	The waste involved in accident	:	
4.	Assessment of the effects of the accidents on human health and the environment	:	
5.	Emergency measures taken	:	
6.	Steps taken to alleviate the effects of accidents	:	
7.	Steps taken to prevent the recurrence of such an accident	:	

Date : ……	Signature : ……
Place : ……	Designation : ……

ANNEXURE II

Re-cycled Plastics Manufacture and Usage Rules, 1999

THE GAZETTE OF INDIA
EXTRAORDINARY

PART II – SECTION 3 – SUB-SECTION (II)

MINISTRY OF ENVIRONMENT AND FORESTS
NOTIFICATION

New Delhi, the 2nd September 1999

S. 0. 705 (F). Whereas draft rules in exercise of the powers conferred by clause (viii) of sub section (2) of section 3 read with section 25 of the Environment (Protection) Act, 1986 (29 of 1986) was published in the Gazette vide S.O. 980 (E) dated 20th November, 1998 entitled Recycled Plastics Usage Rules, 1998 inviting objections from the public within 60 days from the date of the publication of the said notification and whereas all objections received were duly considered;

Now, therefore, in exercise of the powers conferred by clause (viii) of sub-section (2) of section 3 read with section 25 of the Environment (Protection) Act. 1986, the Central Government hereby notifies the rules for the manufacture and use of recycled plastics carry bags and containers;

1. Short title and commencement: --

(a) These rules may be called the Recycled Plastics Manufacture and Usage Rules. 1999.
(b) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions: --

In these rules unless the context requires,

(a) "Act" means the Environment (Protection) Act, 1986:
(b) "Foodstuffs" means ready-to-eat food and food products. fast food, processed and cooked food in liquid, powder, solid or semi-solid form:
(c) "Vendor" means person who sells foodstuffs as defined above packaged and stored in plastic carry bags and containers.

3. Prescribed Authority: --

(a) The prescribed authority for enforcement of the provisions of these rules related to manufacture and recycling shall be the State Pollution Control Boards in respect of States and the Pollution Control Committees in respect of Union Territories;
(b) The prescribed authority for enforcement of the provisions of these rules related to the use, collection, segregation, transportation and disposal shall be the District Collector/Deputy Commissioner of the concerned district where no Such

Authority has been constituted by the State Government/Union Territory administration under any law regarding non-biodegradable garbage.

4. Prohibition of usage of carry bags -or containers made of recycled plastics: --

No vendor shall use carry bags or containers made of recycled plastics for storing, carrying, dispensing, or packaging of foodstuffs.

5. Conditions of Manufacture of carry bags and containers, made of plastics: --

Subject to the provisions of rule 4, any person may manufacture carry bags or containers made of plastics if the following conditions are satisfied, namely-.

(a) Carry bags and containers made of virgin plastic shall be in natural shade or white;
(b) Carry bags and containers made of recycled plastic and used for purposes other than storing and packaging foodstuffs shall be manufactured using pigments colourants as per IS: 9833:1981 entitled "List of pigments and colourants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water".

6. Recycling: --

Recycling of plastics shall be undertaken strictly in accordance with the Bureau of Indian Standards specification: IS 14534: 1998 entitled "The Guidelines for Recycling of Plastics".

7. Marking/codification: --

Manufacturers of recycled plastic carry bags having printing facilities shall code/mark carry bags and containers as per Bureau of Indian Standard Specification: IS 14534: 1998 entitled "The Guidelines for Recycling of Plastics" and the end product made out of recycled plastics shall be marked as "recycled" along with the indication of 1e percentage of use of recycled material. Other manufacturers, who do riot have printing facilities, shall comply with the condition within one year of publication of these rules. Manufacturers shall print on each packet of carry bags as to whether these are made of "recycled material" or of "virgin plastic".

8. Thickness of Carry bags: --

The minimum thickness of carry bags made of virgin plastics or recycled plastics shall not be less than 20 microns.

9. Self-regulation by certain persons: --

Without prejudice to the provisions contained in rule 3, the Plastics Industry Association, through their member units, shall undertake self-regulatory measures.

ANNEXURE III

GAZETTE OF INDIA - EXTRAORDINARY

PART II, SECTION 3, SUB-SECTION (II) PUBLISHED BY AUTHORITY NO. 540

New Delhi, Tuesday, June17, 2003

Ministry of Environment and Forests

NOTIFICATION

New Delhi, the 17th June, 2003

S.O. 698 (E).- Whereas certain draft rules to amend the Recycled Plastics Manufacture and Usage Rules, 1999 made by the Central Government in exercise of the powers conferred by clause (viii) of sub-section (2) of section 3 read section 25 of the Environment (Protection) Act, 1986 (29 of 1986) were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) vide S. O. 685 (E) dated the 1st July, 2002, inviting objections and suggestions from all persons likely to be affected thereby within a period of sixty days from the date of publication of the said draft;

And whereas copies of the Gazette containing the said draft rules were made available to the public 11th July, 2002;

And whereas objections and suggestions received within the aforesaid period have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by section 6 read with clause (viii) of sub-section (2) of section 3 and section 25 of Environment (Protection) Act 1986, (29 of 1986) the Central Government hereby makes the following rules to amend the Recycled Plastics Manufacture and Usage Rules, 1999, namely :-

1. (1) These rules may be called the Recycled Plastics Manufacture and Usage (Amendment) Rules, 2003.
   (2) They shall come into force on the date of their publication in the Official Gazette.
2. In the Recycled Plastics Manufacture, and Usage Rules, 1999, (herein after referred to as the said rules), in rule 1, for sub-rule (1), the following sub-rule shall be substituted, namely :-

   "(1)These rules may be called the Plastics Manufacture, Sale and Usage Rules, 1999."
3. For rule 2 of the said rules, the following rules shall be substituted, namely:-

   "2. **Application**.– The provisions of rules 4 and 8 shall not apply to the manufacture of carry bags exclusively for export purpose, against an order for export received by the owner or occupier of the concerned manufacturing unit;

   3. Definitions – In these rules, unless the context otherwise requires, -

      (a) "Act" means the Environment (Protection) Act, 1986 (29 of 1986);

      (b) "carry bags" means plastic bags which have a self carrying feature commonly known as vest type bags or any other feature used to carry commodities such as "D" punched bags; as illustrated in the Annexure to these rules;

      (c) "commodities" includes articles such as vegetables, fruits, pharmaceuticals and the like;

(d) "container" means flexible or rigid containers made of virgin plastics or recycled plastics with or without lid used to store, carry or dispense commodities;

(e) "food-stuffs" means ready to eat food articles and food products, fast food, processed or cooked food in liquid, powder, solid or semi-solid form;

(f) "registration" means registration of units manufacturing carry-bags and containers made of virgin or recycled plastics with the concerned State Pollution Control Board or Pollution Control Committee as the case may be;

(g) "vendor" means a person who sells food stuffs packed or stored in plastic carry bags or containers.".

4. For rule 4 of the said rules, the following rule shall be substituted, namely: -

"4. Restriction on manufacture, sale, distribution and use of virgin and recycled plastic carry bags and recycled plastic containers. -

(1) No person shall manufacture, stock, distribute or sell carry bags made of virgin or recycled plastic bags which are less than 8 x 12 inches {20 x 30 cms} in size and which do not conform to the minimum thickness specified in rule 8.

(2) No vendor shall use carry bags made of recycled plastic for storing, carrying, dispensing or packaging of foodstuffs.

(3) No vendor shall use containers made of recycled plastics for storing, carrying, dispensing or packaging of foodstuffs"

Explanation. - For the purposes of this rule, the minimum weight of 50 carry bags made of virgin or recycled plastics shall be 105 gms. plus or minus 5% variation and the carry bags of larger sizes shall be of proportionate increase in weight"

5. In rule 7 of the said rules, for the opening words "Manufacturers of", the words and figures "Subject to the provision of rule 4 and 5, manufacturers of " shall be substituted.

6. After rule 9 of the said rules, the following rule, annexure and forms shall be added, namely:-

"10. Grant of Registration for Manufactures –

(1) Every occupier manufacturing carry bags or containers of virgin plastic or recycled plastic or both shall make an application in Form 1 appended to these rules to the State Pollution Control Board or Pollution Control Committee of the union territory concerned for grant of registration or renewal of registration for his unit within four months from the date of publication of the Recycled Plastics Manufacture and Usage (Amendments) Rules 2003 in the official gazette.

(2) On or after the commencement of the Recycled Plastics Manufacture and Usage (Amendments) Rules 2003, no person shall manufacture carry bags or containers irrespective of its size or weight unless the occupier of the unit has registered the unit with the State Pollution Control Board/ Pollution Control Committee prior to the commencement of production;

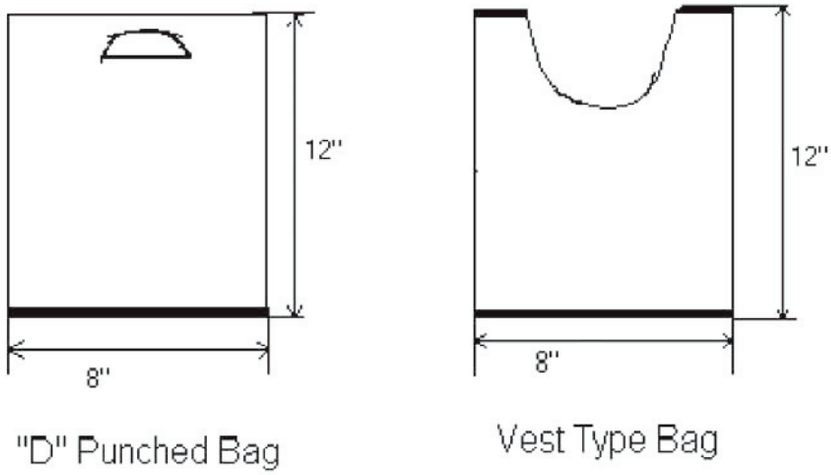
(3) The State Pollution Control Board or Pollution Control Committee shall not issue and renew a registration certificate of a unit unless that unit meets the norms prescribed under rules 5,6,7 and 8 of these rules and also possess a valid consent under the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) as per the requirements laid down by the State Pollution Control Board or Pollution Control Committee.

(4) Every State Pollution Control Board or State Pollution Control Committee shall grant registration within thirty days of receipt of application complete in all respects.

(5) The registration granted under this rule shall, unless revoked suspended or cancelled earlier, be valid for a period of three years.

(6) Every application for renewal of registration shall be made in the Form 1 appended to these rules at least sixty days before the expiry of the validity of registration

ANNEXURE [See rule 2 (b)]
Shape of bags



FORM - I

[*See* rules 10(1) and 10(4)]

APPLICATION FOR REGISTRATION OF A UNIT FOR MANUFACTURE OF PLASTIC CARRY BAGS AND CONTAINERS

From: .....
……
…….(Name and full address of the occupier)

To

The Member Secretary,
.....……. Pollution Control Board/Pollution Control Committee
…….
…….
Sir,

I/We hereby apply for registration under rule 10 of the Plastics Manufacture, Sale and Usage Rules, 1999.

PART – A GENERAL		
1. (a)	Name of the unit and location of activity	
(b)	Address of the unit	
(c)	Registration required for manufacturing of : (i) Carry bag virgin (ii) Carry bag recycled (iii) Containers virgin (iv) Container recycled	
(d)	Manufacturing capacity	
(e)	In case of renewal of Registration previous Registration number and date	
2. (a)	Is the unit registered with DCSSI or Department of Industries of the State Government/Union Territory Administration?	
(b)	If yes, attach a copy.	
3. (a)	Total capital invested on the project	
(b)	Year of commencement of production	
4 (a)	List and quantum of products and by-products	
(b)	List and quantum of raw materials used	
5	Furnish a flow diagram of manufacturing process showing input and output in terms of products and waste generated including for captive power generation and de-mineralized water	
6	Minimum sizes of carry bags to be manufactured. (in any case it should not be less than 8” x 12”)	
7.	Status of compliance with rules 5,6,7 and 8	

PART – B PERTAINING TO LIQUID EFFLUENT AND GASEOUS EMISSIONS			
8.	(a) Does the unit have a valid consent under the Water (Prevention and control of Pollution) Act, 1974 (6 of 1974) If yes, attach a copy		
	(b) Does the unit have a valid consent under the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) If yes, attach a copy		
PART – C PERTAINING TO WASTE			
9.	Solid Wastes: Total quantum of generation Mode of storage within the plant Provision made for disposal		
Place Signature Date :			Designation

FORM II

[*See* rule 10(3)]

CERTIFICATE OF REGISTRATION FOR THE MANUFACTURE OF PLASTIC CARRY BAGS AND CONTAINERS

File No. :…….
Dated:……..

To

Ref: Your application No…… dated…….seeking registration for manufacturing of carry bags and containers

The ……State Pollution Control Board or Pollution Control Committee after examining the application, hereby certifies that……. (Name & Address of the Unit) has been registered as a unit manufacturing ……

This certificate of registration shall be valid for a period of three years unless revoked or suspended.

The certificate is granted subject to the following conditions:

(i)
(ii)
(iii)
..
..

Date:
Place:

(Member Secretary)
State Pollution Control Board/
Pollution Control Committee

ANNEXURE IV

SPECIFICATIONS FOR TOOLS, EQUIPMENTS AND VEHICLES

Tricycle and push-cart

Sl. No.		Tricycle	Push-cart
1	Suitability	Suitable for door to door collection where more number of male worker available	Suitable for door to door collection where more number of Female worker available
2	Specification	Cycle Rickshaw with heavy duty 12 ply international Tyre with Tube, Hero make heavy duty Rim for front wheel, bullet rim Wheel with tyre of reputed make and tube in the rear side. Garbage box mounted on the rear wheel with box rectangular size of 4' X 3' X 2' with door. Outer frame covered with 18 G.C.R. sheet and inner side with 18G Aluminum Sheet (Heavy) and bottom side with ½" Country wood planks covered with 18G Aluminum sheet (Heavy) with one coat of Epoxy primer and one coat of Enamel Paint for Steel Portion.	Fiber glass buckets of 45 litres capacity each, body thickness over all 2.5 mm, bottom provided with + Type reinforcement with PVC Pipe 20 mm dia and two eye lids of 20 mm dia at the bottom. Bucket fitted with mild steel handle of 6 mm rod. Same is fitted to the buckets with rubber washer and bolt & nuts. At the point of fixing the handle the buckets shall have a thickness of not less than 12 mm and buckets shall have glossy double side finish coated with best quality of paint approved colour. At the side bottom 20 mm wide and 100 mm length fiber will be provided for easy lifting of the buckets. Bucket height 29" Top Dia 15" and Bottom 9" Chassis manufactured from 25 X 25 mm X 18 gauge thick mild steel Square pipe having 2 compartments of 350 mm X 350 mm clear dimension Front portion will be covered with Mild Steel sheet of 18 Gauge thick properly welded. The chassis is provided wit handle made out of Mild Steel round pipe of 30 mm dia X 16 Gauge thick. A handle will be fitted with rubber cap of length 300 mm long 2.5 mm thick. All other details as per the drawing.
3	Annual O & M cost	10% of capital cost	10% of capital cost
4	Entry tax	Does not arise	Does not arise
5	Registration	Does not arise	Does not arise
6	Training	Does not arise	Does not arise

SPECIFICATIONS FOR PUSH CARTS WITH 6 BINS FOR COLLECTION OF STREET SWEEPINGS AND DOOR-TO-DOOR COLLECTION OF SEGREGATED WASTE AND SEAMLESS CARTS FOR NALI DESILTING

SPECIFICATION OF SEAMLESS HAND CARTS FOR NALI DESILTING

The Hand carts (Wheel Barrows) should be heavy duty moulded in one tough iece by state of art "Injection Moulding process" manufactured using virgin grade of High Density polyethylene (HDPE) material confirming to the requirement of IS 10146-1982. Non-toxic, free from any contamination, chemical resistant, blended with stabilizers, anti-corrosive and anti-acidic, absolutely smooth and sanitary, free from joints, welds, provided with two ergonomic handles and two heavy duty rubber wheels. The hand carts should satisfy the critical requirements of MSW Rules, 2000.

Dimensions of the cart

Volumetric capacity	:	120 litres	
Weight	:	11 to 11.5 kgs	
Overall Height	:	Should not be less than 935 mm	(Tolerance
Depth	:	560 mm	+/- 5%)
Width	:	480 mm	
Wheels	:	2 Nos of 200 mm diameter heavy duty rubber wheels.	
Axle	:	The Axle should have corrosion protection by electro galvanizing and chromatic process	
Colour	:	Green and White	
Durability	:	Reusable, washable, absolutely smooth and sanitary to satisfy the critical needs of MSW Rules, 2000.	
Painting & Lettering	:	Painting and Slogan writing as per directions of the departmental officers.	

SPECIFICATION OF PUSH CARTS WITH 6 BINS FOR COLLECTION OF STREET SWEEPINGS AND DOOR-TO-DOOR COLLECTION OF SEGREGATED WASTE

SPECIFICATIONS OF PUSH CART

The Pushcart should be of size 1200 mm x 800 mm x 360 mm with 6 Compartments for accommodating 6 Nos of Polyethylene bins of 30 litres capacity as per the following specifications:

- **Mainframe:** 25mm x 25mm x 5 mm MS angle in all directions.
- **Bottom:** 50mm x 25 mm x 5 mm M.S ' T 'section one number at the center longitudinally and two numbers laterally. 25 mm x 5 mm M.S flats longitudinally and laterally for resting the bins.
- **Top:** 50mm x 5 mm M.S flats one number longitudinally at the center and two numbers laterally.
- **Sides:** 25mm x 5 mm M.S flats 6 nos vertically and the front portion covered with M.S Sheet of 18 gauge thick welded properly.
- **Handle:** Handle of 30 mm dia M.S pipe of 16 gauge thickness fitted with the Pushcart by means of 25 mm x 25 mm x 5 mm M.S angle.
- **Wheels:** The Pushcarts should be fitted with two numbers of 25 mm dia single axle double bearing 410 mm dia x 50 mm width cast-iron rimmed solid rubber tyres. One number of front wheel with 200mm dia x 45 mm width cast-iron rimmed Solid rubber wheel.

- **Painting:** Painting with two coats of anticorrosive paint as per the specified colour and as per the directions of the departmental officers.

SPECIFICATIONS OF POLYETHYLENE CONTAINERS (30 LITRES CAPACITY) TO BE USED IN THE PUSHCART:

Item	:	Polyethylene Bins
Requirement	:	Bins to be used for Collection of Municipal Solid Waste and Street Sweepings
Overall Size	:	Top Size - 325 x 325 mm Bottom Size - 290 x 290 mm Overall height - 325 mm Four Holes on bottom side with 10 mm diameter Ribs on bottom side with 10 mm size should be provided for easy handling Handle: 8 mm diameter MS bar with MS strip of 1.6 mm thickness on both sides of handle with heavy duty suitable rivets Thickness: All side 3 mm except wall thickness (+/- 5%) Tolerances : +/- 3 mm except wall thickness Bottom should be 4 mm thick. Embossment :Name of the ULB on the sides of the Bins
Material	:	Special Grade of Polyethylene material absolutely Non-toxic, free from any Contamination and chemical reaction and UV stabilized Polymer to be used for moulding should be Virgin
Colour	:	White and Green as per directions of the department officers

MATERIAL TECHNICAL PARAMETER

Sl. No	Properties	Test Method	Unit	Specified Value
1.	Density	ASTMD 1505	gms/cc	> 0.930
2.	Melt flow rate	ASTMD 1238	gms/cc	> 0.42
3.	Tensile Strength at Yield	ASTMD 638	kg/cm2	>105
	Tensile Strength at Break		kg/cm2	>175
4.	Elongation at Yield		%	>20
	Elongation at Break		%	>800
5.	Resistance to Impact or Impact Strength	As per guidelines of IS 12701:1996(No sign of Cracking or puncture/ damage of the sample)		
6.	Flexural Modulus:	ASTMD 790	kg/cm2	>3500
7.	Vicat Softening Temperature	ASTMD 1525	o C	>117
8.	Tensile Strength	> 120 Kg/cm2 as per guidelines of IS 8543		
9.	Weathering	ASTMD 2565	Tensile and Flexural value should not be less than 70% of the original value after exposure	

10.	Process	Injection Moulding Process Air entrapment should be avoided

TIPPER AUTO (0.75 MT)

1	Suitability type of vehicle and market supplies	Suitable to collect the Garbage in the streets having less then 15' width.
2	Specification	An Auto with tipping arrangements having an open body with MS bottom and Aluminum sides of pay load capacity of Minimum 600 kg fitted with Diesel engine of capacity between 400CC to 510CC with out exceeding the 3500mm of turning radius including cost of chassis and cabins.
3	Usage for SWM	For the streets having less than 15' width tipping Auto (three wheelers) is useful. These tipping Auto may also be used for Door to Door collection.
4	DGS & D priced Vehicles	DGS & D rate is not available.
5	Response time for service	The Repairs & fault should be rectified with in 48 hours. The supplies should have AMC facilities for the Vehicle supplied by them and cost for AMC should also be considered.
6	Annual O&M cost	The comparative statements should be prepared on cost / Tonne/ Km basis considering (a) Annualized cost (c) man power cost, (d) Fuel (e) Maintenance (I @ 10% of capital cost) (f) Supervision cost (@ 10% of man power cost and the waste transported by the vehicle (b) $O \& M = \frac{a+c+d+e+f}{Bx350}$
7	Entry tax	The Entry tax should also taken into account for comparing the net cost of vehicle.
8	Rate to includes registration tax for the first time	The expenditure to be incurred to wards the registration should also be included to arrive the net cost of vehicle for comparison purpose.
9	Training to Drivers	The supplier should give training to the Drivers sponsored by the municipality to enable to operate the special type of vehicles, which requires experience to operate them.

SPECIFICATIONS FOR SMALLER TIPPERS

EQUIPMENT SPECIFICATION

The Smaller Tippers for congested lane and important areas should have the body specification of (1) Volumetric capacity - 1.8 m3, (2) Loading capacity - 630 Kgs, (3) Kerb weight - 560 Kgs, (3) Hoist -AGPL make 80 x 45 x 500 Hydraulic cylinder with scissor Mechanism, (4) Sub Frame - All welded construction of rectangular hollow section, reinforced adequately on the load members, mounted on chassis with nuts and bolts, (5) Power Pack -12 V DC HYVA Power pack unit with 15 Lits Oil tank, (6) Tipping angle – 60° (Flat floor), (7) Sliding angle – 370,(8) Overall dimensions of Container

– 2805 x 1345 x 820 mm, (9) Loading Height – 1600 mm, (10) Painting-Superstructure painted wit one coat of epoxy primer and two coats of enamel paint.

All the above arrangements firmly & safely mounted on a 1500-1600 Kgs GVW vehicle chassis (4 wheeler) fitted with 700 cc, 4 Stroke Diesel Engine with BS-II/BS-III norms, with a power of 16 HP @ 3200 rpm and a torque of 3.8 m kgf @ 2000 rpm, with loading capacity of 650 to 750 kgs. The vehicle chassis should have a 2000 to 2100 mm Wheel Base fitted with day cabin, 5 speed synchromesh gear box, having Disc brakes, Twin Mirror LH/RH (One each), tool kits with mechanical jack, CMVR kit spare wheel carrier and rim with 45R12 LT 8PR Nylon tyres. The cost of the above vehicle chassis should be covered under DGS&D rate contract price if available or Special Government price if available. Warranty and free services should be given as per vehicle manufacturer's recommendation.

BODY SPECIFICATION

- Volumetric capacity – 1.8 m^3
- Loading capacity – 630 Kgs
- Kerb weight – 560 Kgs
- Hoist - AGPL make 80 x 45 x 500 Hydraulic cylinder with scissor Mechanism
- Sub Frame -All welded construction of rectangular hollow section, reinforced adequately on the load members, mounted on chassis with nuts and bolts.
- Power Pack – 12 V DC HYVA Power pack unit with 15 Lits Oil tank.
- Tipping angle – 60° (Flat floor)
- Sliding angle – 37^0
- Overall dimensions of Container – 2805 x 1345 x 820 mm
- Loading Height – 1600 mm
- Painting - Superstructure painted wit one coat of epoxy primer and two coats of enamel paint

SPECIFICATIONS FOR VEHICLE MOUNTED SKIP LIFTER EQUIPMENT AND 5 M^3 CAPACITY SKIP LIFTER CONTAINERS

EQUIPMENT SPECIFICATION

The Vehicle Mounted Skip Lifter Equipment should have a platform using 125 x 65 ISMC and 200 x 75 ISMC sections and 3mm thick M.S.Plate to withstand heavy duty and load conditions with two sloping stabilizers operating in high pressure hydraulic system as per international norms for shortest overhang and adequate support for safe operations (for ground support to lift 5 - 12 m^3 Containers), proven and reputed make hydraulic components with high quality imported pump (Necessary backup letters of association from the respective pump manufacturers committing their support to the system manufacturer for their product including availability of spares should be furnished) and high quality imported DC valve with fabricated boom (using 5mm thick Mild steel Plate with suitable stiffener and reinforcement) having 90mm dia solid pin for both sides. The section of the Skip Lifter body should be machine press and folded for light weight and heavy strength, should be neat, sturdy and good aesthetic look.

All the above arrangements firmly & safely mounted on a 9 to 10 Ton Gross Vehicle Weight Medium Motor Vehicle chassis provided with a factory fitted side Power Take Off (for independently driving the hydraulic circuit). The 9 to 10 Ton GVW vehicle chassis should have a 3400 to 3800 mm Wheel Base fitted with day cabin, BS II Diesel Engine with 90 to 100 PS, 5 speed synchromesh gear box, having air brake only, RUDP, Twin Mirror LH/RH (One each), tool kit with mechanical jack, CMVR kit spare wheel carrier and rim with (3+4) 8.25 x 16-16PR PD Nylon tyres. The cost of the

above vehicle chassis should be covered under DGS&D rate contract price if available or Special Government price if available. Warranty and free services should be given as per vehicle manufacturer's recommendation.

BIN SPECIFICATION

The 5 m^3 capacity Skip Containers for Collection and transportation of debris should have a construction of pressed section using M.S.Sheets confirming to IS 2062. The containers should have suitable colour bins for lifting by skip lifters.

Dimensions of the Bin:

- Volumetric capacity : 5 m^3
- Length : 3300 mm
- Width : 1500 mm (Tolerance of +/- 5%)
- Height : 1100 mm

Panels:

- Bottom and side : 4.0 mm thick M.S.Sheet
- U support Frame : 4.0 mm thick M.S.Sheet
- Colour of Bins : As per directions of the departmental officers.
- Painting & Lettering : Painting and Slogan writing as per directions of the departmental officers.

2.00MT to 4.00MT Capacity(Mini Lorry)

1	Suitability type of vehicle and market supplies	Suitable to collect the Garbage's in the streets having 15' to 20' width.
2	Specification	Tipper lorry loading height more then 1380m with a payload varying between 2000kg to 4000kg / 4000 Kg to 6000 Kg with stainless steel closed body with diesel engine capacity varying between 324CC to 2956CC without exceeding the turning radius beyond 6.9m including cost of chaises and cabin.
3	Usage for SWM	Most of the street collection of Garbage may be done using this tipper lorry. Depending on the number of 15' to 20' width road and Quantity of garbage generated in that streets this tipper lorry may be used.
4	DGS & D priced Vehicles	DGS & D rate is available.
5	Service Centre	Should be locally Serviced
6	Response time for service	The Repairs & fault should be rectified with in 48 hours. The supplies should have AMC facilities for the Vehicle supplied by them and tariff for AMC should also considered.

7	Annual O&M cost	The comparative statements should be prepared on cost / Tonne/ Km basis considering (a) Annualized cost (c) man power cost, (d) Fuel (e) Maintenance (I @ 10% of capital cost) (f) Supervision cost (@ 10% of man power cost and the waste transported by the vehicle (b) $O \& M = \frac{a+c+d+e+f}{Bx350}$
8	Entry tax	The Entry tax should also taken into account for comparing the net cost of vehicle.
9	Rate to include first time registration tax	The expenditure to be incurred to wards the registration should also be included to arrive the net cost of vehicle for comparison purpose.
10	Training to Drivers	The supplier should give training to the Drivers recommended by the municipality to enable to operate the special type of vehicles which requires experience to operate them.

4 MT to 6 MT Capacity Tipper Lorry

1	Suitability type of vehicle and market supplies	Suitable for mounting the compactor.
2	Specification and type Designs of equipment	Heavy duty goods chassis to here 16 tons gross vehicle weight and 4470mm wheel basis fitted with diesel engine of suitable rating with standard accessories excluding the cabin but including driver seat, seat belt and extra power take off unit as required for hydraulic system of compactor.
3	Usage for SWM	As the Chassis is to be used to mount the hydraulic system this should be with more toughness.
4	DGS & D priced Vehicles	DGS & D rate is available only for standard pay load capacity Vehicles with out extra power take off unit. Hence special Prices Quoted by the supplies / Manufacturer may be taken for consideration on comparative basis.
5	Service Center	Should be easily Serviceable at local Service center .
6	Response time for service	Warranty period , free Service duration and AMC conditions charges Should be quoted by the supplier.
7	Annual Maintenance Contract / O&M cost	With the cost Price of Compactor Unit the cost of the chassis should also be included in calculating the O&M of Compactor.
8	Entry tax	Should be included in arriving cost Prices of entire Compactor unit.
9	Rate to include first time registration	Should be included in arriving the cost Price of chassis and cost Price of entire Compactor Unit.
10	Training to Drivers	The Supplier should give training to the Drivers.

DUMPER PLACER

1	Suitability type of vehicle And market supplies	Suitable for collecting garbage's at the collection points such as street corners, markets, bus stand slums, colonies by placing Dumper placer Bins
2	Specification and type Designs	Dumper placer having twin container placer body with two stabilizer, mounted over the chassis of capacity 6 tonne with 61 KN divert injection diesel engine full filling the 2000 emission norms with required load spring leaves for front & rear, load spring assembly, V Clamps centre bolt, spring clamps etc., confirming with standard accessories.
3	Usage for SWM	It should be useful to handle the garbage at market, slums, Hotels, office complex and reduces the requirement of vehicles for primary collection and in secondary collection.
4	DGS & D priced Vehicles	DGS & D Price is available.
5	Service Centre	Should be enable to complete the fault and repairs immediately in the local service centers
6	Response time for service	The supplies should provide AMC details for the vehicle supplied by them and the repairing work should able to complete with in 48 hours.
7	Annual O&M cost	The comparative statements should be prepared on cost / Tonne/ Km basis considering (a) Annualized cost (c) man power cost, (d) Fuel (e) Maintenance (I @ 10% of capital cost) (f) Supervision cost (@ 10% of man power cost and the waste transported by the vehicle (b) $O \& M = \frac{a+c+d+e+f}{Bx350}$
8	Entry tax	The Entry tax should also taken into account for comparing the net cost of vehicle.
9	Rate to include first time registration tax	The expenditure to be incurred to wards the registration should also be included to arrive the net cost of vehicle for comparison purpose.
10	Training to Drivers	The supplier should give training to the Drivers recommended by the municipality to enable to operate the special type of vehicles.

SPECIFICATIONS OF VEHICLE MOUNTED TWIN BIN DUMPER PLACER EQUIPMENT AND 2.5 M³ CAPACITY COLOURED GALVANIZED STEEL SHEET BINS

EQUIPMENT SPECIFICATION

The Vehicle Mounted Twin Bin Dumper placer equipment should have a platform using 125 x 65 ISMC and 200 x 75 ISMC sections and 3mm thick M.S.Plate with two stabilizers operating in high pressure hydraulic system (for ground support to lift 2.5 m^3 bins), with high quality imported pump (Necessary backup letters of association from the respective pump manufacturers committing their support to the system manufacturer for their product including availability of spares should be furnished) and high

quality imported DC valve with fabricated boom (using 5mm thick Mild steel Plate with suitable stiffener and reinforcement) having 90mm diameter solid pin for both sides. The section of the dumper placer body should be machine press and folded for light weight and heavy strength, should be neat, sturdy and good aesthetic look.

All the above arrangements firmly & safely mounted on a 9 to 10 Ton Gross Vehicle Weight Medium Motor Vehicle chassis provided with a factory fitted side Power Take Off (for independently driving the hydraulic circuit). The 9 to 10 Ton GVW vehicle chassis should have a 3400 to 3800 mm Wheel Base fitted with day cabin, BS II Diesel Engine with 90 to 100 PS, 5 speed synchromesh gear box, having air brake only, RUDP, Twin Mirror LH/RH (One each), tool kit with mechanical jack, CMVR kit spare wheel carrier and rim with (3+4) 8.25 x 16-16PR PD Nylon tyres. The cost of the above vehicle chassis should be covered under DGS&D rate contract price if available or Special Government price if available. Warranty and free services should be given as per vehicle manufacturer's recommendation.

BIN SPECIFICATION

The 2.5 m^3 capacity bins for garbage collection should be closed type hygienic and provided with specially designed bin cover. The bin construction shall be of pressed section using colour coated steel sheet and riveted construction (welding not accepted). Suitable collar pins should be provided for lifting by the Twin Bin dumper placer. The rear should be mounted on heavy duty hinges and provided with necessary door locking mechanism.

Dimensions:

- Volumetric capacity : 2.5 m^3
- Length : 1700 mm
- Width : 1320 mm (Tolerance +/- 5%)
- Height : 1280 mm

Panels:

- Bottom and side : 2.5 mm thick galvanized Steel Sheet
- Top cover & Lid : 1.0 mm thick galvanized steel sheet
- Hinged Door : 1.6 mm thick coloured galvanized steel sheet with SS hinges
- U support Frame : 3.0 mm thick galvanised steel sheet
- Painting & Lettering : Slogan writing as per directions of the Departmental officers.

COMPACTOR

1	Suitability type of vehicle and market supplies	Suitable for collecting garbage at the collection points such as street corners, markets, bus stand by placing compactor bins of 1100 Litres
2	Specification and type Designs of equipment	Compactor having hopper capacity of 2m3 and total capacity of 12m3 (9 ton pay load) with fully enclosed mild steel body, confirming with IS 1079/1062 in quality of plate thickness varying from 5mm to 10mm used for the body and having hydraulically operated rear end loader with bin litter mechanism, hydraulic cylinders direction control valves confirming the ISO 9002

3	Usage for SWM	The usage of compactor should reduce the number of trips and vehicle with the considerable compaction ratio in collection
4	DGS & D priced Vehicles	This is a special purpose equipment very recently being marketed for which DGS & D rate not available.
5	Service Centre	Should be enable to complete the fault and repairs immediately in the local service centers
6	Response time for service	The supplier should provide AMC details for the vehicle supplied by them the repairing work should able to complete with in 48 hours.
7	Annual O&M cost	The comparative statements should be prepared on cost / Tonne/ Km basis considering (a) Annualized cost (c) man power cost, (d) Fuel (e) Maintenance (I @ 10% of capital cost) (f) Supervision cost (@ 10% of man power cost and the waste transported by the vehicle (b) $O \& M = \frac{a+c+d+e+f}{Bx350}$
8	Entry tax	The Entry tax should also taken into account for comparing the net cost of vehicle
9	Rate to include first time registration tax	The expenditure to be incurred to wards the registration should also be included to arrive the net cost of vehicle for comparison purpose
10	Training to Drivers	The supplier should give training to the Drivers recommended by the municipality to enable to operate the special type of vehicles.

FRONT END LOADER & BACKHOE EXCAVATOR

1	Suitability type of vehicle and market supplies	Suitable for earth work Suitable for turning the garbage at the compost yard
2	Specification and type Designs of equipment	A front end loader with capacity of 1.00 cu.m. with dumping angle minimum 45 degree and excavator capacity 0.24 cu.m. with a swing of minimum 180 degree mounted over a diesel engine developing 72 HP @ 2200 rpm with hydraulic system having minimum pressure of 2000 and maximum of 3000 PSI with Turing radius of 4000-5750mm
3	Usage for SWM	Used for loading purpose at Transfer station Used for turning the garbage at compost yard
4	DGS & D priced Vehicles	DGS & D rate is available.
5	Service Center	Should be easily Serviceable at local Service center.
6	Response time for service	Warranty period , free Service duration and AMC conditions charges Should be quoted by the suppliers.

7	Annual Maintenance Contract / O&M cost	The comparative statements should be prepared on cost / Tonne/ Km basis considering (a) Annualized cost (c) man power cost, (d) Fuel (e) Maintenance (I @ 10% of capital cost) (f) Supervision cost (@ 10% of man power cost and the waste transported by the vehicle (b) O & M = a+c+d+e+f / Bx350
8	Entry tax	Should be included in arriving cost Prices of Front End Loader.
9	Rate to include first time registration	Should be included in arriving the cost Price of Front End Loader.
10	Training to Drivers	The Suppliers should give training to the Drivers for atleast 7 days.

THE PULVERIZER

Sl. No.		Pulverizer (Hammer Type)
1	Suitability	Suitable for minimizing the size of Garbage using chapping hammer and pulverizing blades
2	Technical Specification	Supply of Tractor mounted pulverizer of capacity of 50 HP to 60 HP with 40 nos. of hammers and 2 nos. of blades & counter blade to make the size of Garbage not more then 6" dia including the facility of Variable speed conveyor with an output of 5-8 cu.m./hr. The length, width, height should not exceed more than 3.5 m, 1.5m and 2 m respectively. The machine must be capable of shredding banana trunk, coconut tree leafs and other bio-degradable waste.
3	Usage of Solid waste Management	Plays major role in compost yard
4	DGS & D priced vehicle	Not available
5	Service Center	Should be enable to complete the fault and repairs immediately in the local centers. The Urban Local Bodies staff who is allotted to operate this machine may be trained up to rectify the fault then and there.
6	Response time for service	The supplier should provide AMC details for the machine supplied by them
7	Annual O&M Cost	The comparative statement should be prepared on cost per tonne per hour basis
8	Taxes	The Entry tax and other tax should be included in basic cast of machine to calculate O&M
9	Training	The supplier should give training to the operators recommended by Municipality

THE AERO TILLER

SNo.		Aero tiller
1	Suitability	Suitable for turning the Garbage in windrow arrangement in the Compost Yard
2	Technical Specification	Supply of self propelled Aero tiller with engine capacity of 70 to 80 HP (Diesel) to tilt the Garbage in the windrow size of 3 m x 1.5 m (width x height) with tilling capacity of 1400 m3 / hours. The Gearbox should be facilitate with 12 forward and 4 reverse. The 3 m length of drum size of 850 mm dia with 250 mm blade should be to drive on both side, up and down hydraulic during operations and also in idle. The tyre should be tubeless, self cleaning, High traction with size of 12.5/8 for front and 7.5/16 for rear
3	Usage of Solid waste Management	Plays major roll in Compost Yard in telling Garbage of generation
4	DGS & D priced vehicle	Not available
5	Service Center	Should be enable to complete the fault and repairs immediately in the local centers. The Urban Local Bodies staff who is allotted to operate this machine may be trained up to rectify the fault then and there.
6	Response time for service	The supplier should provide AMC details for the machine supplied by them
7	Annual O&M Cost	The comparative statement should be prepared on cost per tonne per hour basis
8	Taxes	The Entry tax and other tax should be included in basic cast of machine to calculate O&M
9	Training	The supplier should give training to the operators recommended by Municipality

SPECIFICATIONS FOR 10 LITRES CAPACITY POLYETHYLENE BINS AND 40 LITRES CAPACITY POLYETHYLENE LITTER BINS

The Bin should be one piece moulded, heavy duty waste bin of approximately 10 litres capacity made out of FDA approved virgin grades of polyethylene material manufactured from blow moulding/roto moulding process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, anti-corrosive, anti-acidic, non-toxic and free from joints, welds or rims provided with moulded projections and with moulded lids to prevent spreading of smell, Flies, mosquitoes etc., Green bins meant for storage of segregated bio-degradable waste at source and White bins meant for storage of segregated Non-biodegradable/Recyclable waste at source. The bins should satisfy the critical requirement of MSW Rules, 2000 as per the drawings enclosed.

Dimensions of the Bin:

Top diameter	:	242 mm	
Bottom diameter	:	212 mm	(Tolerance +/- 5%)

Height	:	340 mm
Volumetric capacity	:	10 litres
Design of Bin	:	Specially moulded projection for extra strength. High impact strength, rough and tough.Twist type lockable lid. Round in shape without sharp corners or welds. Moulded built-in bottom grip (2 Nos) for easy lifting of bin and unloading of waste.
Lid	:	Fully openable
Colour	:	Green/White
Durability	:	Reusable, washable, absolutely smooth and sanitary to satisfy the critical needs of MSW Rules, 2000. 100% rust free and maintenance free.
Painting & Lettering	:	As per directions of the departmental officers.

SPECIFICATIONS FOR 10 LITRES CAPACITY POLYETHYLENE BINS AND 40 LITRES CAPACITY POLYETHYLENE LITTER BINS

The Bin should be one piece moulded, heavy duty waste bin of approximately 10 litres capacity made out of FDA approved virgin grades of polyethylene material manufactured from blow moulding/roto process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, anti-corrosive, anti-acidic, non-toxic and free from joints, welds or rims provided with moulded projections and with moulded lids to prevent spreading of smell, Flies, mosquitoes etc., Green bins meant for storage of segregated bio-degradable waste at source and White bins meant for storage of segregated Non-biodegradable/Recyclable waste at source. The bins should satisfy the critical requirement of MSW Rules, 2000 as per the drawings enclosed.

Dimensions of the Bin:

Top diameter	:	242 mm
Bottom diameter	:	212 mm (Tolerance +/- 5%)
Height	:	340 mm
Volumetric capacity	:	10 litres
Design of Bin	:	Specially moulded projection for extra strength. High impact strength, rough and tough. Twist type lockable lid. Round in shape without sharp corners or welds. Moulded built-in bottom grip (2 Nos) for easy lifting of bin and unloading of waste.
Lid	:	Fully openable
Colour	:	Green/White
Durability	:	Reusable, washable, absolutely smooth and sanitary to satisfy the critical needs of MSW Rules, 2000. 100% rust free and maintenance free.
Painting & Lettering	:	As per directions of the departmental officers.
Material	:	Virgin Grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04. Material should have more than 250 kg / cm^2 of Tensile strength (as per ASTM D638 and IZOD impact strength of not less than 25kg –cm/cm as per ASTM D256; the

ESCR as per ASTM D 1693 must be greater than >500 (T50 HR).

SPECIFICATION OF 40 LITRES CAPACITY POLYETHYLENE LITTER BINS

The Bin should be one piece moulded, heavy duty waste bin of approximately 40 litres capacity made out of FDA approved virgin grades of polyethylene material manufactured from blow moulding/roto moulding process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, anti-corrosive, anti-acidic, non-toxic and free from joints, welds or rims provided with moulded projections and with moulded lids to prevent spreading of smell, Flies, mosquitos etc., Green bins meant for storage of segregated bio-degradable waste at source and White bins meant for storage of segregated Non-biodegradable/Recyclable waste at source. The bins should satisfy the critical requirement of MSW Rules, 2000 as per the drawings enclosed.

Dimensions of the Bin:

Top diameter	:	415 mm
Bottom diameter	:	330 mm (Tolerance +/- 5%)
Height	:	445 mm
Volumetric capacity	:	40 Litres
Design of Bin	:	Specially moulded projection for extra strength. High impact strength, rough and tough. Twist type lockable lid. Designed without sharp corners or welds. Light weight and easy to handle. Hygenic and easy to clean.
Lid	:	Fully openable
Colour	:	Green/White
Durability	:	Reusable, washable, absolutely smooth and sanitary to satisfy the critical needs of MSW Rules, 2000. 100% rust free and maintenance free.
Painting & Lettering	:	As per directions of the departmental officers.
Material	:	Virgin Grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04. Material should have more than 250 kg / cm^2 of Tensile strength (as per ASTM D638 and IZOD impact strength of not less than 25kg –cm/cm as per ASTM D256; the ESCR as per ASTM D 1693 must be greater than >500 (T50 HR).

SPECIFICATIONS FOR VEHICLE MOUNTED SKIP LIFTER EQUIPMENT AND 5 M^3 CAPACITY SKIP LIFTER CONTAINERS

EQUIPMENT SPECIFICATION

The Vehicle Mounted Skip Lifter Equipment should have a platform using 125 x 65 ISMC and 200 x 75 ISMC sections and 3mm thick M.S.Plate to withstand heavy duty and load conditions with two sloping stabilizers operating in high pressure hydraulic system as per international norms for shortest overhang and adequate support for safe operations (for ground support to lift 5 - 12 m^3 Containers), proven and reputed make hydraulic components with high quality imported pump (Necessary backup letters of association from the respective pump manufacturers committing their support to the system

manufacturer for their product including availability of spares should be furnished) and high quality imported DC valve with fabricated boom (using 5mm thick Mild steel Plate with suitable stiffener and reinforcement) having 90mm dia solid pin for both sides. The section of the Skip Lifter body should be machine press and folded for light weight and heavy strength, should be neat, sturdy and good aesthetic look.All the above arrangements firmly & safely mounted on a 9000 – 9500 Kgs Gross Vehicle Weight Medium Motor Vehicle chassis provided with a factory fitted side Power Take Off (for independently driving the hydraulic circuit). The vehicle chassis should have a 3400/3600 mm Wheel Base fitted with day cabin, BS II Diesel Engine with 90 PS, 5 speed synchromesh gear box, having air brake only, RUDP, Twin Mirror LH/RH (One each), tool kit with mechanical jack, CMVR kit spare wheel carrier and rim with (3+4) 8.25 x 16-16PR PD Nylon tyres with necessary after sales and warranty.

BIN SPECIFICATION

The 5 m^3 capacity Skip Containers for Collection and transportation of debris should have a construction of pressed section using M.S.Sheets confirming to IS 2062. The containers should have suitable colour bins for lifting by skip lifters.

Dimensions of the Bin:

- Volumetric capacity : 5 m^3
- Length : 3300 mm
- Width : 1500 mm (Tolerance of +/- 5%)
- Height : 1100 mm

Panels:

- Bottom and side : 4.0 mm thick M.S.Sheet
- U support Frame : 4.0 mm thick M.S.Sheet
- Colour of Bins : As per directions of the departmental officers.
- Painting & Lettering : As per directions of departmental officers

SPECIFICATIONS FOR PUSH CARTS WITH 6 BINS FOR COLLECTION OF STREET SWEEPINGS AND DOOR-TO-DOOR COLLECTION OF SEGREGATED WASTE AND SEAMLESS CARTS FOR NALI DESILTING.

SPECIFICATION OF SEAMLESS HAND CARTS FOR DRAIN DESILTING

The Hand carts (Wheel Barrows) should be heavy duty moulded in one tough piece by state of art "Rotational Moulding process" manufactured using virgin grade of Linear Low Density polyethylene (LLDPE) material confirming to the requirement of IS 10146-1982. Non-toxic, free from any contamination, chemical resistant, blended with stabilizers, anti-corrosive and anti-acidic, absolutely smooth and sanitary, free from joints, welds, provided with two ergonomic handles and two heavy duty HMHDPE wheels. The hand carts should satisfy the critical requirements of MSW Rules, 2000 as per the drawings enclosed.

Dimensions of the cart:

Volumetric capacity	:	120 litres
Weight	:	8 to 8.5 kgs
Overall Height	:	Should not be less than 800 mm
Depth	;	430 mm (Inside) (Tolerance +/- 5%)
Width	:	430 mm (Inside)

Wheels	:	2 Nos of 200 mm diameter heavy duty HMHDPE wheels.
Axle	:	The Axle should have corrosion protection by electro galvanizing and chromatic process
Colour	:	Green /White
Durability	:	Reusable, washable, absolutely smooth and sanitary to satisfy the critical needs of MSW Rules, 2000.
Painting & Lettering	:	As per directions of the departmental officers.

SPECIFICATION OF PUSH CARTS WITH 6 BINS FOR COLLECTION OF STREET SWEEPINGS AND DOOR-TO-DOOR COLLECTION OF SEGREGATED WASTE

SPECIFICATION OF PUSH CART

The Pushcart of size 1200 mm x 800 mm x 360 mm with 6 Compartments for accommodating 6 Nos of Polyethylene bins of 45 litres capacity as per the following specifications:

- **Main frame:** 25mm x 25mm x 5 mm MS angle in all directions.
- **Bottom:** 50mm x 25 mm x 5 mm M.S ‘ T ‘section one number at the center longitudinally and two numbers laterally. 25 mm x 5 mm M.S flats longitudinally and laterally for resting the bins.
- **Top:** 50mm x 5 mm M.S flats one number longitudinally at the center and two numbers laterally.
- **Sides:** 25mm x 5 mm M.S flats 6 nos vertically and the front portion covered with M.S sheet of 18 gauge thick welded properly.
- **Handle:** Handle of 30 mm dia M.S pipe of 16 gauge thickness fitted with the Pushcart by means of 25 mm x 25 mm x 5 mm M.S angle.
- **Wheels:** The Pushcarts should be fitted with two numbers of 25 mm dia single axle double bearing 410 mm dia x 50 mm width cast-iron rimmed solid rubber tyres. One number of front wheel with 200mm dia x 45 mm width cast-iron rimmed Solid rubber wheel.
- **Painting:** Painting with two coats of anticorrosive paint as per the required colour and as per the directions of the departmental officers.

SPECIFICATIONS OF 45 LITRES CAPACITY POLYETHYLENE BIN

The polyethylene container having size of 325 mm X 325 mm at the top and 290 mm X 290 mm at bottom with overall height of 450 mm shall be designed for transferring solid waste to the communal waste storage sites. It shall be made from durable material. The moulded polyethylene container shall be made from one piece rotational moulding process. It shall have top-rim outside and embossment as per requirement. The bottom of container shall have four holes of 10 mm dia. It shall be drilled at the corners. Inbuilt suitable stiffener shall be provided in the bottom and 15 mm wide and 10 mm deep and suitable stiffener must be provided on both the side other than the handle fixed sides. Built-rim shall be provided at bottom for easy handling and tilting container. A handle shall be provided at top of container. The handle shall be made from 8 mm MS bar and both ends of handle shall be fitted with rivets by placing inside and outside MS strips. The fixing arrangement shall be such that it can hold handle firmly and easily so also tilting and lifting can be done.

TOLERANCES: 1 or 3 mm except wall thickness
THICKNESS: All side should be 3 mm thick and Bottom should be 4 mm thick.
Tolerances of + 5% will be allowed.

The material for the manufacture of moulded polyethylene garbage bins should be virgin grade of Linear Low Density Poly Ethylene (LLDPE) and of the best quality. The material should also conform to the Indian standards.

SPECIFICATIONS FOR SMALLER TIPPERS

EQUIPMENT SPECIFICATION

The Smaller Tippers for congested lane and important areas should have the body specification of (1) Volumetric capacity - 1.8 m3, (2) Loading capacity - 630 Kgs, (3) Kerb weight - 560 Kgs, (3) Hoist -AGPL make 80 x 45 x 500 Hydraulic cylinder with scissor Mechanism, (4) Sub Frame - All welded construction of rectangular hollow section, reinforced adequately on the load members, mounted on chassis with nuts and bolts, (5) Power Pack -12 V DC HYVA Power pack unit with 15 Lits Oil tank, (6) Tipping angle – 60o (Flat floor), (7) Sliding angle – 370,(8) Overall dimensions of Container – 2805 x 1345 x 820 mm, (9) Loading Height – 1600 mm, (10) Painting-Superstructure painted wit one coat of epoxy primer and two coats of enamel paint. All the above arrangements firmly & safely mounted on a 1500-1600 Kgs GVW LMV chassis (4 wheeler) fitted with 700 cc, 4 Stroke Diesel Engine with BS II/BS III norm, with a power of 16 HP @ 3200 rpm and a torque of 3.8 m kgf @ 2000 rpm, with loading capacity of 750 kgs. The vehicle chassis should have a 2000/2100 mm Wheel Base fitted with day cabin, 5 speed synchromesh gear box, having Disc brakes, Twin Mirror LH/RH (One each), tool kits with mechanical jack, CMVR kit spare wheel carrier and rim with 145R12 LT 8PR Nylon tyres with necessary after sales and warranty.

BODY SPECIFICATION

- Volumetric capacity - 1.8 m^3
- Loading capacity - 630 Kgs
- Kerb weight - 560 Kgs
- Hoist - AGPL make 80 x 45 x 500 Hydraulic cylinder with scissor Mechanism

- Sub Frame-All welded construction of rectangular hollow section, reinforced adequately on the load members, mounted on chassis with nuts and bolts.
- Power Pack-12 V DC HYVA Power pack unit with 15 Lits Oil tank.
- Tipping angle – 60° (Flat floor)
- Sliding angle – 37^0
- Overall dimensions of Container – 2805 x 1345 x 820 mm
- Loading Height – 1600 mm
- Painting - Superstructure painted wit one coat of epoxy primer and two coats of enamel paint

SPECIFICATIONS OF VEHICLE MOUNTED TWIN BIN DUMPER PLACER EQUIPMENT AND 2.5 M^3 CAPACITY COLOURED GALVANIZED STEEL SHEET BINS

EQUIPMENT SPECIFICATION

The Vehicle Mounted Twin Bin Dumper placer equipment should have a platform using 125 x 65 ISMC and 200 x 75 ISMC sections and 3mm thick M.S.Plate with two stabilizers operating in high pressure hydraulic system (for ground support to lift 2.5 m^3 bins), with high quality imported pump (Necessary backup letters of association from the respective pump manufacturers committing their support to the system manufacturer for their product including availability of spares should be furnished) and high quality imported DC valve with fabricated boom (using 5mm thick Mild steel Plate with suitable stiffener and reinforcement) having 90mm diameter solid pin for both sides. The section of the dumper placer body should be machine press and folded for light weight and heavy strength, should be neat, sturdy and good aesthetic look .All the above arrangements firmly & safely mounted

on a 9 Ton /10 Ton Gross Vehicle Weight Medium Motor Vehicle chassis provided with a factory fitted side Power Take Off (for independently driving the hydraulic circuit). The 9 Ton /10 Ton GVW vehicle chassis should have a 3400/3600 mm Wheel Base fitted with day cabin, BS II Diesel Engine, 5 speed synchromesh gear box, having air brake only, RUDP, Twin Mirror LH/RH (One each), tool kit with mechanical jack, CMVR kit spare wheel carrier and rim with (3+4) 8.25 x 16-16PR PD Nylon tyres with necessary after sales and warranty.

BIN SPECIFICATION

The 2.5 m^3 capacity bins for garbage collection should be closed type hygienic and provided with specially designed bin cover. The bin construction shall be of pressed section using colour coated steel sheet and riveted construction (welding not accepted). Suitable collar pins should be provided for lifting by the Twin Bin dumper placer. The rear should be mounted on heavy duty hinges and provided with necessary door locking mechanism.

Dimensions:

- Volumetric capacity : 2.5 m^3
- Length : 1700 mm
- Width : 1320 mm](Tolerance +/- 5%)
- Height : 1280 mm

Panels:

- Bottom and side - 2.5 mm thick powdered coated galvanized steel Sheet
- Top cover & Lid - 1.0 mm thick coloured galvanized steel sheet with SS hinges
- Hinged Door - 1.6 mm thick coloured galvanized steel sheet with SS hinges
- U support Frame - 3.0 mm thick powder coated stainless steel
- Rivets - Lock Bolt rivets
- Colour of Bins - Green/White/Black
- Painting & Lettering - As per directions of departmental officers

SPECIFICATION FOR DUMPER PLACER CONTAINER

(I)FRP CONTAINER

Supply of container for Dumper Placer with 2.5 m^3 / 3 m^3 capacity of Fiber reinforced plastic container with minimum shell thickness of 5mm including necessary lid, handle, hooking provision etc., complete.

(II) GI / MS CONTAINER

Supply of container for Dumper Placer with required capacity of 2.5 m^3 / 3 m^3 with minimum shell thickness of 2.54 mm using special type of material such as GI / MS shall with two coats of rust proof special grade painting in the out side of container, and with sand blasting or synthetic fiber sheet lining provision in the inside container with necessary lid, handle, hooking provision etc., complete.

(III) STAINLESS STEEL

Supply of container of Dumper Placer of required capacity of 6 m^3 / 12 m^3 / 30m^3 using stainless steel sheet of minimum thickness of 2.5 mm with outer lining of synthetic fiber sheet etc., with necessary lid, handle, hooking, provision etc., complete.

SPECIFICATION FOR GARBAGE COLLECTION CONTAINERS LLDPE/ HDPE CONTAINER

Supply of Garbage collection bins with various capacity moulded LLDPE / HDPE material of thickness of minimum 5 mm with necessary lid, handle and hooking, wheeling provision etc complete.

TECHNICAL SPECIFICATIONS OF HOUSE HOLD WASTE BIN

General Specifications:

One Piece Moulded, Heavy Duty Waste Bin of approx. 5 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Blow Moulding/roto moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and from joints, welds or rims. Provided with moulded projections and provided with moulded Lid to prevent spread of smell, mosquitoes etc. meant for segregation of waste at source in Bio-degradable and Recylable waste in Green and Blue colour ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 2000.

Basic Qualities:

- Moulded from Special UV Stabilized grades of Polyethy lene.
- Round in Shape without sharp corners to prevent sticking of Garbage.
- Must be designed for segregation and storage of Garbage at House Hold.
- 100 % Rust Free and Maintenance free.
- Colourful and Elegant.
- Light Weight and Easy to handle.
- Hygienic and Easy to clean
- Strong and Durable

Detail Specifications :

Application : Segregation for Storage and handling of Solid Waste at House Holds / offices / shops etc.

Capacity : 5 Litres.

Material : Virgin grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04.

Material should have more than 250 Kg/CM^2 of Tensile strength (as per ASTM D 638) and Izod impact strength of not less than 25 Kg-Cm/Cm as per ASTM D256; The ESCR as per ASTM D 1693 must be greater than > 500 (T50 HR).

Dimensions:

Capacity	Overall Dimensions (MM)		
Litres	Top Dia	Bottom Dia	Height
40	415 mm	330 mm	445 mm

(+/- 5 %)

Design : Specially moulded projections for extra strength High Impact strength; Rough & Tough. Twist type lockable Lid. User friendly design without sharp corners or welds.

		Moulded, Built-in Bottom Grip (2 Nos.) for easy lifting of bin and unloading of waste.
Lid	:	Fully openable (or as specified by user)
Colour	:	Blue / Green
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Printing	:	Shall be printed as per client's requirement.

Technical Specifications of Waste Bin

General Specifications:

One Piece Moulded, Heavy Duty Waste Bin of approx. 40 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Blow Moulding / roto moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and from joints, welds or rims; provided with 2 Nos. of built in flexible HDPE Handles on two sides. The lifting handles are moulded in one piece with Waste Bin for longer life. Provided with moulded Lid to prevent spread of smell, mosquitoes etc. ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 2000.

Basic Qualities

- Moulded from Special UV Stabilized grades of Polyethylene.
- Round in Shape without sharp corners to prevent sticking of Garbage.
- 100 % Rust Free and Maintenance free.
- Colourful and Elegant.
- Light Weight and Easy to handle.
- Hygienic and Easy to clean
- Strong and Durable

Detail Specifications :

Application	:	For Storage and handling of Solid Wastes and suitable for being lifted by hand & kept in the Push Cart/Tricycles.
Capacity	:	40 Litres.
Material	:	Virgin grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04.

Material should have more than 250 Kg/CM^2 of Tensile strength (as per ASTM D 638) and Izod impact strength of not less than 25 Kg-Cm/Cm as per ASTM D256; The ESCR as per ASTM D 1693 must be greater than > 500 (T50 HR).

Dimensions:

Capacity	Overall Dimensions (MM)		
Litres	Top Dia	Bottom Dia	Height
40	415 mm	330 mm	445 mm

(+/- 5 %)

Design	:	Specially moulded projections for extra strength High Impact strength; Rough & Tough. Twist type lockable Lid.

		User friendly design without sharp corners or welds. Moulded, Built-in Bottom Grip (2 Nos.) for easy lifting of bin and unloading of waste.
Lid	:	Fully openable (or as specified by user)
Colour	:	Blue / Green
Handle	:	HDPE Handles - Moulded in one tough piece # 2 Nos.
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Printing	:	Shall be printed as per client's requirement.

TECHNICAL SPECIFICATION OF DOOR TO DOOR COLLECTION EQUIPMENT

General Specifications:

Supply and delivery of Door to Door collection equipment an integrated equipment to fulfill the objective of transportation of segregated garbage from source and unloading of the same into secondary collection point without touching the garbage. The equipment allows the user to manually off-load the garbage by a simple mechanism without any stress. The equipment consists of Pedal Driven Cycle Rickshaw & one piece molded waste containers of 250 liters of 2 nos. conforming to IS 10146-1982. The Pedal Driven Cycle consist of premium quality chassis with rear frame fabricated out of MS angles and flats is designed to house two plastic containers of 250 liters capacity conforming to IS 10146-1982. Also a sturdy bar frame in the front, big hubs with sealed bearings, two standard hand breaks, two numbers of rear wheels and one front wheel with suitable mudguards and heavy duty tyres and tubes shall be provided. Axle capacity should be minimum 300 kgs. The entire try cycle should be painted with Red oxide primer as first coat and two coats of anticorrosive synthetic enamel paint to ensure long lasting structures. The Waste Container of 250 litres capacity made out of one piece moulded virgin grade of LLDPE material absolutely non –toxic, free from any contamination, chemical resistant conforming to IS 10146-1982. The containers should be provided with unique sliding doors capable of carrying minimum 256 kgs. of garbage and the container should be in Green & Blue colors for transporting the segregated garbage collected from source. The design of the container should be without sharp corners or welds and sloppy design to unable to 100% unloading of waste, absolutely smooth and sanitary to satisfy the critical needs of SWM. Printing on the container shall be provided as per the department's requirements.

Technical Specifications of Waste Bins[Round Type] –

General Specifications:

One Piece Moulded, Heavy Duty Waste Bin of approx. 80 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Rotational Moulding Process / Blow Moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and free from joints, welds or rims; provided with fully openable unique lid, open from either side for easy garbage drop even from distance, ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 2000.

Basic Qualities

- Moulded from Special UV Stabilized grades of Polyethylene.
- Rounded Corners to prevent sticking of Garbage.
- 100 % Rust Free and Maintenance free.
- Colourful and Elegant.
- Light Weight and Easy to handle.

- Hygienic and Easy to clean.
- Strong and Durable.

Detail Specifications:

Name	:	Waste Container
Application	:	For Storage and handling of Solid Wastes at roadsides, community areas and in municipal areas.
Capacity	:	Container of not less than 80 Litres capacity should adequately handle Solid Waste of at least 48 Kgs.
Material	:	Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982, Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic.
Dimensions	:	Top Should not be less than 460 mm. Bottom Should not be less than 360 mm Height Should not be less than 700 mm
Lid	:	Half round design without sharp corners, designed with two openings for easy garbage drop even from distance.
Colour	:	Blue and Green
Durability	:	The Bin is One Piece Moulded, Non Toxic, Strong and Sturdy, Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM 2000.
Printing	:	Shall be printed as per client's requirement.
Material	:	Virgin Grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04. Material should have more than 250 kg / cm^2 of Tensile strength (as per ASTM D638 and IZOD impact strength of not less than 25kg – cm / cm as per ASTM D256; the ESCR as per ASTM D 1693 must be greater than > 500 (T50 HR).

Technical Specifications of Waste Bins[Round Type]

General Specifications:

One Piece Moulded, Heavy Duty Waste Bin of approx. 100 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Rotational Moulding Process / Blow Moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and free from joints, welds or rims; provided with fully openable unique lid, open from either side for easy garbage drop even from distance, ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 2000.

Basic Qualities

- Moulded from Special UV Stabilized grades of Polyethylene.
- Rounded Corners to prevent sticking of Garbage.
- 100 % Rust Free and Maintenance free.
- Colourful and Elegant.

- Light Weight and Easy to handle.
- Hygienic and Easy to clean.
- Strong and Durable.

Detail Specifications:

Name	:	Waste Container
Application	:	For Storage and handling of Solid Wastes at roadsides, community areas and in municipal areas.
Capacity	:	Container of not less than 100 Litres capacity should adequately handle Solid Waste of at least 60 Kgs.
Material	:	Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982, Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic.
Dimensions	:	Top Should not be less than 500 mm. Bottom Should not be less than 420 mm Height Should not be less than 700 mm
Lid	:	Half round design without sharp corners, designed with two openings for easy garbage drop even from distance.
Colour	:	Blue and Green
Durability	:	The Bin is One Piece Moulded, Non Toxic, Strong and Sturdy, Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM 2000.
Printing	:	Shall be printed as per client's requirement.
Material	:	Virgin Grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04. Material should have more than 250 kg / cm^2 of Tensile strength (as per ASTM D638 and IZOD impact strength of not less than 25kg – cm / cm as per ASTM D256; the ESCR as per ASTM D 1693 must be greater than > 500 (T50 HR).

Technical Specifications of Waste Bins [Round Type]

General Specifications:

One Piece Moulded, Heavy Duty Waste Bin of approx. 120 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Rotational Moulding Process / Blow Moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and free from joints, welds or rims; provided with fully openable unique lid, open from either side for easy garbage drop even from distance, ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 2000.

Basic Qualities

- Moulded from Special UV Stabilized grades of Polyethylene.
- Rounded Corners to prevent sticking of Garbage.
- New Step design provided for extra strength.

- 100 % Rust Free and Maintenance free.
- Colourful and Elegant.
- Light Weight and Easy to handle.
- Hygienic and Easy to clean.
- Strong and Durable.
- Bottom Ribs for ease of handling.

Detail Specifications:

Name	:	Waste Container
Application	:	For Storage and handling of Solid Wastes at roadsides, community areas and in municipal areas.
Capacity	:	Container of not less than 120 Litres capacity should adequately handle Solid Waste of at least 60 Kgs.
Material	:	Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982, Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic.
Dimensions	:	Top should not be less than 490 mm (Outside) Bottom should not be less than 325 mm (Outside) Height should not be less than 800 mm (Tolerance +/- 5 %)
Lid	:	Half round design without sharp corners, designed with two openings for easy garbage drop even from distance.
Design	:	Unique step design provided on all four sides for extra strength. Bottom Ribs of not less than 20 mm width provided for ease of handling.
Colour	:	Blue and Green
Durability	:	The Bin is One Piece Moulded, Non Toxic, Strong and Sturdy, Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM 2000.
Printing	:	Shall be printed as per client's requirement.
Material	:	Virgin Grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04. Material should have more than 250 kg / cm^2 of Tensile strength (as per ASTM D638 and IZOD impact strength of not less than 25kg – cm / cm as per ASTM D256; the ESCR as per ASTM D 1693 must be greater than > 500 (T50 HR).

Technical Specification of Community Mobile Plastic Bin

General Specifications:

Community Bins are elegantly designed, one piece moulded Integrated community bins of 630 Litres capacity manufactured from special grades of Polyethylene material duly reinforced with Outer MS

Jacket for strength, compatible with any automated Refuse Collector provided with 4 Heavy Duty Wheels fabricated on M.S. Jacket and unique fully openable pilfer proof Covers in green & blue colours by state of the art Rotational Moulding process. The Integrated Community Bins has unique combination of MS + plastics for strength and corrosion free life; they are provided with Reflectors on four sides.

Basic Qualities

- Compatible with any Refuse Collector
- Pilfer proof Lid Design
- Ideal replacement of Skids
- Easily accessible as Compact design
- 100% hygienic & easy to clean
- Easy to use, handle & transport
- Virtually maintenance free
- One piece moulded and strong

Detail Specifications :

Application	:	For storage, handling and transfer Solid waste at Secondary point.
Capacity	:	630 Litres
Dimensions	:	(Container)

Overall Dimensions (MM)

Top	Bottom	Height
1237 x 778	1117 x 628	870 mm (Without Wheels)

Design	:	One piece Moulded
Lid	:	One piece; fully openable

Material Specifications:

Name	:	Special Grade of Polyethylene material, absolutely Non-toxic, free from any contamination, chemical resistant and UV stabilized as below :
Density	:	0.930 to 0.943 Gms. / CC as per guidelines of IS 7328 – 1992 (For Raw Material)
Melt Flow Rate	:	2 to 6 Gms / 10 Mins as per IS 2530 - 1963
Tensile Strength	:	? 120 Kg/Cm2 as per guidelines of IS 8543 (Part 4/ Section -1) 1984
Flexural Strength	:	> 3000 Kg/CM2 as per guidelines of IS 13360(Part 5/ Section -7) 1997
Resistance to Impact	:	As per guidelines of IS 12701 : 1996 (No sign of Cracking or puncture / damage of the Samples)
Colour Fastness	:	As per guidelines of IS 2454 : 1985
UV	:	Polyethylene is blended with 0.25% of UV Stabilizers.
Vicat Softening Temperature	:	1160 C as per guidelines of IS 13360 (Part 6/ Section – 1) 1999

Wheels :

Type	:	04 Nos. Swivel type Heavy Duty Wheels fabricated at bottom of MS structure as per below mentioned dimensional details Dia : 200 mm (+/- 5 mm) Width : 50 mm (+/- 5 mm) Material : Special Polymeric Material Drawing : Enclosed herewith
MS Structure :		
Design	:	Fabricated out of MS Flat and required accessories for additional protection to Bin and efficient operations during unloading of Garbage.
MS Flat	:	40 x 5 mm
Side Handles	:	Dia 20 mm. Rod fabricated on two sides.
Coating	:	Black Powder Coating of more than 30 Micron.
Colour	:	Blue / Green for Container and Lid
Durability	:	The Mobile bin is reinforced with MS Jacket which Makes it strong and sturdy
Locking	:	Locking arrangements can be optionally provided.
Printing	:	Shall be provided as per the requirement
Drawing	:	Enclosed herewith

Technical Specification of Community Mobile Plastic Bin

General Specifications:

Community Bins are elegantly designed, one piece moulded Integrated community bins of 1100 Litres capacity manufactured from special grades of Polyethylene material duly reinforced with Outer MS Jacket for strength, compatible with any automated Refuse Collector automatic compactor system provided with 4 Heavy Duty Wheels fabricated on M.S. Jacket and unique fully openable pilfer proof Twin Covers in green & blue colours by state of the art Rotational Moulding process. The Integrated Community Bins has unique combination of MS + plastics for strength and corrosion free life; they are provided with Reflectors on four sides.

Basic Qualities

- Compatible with any Refuse Collector
- Twin Lid Design
- Ideal replacement of Skids
- Easily accessible as Compact design
- 100% hygienic & easy to clean
- Easy to use, handle & transport
- Virtually maintenance free
- One piece moulded and strong

Detail Specifications :

Application : For storage, handling and transfer Solid waste at Secondary point.

Capacity	:	1100 Litres
Dimensions	:	(Container)

Overall Dimensions (MM)

Top	Bottom	Height
1450 x 1020	1334 x 874	950 mm (Without Wheels)

(+/- 5 mm)

Dimensions	:	(Lid)

Overall Dimensions (MM)

Length	Width	Height
703	995	115

(+/- 5 mm)

Special Feature	:	Both parts of Lid are fully openable
Container & Lid :		
Thickness	:	Overall Average 6 mm (+/- 1 mm)
Weight	:	Approx. 46 Kgs (+/- 1 Kg)
Colour	:	Green for Bio Degradable Waste
Blue for Non Bio Degradable Waste		
Drawing	:	Enclosed herewith

Material Specifications :

Name	:	Special Grade of Polyethylene material, absolutely Non-toxic, free from any contamination, chemical resistant and UV stabilized as below :
Density	:	0.932 to 0.943 Gms. / CC as per guidelines of IS 7328 – 1992 (For Raw Material)
Melt Flow	:	2 to 6 Gms / 10 Mins as per IS 2530 – 1963 Rate
Tensile Strength	:	? 120 Kg/Cm2 as per guidelines of IS 8543 (Part 4/ Section -1) 1984
Flexural Strength	:	> 3000 Kg/CM2 as per guidelines of IS 13360(Part 5/ Section -7) 1997
Resistance to Impact	:	As per guidelines of IS 12701 : 1996 (No sign of Cracking or puncture / damage of the Samples)
Colour	:	As per guidelines of IS 2454 : 1985
UV	:	Polyethylene is blended with 0.25% of UVStabilizers.
Vicat Softening Temperature	:	1160 C as per guidelines of IS13360(Part 6/ Section – 1) 1999
Wheels :		
Type	:	04 Nos. Swivel type Heavy Duty Wheels fabricated at bottom of MS structure as per below mentioned dimensional details.
Dia	:	200 mm (+/- 5 mm)
Width	:	50 mm (+/- 5 mm)
Material	:	Special Polymeric Material
Drawing	:	Enclosed herewith
MS Structure :		
Design	:	Fabricated out of MS Flat and required accessories for additional protection to Bin and efficient operations during unloading of Garbage.
MS Flat	:	50 x 6 mm
Side Handles	:	Dia 25 mm. Rod fabricated on two sides.
Weight	:	Approx. 50 Kgs.

Technical Specifications of Home Composting Unit.

General Specifications:

One Piece Moulded, Heavy Duty Composting Unit suitable for one family made out of Polyethylene material manufactured from Rotational Moulding Process / Blow Moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and from joints, welds or rims. The lifting handles (04 Nos.) are moulded in the Unit for longer life sturdy and ideal for Home Composting of Bio-Waste.

Basic Qualities

- Moulded from Special UV Stabilized grades of Polyethylene.
- 100 % Rust Free and Maintenance free.
- Light Weight and Easy to handle.
- Hygienic and Easy to clean.
- All plastics Unit, washable & reusable.
- Strong and Durable.
- Provided with 04 Studs at bottom.

Detail Specifications:

Application	:	For Composting of Bio waste and convert into organic manure with or without worms
Capacity	:	Suitable for one family (05 persons) for one month.
Material	:	Polyethylene material blended with stabilizers, Anti Corrosive and Anti Acidic.
Dimensions	:	Top Should not be less than 640 x 440 mm. Bottom Should not be less than 515 x 325 mm Height Should not be less than 370 mm
Design	:	Partition with design feature so that monthly composting cycle can be set. Partition to be of same material of Unit; fully integrated with Unit by welding process. The design of the partition will also enable free movement for the worms. 2 holes of 10 mm Dia provided at bottom for collection of Vermi Wash. 4 Nos. of Bottom Studs are provided at the bottom to prevent ants and other insects going inside the composting Unit. Bottom Studs (04 Nos.) to be welded and fabricated at the bottom of Unit to make it seamless. Plastics Mesh provided with frame of same material as of Unit with min. 5 mm thickness and have a plastic mesh fabricated in between, for longer life and aeration. The Unit is designed with Unique strengthening ribs, 3 Nos. each on the length side (Both Sides) for extra strength. 04 Nos. of Moulded, built-in Handle projections on 04 sides for ease of lifting and handling.

		Frame is of fully openable design and fabricated with 2 Nos. of Polyethylene Hinges to make it fully corrosion free. Arrangement to be made for collection of Vermi Wash from bottom; Also to be of corrosion free or of plastics.
Durability	:	The Composting Unit is specially designed to take care of the load of Bio waste. Home Composting Unit is one piece moulded, non toxic, strong nd sturdy, re-usable, washable absolutely smooth and sanitary ideal for composting applications both for Simple composting as well as Vermi Composting method.

Technical Specification of Heavy Duty Wheel Barrow:

General Specifications:

Heavy Duty Wheel Barrows are moulded in one tough piece by state of the art Rotational Moulding process manufactured from Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982; Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant, blended with stabilizers and free from joints, welds or rims, with Heavy duty M.S. Jacket (Structure) fabricated from M.S. Angles and Flats duly coated with proper Anti Corrosive powder coating; provided with two ergonomic handles and two Heavy Duty Rubber Wheels; designed specially for Urban areas to store and handle Raw Garbage to satisfy critical needs of Solid Waste Management.

Basic Qualities:

- Moulded from special UV Stabilized grades of Polythylene
- 100% Rust free and maintenance free.
- Safe in handling as No Corrosion, cracking, blistering etc.
- Colourful and Elegant.
- Light weight and easy to handle.
- Hygienic and Easy to clean.
- Strong and Durable.

Detail Specifications:

Application	:	Door to Door collection and transportation of segregated garbage from house holds / offices / shops etc.
Capacity	:	Waste Containers can carry minimum of 50 to 60 Kgs. of Garbage.
Material	:	Virgin grade of Polyethylene material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of IS 10146 – 1982.
Dimensions:		
Top	:	Should not be less than 700x600 mm. (Outside)
Bottom	:	Should not be less than 400x400 mm. (Outside)

Height	:	Should not be less than 350 mm. (Tolerance +/- 5 %)
Design	:	Specially Moulded Ribs on all sides for Strength Moulded rounded projections on sides User friendly design without sharp corners or welds. Ergonomic Handles
Wheels	:	Two No. of Strong & Sturdy Rubberized CI Wheels to resist heavy impact loads and move smooth on patchy Roads of approx. 12 " Dia ad 2" Width. (+/- 5%) Tolerance.
Colour	:	Blue / Green
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Printing	:	Shall be printed as per client's requirement.

TECHNICAL SPECIFICATION OF PUSHCART BIN

General Specifications:

Supply and delivery of Pushcart Bin of 50 liters capacity of size 410mm (Top Dia) x 330 mm (Bottom Dia) x 575mm (Height) (+5) made out of FDA approved one piece molded virgin grade of high molegular high density polyethylene (HMHDPE) material manufacture from Blow Moulding process absolutely non –toxic, free from any contamination smooth and sanitary chemical resistant, anti-corrosive and anti-acidic conforming to ASTM D -543-04. Material should have more than 250 kgs. /cm. sq. of tensile strength conforming to ASTM D -638 and impact strength of not less than 25 kg – cm/cm as per ASTM D 256 and the ESCR should be greater than 500. (T50 HR) as per ASTM D 1693. The bin should be provided with two nos. of built in flexible one piece molded lifting handles on two sides made out of HDPE of virgin grade. Also the bin should be provided with moulded built in bottom grip two nos. for easy lifting of bin and unloading of waste. The twist type of lockable lid with high impact strength and specially moulded projections for extra strength should be provided to prevent spread of smile, mosquitoes etc., ideal for storage and handling solid waste to satisfy the critical requirement of MSW Rules, 2000 made out one piece mould virgin grade HMHDPE conforming to ASTM D – 543-04. The raw material should be blended with special stabilizer for better UV stabilization. Printing shall be provided as per the department's requirements.

TECHNICAL SPECIFICATION OF PUSHCART BIN

General Specifications:

Supply and delivery of Pushcart Bin of 80 liters capacity of size (475mm -Top Dia x 370 mm -Bottom Dia x 770mm –Height [+5]) made out of FDA approved one piece molded virgin grade of high molecular high density polyethylene (HMHDPE) material manufacture from Blow Moulding process absolutely non –toxic, free from any contamination smooth and sanitary chemical resistant, anti-corrosive and anti-acidic conforming to ASTM D -543-04. Material should have more than 250 kgs. /cm. sq. of tensile strength conforming to ASTM D -638 and Izod impact strength of not less than 25 kg – cm/cm as per ASTM D 256 and the ESCR should be greater than 500. (T50 HR) as per ASTM D 1693. The bin should be provided with two nos. of built in flexible one piece molded lifting handles on two sides made out of HDPE of virgin grade. Also the bin should be provided with moulded built in bottom grip two nos. for easy lifting of bin and unloading of waste. The twist type lockable lid with high impact strength and specially moulded projections for extra strength should be provided to prevent spread of smile, mosquitoes etc., ideal for storage and handling solid waste satisfy the

critical requirement of MSW 2000 made out one piece moulded virgin grade HMHDPE conforming to ASTM D – 543-04. The raw material should be blended with special stabilizer for better UV stabilization. Printing shall be provided as per the department's requirements.

TECHNICAL SPECIFICATION OF TRICYCLE BIN

General Specifications:

Supply and delivery of Pushcart Bin of 80 liters capacity of size (475mm -Top Dia x 370 mm -Bottom Dia x 770mm –Height [+5]) made out of FDA approved one piece molded virgin grade of high molecular high density polyethylene (HMHDPE) material manufacture from Blow Moulding process absolutely non –toxic, free from any contamination smooth and sanitary chemical resistant, anti-corrosive and anti-acidic conforming to ASTM D -543-04. Material should have more than 250 kgs. /cm. sq. of tensile strength conforming to ASTM D -638 and Izod impact strength of not less than 25 kg – cm/cm as per ASTM D 256 and the ESCR should be greater than 500. (T50 HR) as per ASTM D 1693. The bin should be provided with two nos. of built in flexible one piece molded lifting handles on two sides made out of HDPE of virgin grade. Also the bin should be provided with moulded built in bottom grip two nos. for easy lifting of bin and unloading of waste. The twist type lockable lid with high impact strength and specially moulded projections for extra strength should be provided to prevent spread of smile, mosquitoes etc., ideal for storage and handling solid waste to satisfy the critical requirement of MSW Rules,2000 made out one piece mould virgin grade HMHDPE conforming to ASTM D – 543-04. The raw material should be blended with special stabilizer for better UV stabilization. Printing shall be provided as per the department's requirements.

TECHNICAL SPECIFICATION OF HEAVY DUTY WHEEL BARROW

General Specifications:

Supply and delivery of Heavy duty wheel barrows of size 700mm x 600mm (top) x 400mm (Bottom) x 350mm (Height) (+ 5mm) is made out of one piece moulded virgin grade polyethylene material manufactured by rotational molding process absolutely non-toxic free from any contamination chemical resistant, anti corrosive and anti acidic absolutely smooth and sanitary free from joints welds and rims conforming to IS 10146-1982. The Wheel Barrow should have specially moulded ribs and all sides and moulded round projection on sides. The Wheel Barrow should be provided with heavy duty MS jacket (Structure) fabricated from MS angles and flats dully coated with proper anti-corrosive powder coating. Also the barrow should be provided with two ergonomic handles. The wheel Barrow should also be provided with two nos. of strong and study rubberized CI wheels to resistant heavy impact loads and moves smooth and patchy roads of approximate size 12" dia x 2" width + 5% . The Wheel Barrow designed specially for semi urban and rural areas to store and handle raw garbage satisfy critical needs of SWM. Printing shall be provided as per the department's requirements.

TECHNICAL SPECIFICATION OF WHEELED WASTE BIN

General Specifications:

Supply and delivery of Wheeled Waste Bin of 90 liters capacity of size (550mm -Top x 485 mm -Bottom x 840mm –Height [+5]) made out of FDA approved one piece molded virgin grade of polyethylene material manufactured out of state up the art rotational moulding process absolutely non –toxic, free from any contamination smooth and sanitary chemical resistant, anti-corrosive and anti-acidic conforming to IS 10146-1982. The bin should be provided with two nos. wheels of size 200mm dia x 50mm Width +5mm made out of special polymeric material of approved grade. Also the bin should be provided with a moulded inbuilt handle for easy tilting and movement of bin. The bin should be provided with the one piece moulded lid made out of virgin grade polyethylene conforming

to IS 10146 – 1982 with a moulded knob. The bin should be ideal for road side collection storage and handling solid waste satisfy the critical requirement of MSW 2000 The raw material should be blended with special stabilizer for better UV stabilization. Printing shall be provided as per the department's requirements.

TECHNICAL SPECIFICATION OF WHEELED WASTE BIN

General Specifications:

Supply and delivery of Wheeled Waste Bin of 140 liters capacity of size (600mm -Top x 545 mm -Bottom x 920mm –Height [+5]) made out of FDA approved one piece molded virgin grade of polyethylene material manufactured out of state up the art rotational moulding process absolutely non –toxic, free from any contamination smooth and sanitary chemical resistant, anti-corrosive and anti-acidic conforming to IS 10146-1982. The bin should be provided with two nos. wheels of size 200mm dia x 50mm Width +5mm made out of special polymeric material of approved grade. Also the bin should be provided with a moulded in built handle for easy tilting and movement of bin. The bin should be provided with the one piece moulded lid made out of virgin grade polyethylene conforming to IS 10146 – 1982 with a moulded knob. The bin should be ideal for road side collection storage and handling solid waste satisfy the critical requirement of MSW 2000 The raw material should be blended with special stabilizer for better UV stabilization. Printing shall be provided as per the department's requirements.

ANNEXURE V

(Model Bid Documents)

Request for Qualification (RFQ) Document for Construction and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility in Madurai Corporation

National Competitive Bidding (NCB)
Issued on : --.---.-----

NCB No: #2

Issued By:

MADURAI CORPORATION
MADURAI
TAMIL NADU

CONTENTS

Part 1 – Request for Qualification (RfQ)

SECTION I.INSTRUCTIONS TO APPLICANTS

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Section I.Instructions to Applicants (ITA)

A.GENERAL

1. Scope of Application

1.1 The Madurai Municipal Corporation (hereinafter referred to as "MADURAI CORPORATION" or "Owner") which is responsible for Solid Waste Management in Madurai Corporation intends to implement a project comprising "Construction and Maintenance of an Integrated Municipal Solid Waste Processing and Disposal Facility for Madurai Corporation"by PPP basis covering the following:

a. Construction of a Facility for processing and disposal of Bio-degradable Waste through Aerobic Composting using suitable Equipment and Machinery, and Operation and Maintenance of the plant for the specified period of 20 years.

b. Construction & Development of Sanitary Landfill (hereinafter referred to as landfill or SLF) facility and its operation, maintenance, closure (periodical and progressive cell based) and post-closure monitoring (concurrent basis) for the period of 15-years.The landfill shall be capable of handling disposal of accumulated mixed waste at the existing disposal site at Avaniyapuram, Madurai and the incoming variable daily volume of MSW 2000 that is to be progressively segregated during the period of construction and operation of this sanitary landfill.

c. Construction and Maintenance of Auxiliary Facilities for the Integrated MSW Processing and Disposal Facility for the specified period.Auxiliary facilities at MSW Processing & Disposal Complex, Inspection yard, Monsoon Shed, Finished Compost Storage , Rain cover for landfill cell.Administration and utilities complex including HT electrical sub-station, Stores, Dispensary, Laboratory, Main Control Center, DG room, Vehicle Maintenance facility, Security office etc., for compost yard and Sanitary landfill complex etc.

d. Construction, Development, Operation, Maintenance, Monitoring and all other related facilities and activities should be in compliance and accordance with applicable environmental norms and MSW Handling Rules 2000 notified by the Ministry of Environment & Forests, Government of India and other applicable codes and standards, rules and regulations as laid down by the concerned authority (i.e., BIS, TNPCB etc.)

1.2 The conceptual and design details of the facilities and estimated cost are provided in Part 2 of the document.

1.3 The Owner envisages formation of a Special Purpose Vehicle/Company, which shall be incorporated pursuant to selection of the Successful Bidder and it is proposed to transfer the responsibility of investment of 30% of finalized project cost and 100% of O&M expenses which shall be performed on a DBOT basis.

1.4 MADURAI CORPORATION issues the Request for Qualification Document ("RfQ") to Applicants interested in bidding for the project described hereunder and more particularly explained in Part 2:

a. Design, Build, Operate and Transfer Project (DBOT)
b. The term of the concession is 20 years which includes Construction, Operation, Maintenance, Closure (for SLF) and Post-Closure Monitoring (for SLF) on a concurrent basis and renewable upon mutually agreed terms and conditions.
c. The Project comprises of facilities as mentioned in Sec.1.1 above.
d. Madurai Corporation shall supply and transport the collected solid waste generated within Corporation limits.
e. The Project should be capable of accepting the generated volume at all times/stages of operation.
f. The Project should meet all environmental norms set forth in the applicable laws and rules, including but not necessarily limited to, the MSW Handling Rules 2000, as amended from time-to-time and guidelines issued by the Ministry of Environment & Forests, Government of India and other concerned Government Authorities.
g. Land will be provided to the Successful Bidder as per terms specified in Section V.
h. Components of the project are as outlined in Section 1 (1.1).
i. The transported MSW will be processed and/or disposed off (as specified herein and as allowed under applicable rules) by the successful bidder.The products generated from processing plant such as compost and any other by-product or end-product shall be utilized/sold by the successful Bidder at its own cost in compliance with the applicable rules and regulations.No payment shall be made to the Successful Bidder other than the aforementioned capital investment grant portion.
j. All inerts and/or processing rejects (in compliance with MSW Rules 2000 and other applicable laws) will be landfilled by the successful Bidder at the proposed Sanitary Landfill(s).

1.5 The conceptual and design details of the facilities and estimated cost are provided in Part 2 of the document.The scope of work and other related details corresponding to the Project subject of this Prequalification are also provided in the Part 2 and PDS.

2. Source of Funds 2.1 The Project shall be implemented on a PPP Basis.Part of the project capital cost (to the maximum of 70% of estimated project cost), may be available as Grant and the selected developer shall be required to arrange balance funding for the Project.The qualified Bidders may be required to submit their proposals along with in-principal commitment from financial institutions/banks for debt lending to the Project at the Request for Proposal (RFP) stage.

3. Eligible Applicants

3.1 An Applicant shall be a private, or public legal entity, or any combination of them in the form of association(s) including Joint Venture (JV) as evidenced by a suitable Memorandum of Understanding or Agreement.In the case of a JV, unless otherwise specified in the PDS, (i) all parties shall be jointly and severally liable, and (ii) the number of partners shall be limited as per PDS.

3.2 The eligibility criteria listed in this Clause 3 shall apply to the Applicant, including the parties constituting the Applicant, i.e., its proposed partners, subcontractors or suppliers for any part of the Contract including related services.

3.3 Applicants from country(s) in the list of Eligible Countries as per World Bank norms shall be allowed to participate.Firms that are debarred from participating in World Bank projects and other State/Central level agencies/departments in India are not considered eligible to participate.

3.4 An Applicant shall submit only one application in the same Prequalification process, either individually as an Applicant or as a partner of a joint venture.No Applicant can be a Joint venture partner while submitting an application individually.An Applicant who submits, or participates in, more than one application will cause all the applications in which the Applicant has participated to be disqualified.

3.5 Applicants shall not be under default (execution) of a Bid Security, Performance Security or any other form Bid–Securing Declaration in India.

3.6 Applicants and all parties constituting the Applicant shall provide such evidence of their continued eligibility satisfactory to the Owner, as the Owner shall reasonably request.

4. Eligible Equipments and Related Services

4.1 All material, equipments, goods and related services to be procured/ used for the Project shall be from Manufacturers or Consultants of good repute, approved by BIS (IS), DGS&D or similar approval authority, codes, norms and standards.

B.CONTENTS OF THE PREQUALIFICATION DOCUMENT

5. Sections of Prequalification Document

5.1 The document for the Prequalification of Applicants (hereinafter - "Prequalification document") consists of parts 1 and 2, which comprise all the sections indicated below, and should be read in conjunction with any Addendum issued in accordance with ITA 7.

PART 1 Pre-qualification Document

- Section I. Instructions to Applicants (ITA)
- Section II. Prequalification Data Sheet (PDS)
- Section III Qualification Criteria and Requirements
- Section IV. Application Forms

PART 2 Project Information Document

- Section V. Description of Project & Scope of Works

5.2 The "Invitation for Prequalification Applications" issued by the Owner is also to be considered as a part of the Prequalification document.

5.3 The Owner accepts no responsibility for the completeness of the Prequalification document and its addenda unless they were obtained directly from the Owner.

5.4 The Applicant is expected to examine all instructions, forms, and terms in the Prequalification Document and to furnish all information or documentation required by the Prequalification Document.

6. Clarification of Prequalification Document

6.1 A prospective Applicant requiring any clarification of the Prequalification Document shall contact the Owner in writing at address indicated in the PDS. The Owner will respond in writing to any request for clarification provided that such request is received no later than fourteen (14) days prior to the deadline for submission of applications. The Owner shall make available its response at the official webpage (as mentioned in PDS) including a description of the inquiry but without identifying its source. Should the Owner deem it necessary to amend the Prequalification document as a result of any clarification, it shall do so following the procedure under ITA 7 and in accordance with the provisions of ITA 16.2.

7. Amendment of Prequalification Document

7.1 At any time prior to the deadline for submission of applications, the Owner may amend the Prequalification Document by issuing addenda.

7.2 Any addendum issued shall be part of the Prequalification Document and shall be communicated as per provisions specified in ITA 6.1

7.3 To give prospective Applicants reasonable time to take an addendum into account in preparing their applications, the Owner may, at its discretion, extend the deadline for the submission of applications.

C. PREPARATION OF APPLICATIONS

8. Cost of Applications

8.1 The Applicant shall bear all costs including visits to the site associated with the preparation and submission of its application. The Owner will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Pre-qualification process.

9. Language of Application

9.1 The application as well as all correspondence and documents relating to the Pre-qualification exchanged by the Applicant and Owner, shall be written in the language specified in the PDS.

10. Documents Comprising the Application

The application shall comprise the following:

- Requisite Application Fees (as per PDS);
- Application Submission Form, in accordance with ITA 11;
- Documentary evidence establishing the Applicant's eligibility to Prequalify, in accordance with ITA 12;
- Documentary evidence establishing the Applicant's qualifications, in accordance with ITA 13; and
- Any other document required as specified in the PDS

11. Application Submission Form

11.1 The Applicant shall prepare an Application Submission Sheet using the form furnished in Section IV, Application Forms. This Form must be completed without any alteration to its format.

12. Documents Establishing the Eligibility of the Applicant

12.1 To establish its eligibility in accordance with ITA 3, the Applicant shall complete the eligibility declarations in the Application Submission Form and Forms ELI (eligibility) 1.1 and 1.2, included in Section IV, Application Forms.

13. Documents Establishing the Qualifications of the Applicant

13.1 To establish its qualifications to implement the Project in accordance with Section III, Qualification Criteria and Requirements, the Applicant shall provide the information requested in the corresponding Information Sheets included in Section IV, Application Forms.

14. Signing of the Application and Number of Copies

14.1 The Applicant shall prepare one original of the documents comprising the application as described in ITA 10 and clearly mark it "ORIGINAL". The original of the application shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Applicant.

14.2 The Applicant shall submit copies of the signed original application, in the number specified in the PDS, and clearly mark them "COPY". In the event of any discrepancy between the original and the copies, the original shall prevail.

D. SUBMISSION OF APPLICATIONS

15. Sealing and Identification of Applications

15.1 The Applicant shall enclose the original and the copies of the application in a sealed envelope that shall:

- bear the name and address of the Applicant
- be addressed to Madurai Municipal Corporation, in accordance with ITA 16.1; and
- bear the specific identification of this Prequalification process indicated in the PDS 1.1.

15.2 Madurai Corporation or Owner will accept no responsibility for not processing any envelope that was not identified as required.

16. Deadline for Submission of Applications

16.1 Applicants shall submit completed applications by registered post, courier or by direct delivery. Applications shall be received by the Owner at the address and no later than the deadline indicated in the PDS. A confirmation of receipt of Prequalification Documents will be given upon request of Applicant.

16.2 The Owner may, at its discretion, extend the deadline for the submission of applications by amending the Prequalification Document in accordance with ITA 7, in which case all rights and obligations of the Owner and the Applicants subject to the previous deadline shall thereafter be subject to the deadline as extended.

17.	**Late Applications**	17.1	Any application received after the deadline for submission of applications prescribed in accordance with ITA 16 will be summarily rejected.
18.	**Opening of Applications**	18.1	The Owner shall prepare an internal record of the opening of applications. The process of opening shall be internal and only outcome of the application shall be communicated to the respective Applicant(s).

E. PROCEDURES FOR EVALUATION OF APPLICATIONS

19.	**Confidentiality**	19.1	Information relating to the evaluation of applications, and recommendation for Prequalification, shall not be disclosed to Applicants or any other persons not officially concerned with such process.
		19.2	From the deadline for submission of applications to the time of notification of the results of the Pre-qualification in accordance with ITA 27, any Applicant that wishes to contact the Owner on any matter related to the Prequalification process, may do so but only in writing.
20.	**Clarification of Applications**	20.1	To assist in the evaluation of applications, the Owner may, at its discretion, ask any Applicant for a clarification of its application which shall be submitted within a stated reasonable period of time. Any request for clarification and all clarifications shall be in writing.
		20.2	If an Applicant does not provide clarifications of the information requested by the date and time set in the Owner's request for clarification, its application may be rejected.
21.	**Responsiveness of Applications**	21.1	The Owner may reject any application, which is not responsive to the requirements of the Pre-qualification document.
22.	**Domestic Bidder Price Preference**	22.1	Unless otherwise specified in the PDS, a margin of preference for domestic bidders shall not apply in the bidding process resulting from this Pre-qualification.
23.	**Consultants**	23.1	Applicants shall be free to hire any reputed Consultants for the Project as also indicated in ITA 4.1.

F. EVALUATION OF APPLICATIONS AND PREQUALIFICATION OF APPLICANTS

24.	**Evaluation of Applications**	24.1	The Owner shall use the factors, methods, criteria, and requirements defined in Section III, "Qualification Criteria and Requirements" to evaluate the qualifications of the Applicants. The use of other methods, criteria, or requirements shall not be permitted. The Owner reserves the right to waive minor deviations in the qualification criteria if they do not materially affect the capability of an Applicant to execute and/or operate the Project.
25.	**Owner's Right to Accept or Reject Applications**	25.1	The Owner reserves the right to accept or reject any application, and to annul the Pre-qualification process and reject all applications at any time, without thereby incurring any liability to Applicants.
26.	**Pre-qualification of Applicants**	26.1	All Applicants whose applications have met or exceeded ("passed") the specified threshold requirements will, to the exclusion of all others, be pre-qualified by Madurai Corporation.

27.	**Notification of Prequalification**	27.1	Once Madurai Corporation has completed the evaluation of the applications it shall notify all Applicants in writing of the outcome of their Application for Pre-qualification.
28.	**Invitation to Bid**	28.1	Promptly after the notification of the results of the Pre-qualification Madurai Corporation may issue Bid Documents to all the Applicants that have been Pre-qualified.
		28.2	Bidders may be required to pay a reasonable fee for Bid documents and/or provide a Bid Security acceptable to Madurai Corporation in the form and amount as may be specified in the Bidding Documents, and the successful Bidder may also be required to provide a Performance Security, as may be specified in the Bid Documents.
29.	**Changes in Qualifications of Applicants**	29.1	Any change in the structure or formation of an Applicant after being Pre-qualified in accordance with ITA 26 and invited to bid shall be subject to a written approval of Madurai Corporation prior to the deadline for submission of Bids.Such approval shall be denied if as a consequence of the change, the Applicant no longer substantially meets the qualification criteria set forth in Section III, "Qualification Criteria and Requirements", or if in the opinion of Madurai Corporation, a substantial reduction in competition may result.Any such changes shall be submitted to Madurai Corporation not later than 14 days after the date of the Invitation for Bids.

Note : The Bidder should give the required particulars only in the follwing performa.**Required Particulars not given in the performa is liable for rejection.**

1. Section III – Historical Contract Non-Performance
2. Section III – Financial Situation
3. Section III – Experience
4. Section IV – Application submission form
5. Section IV –Applicant Information Form
6. Section IV – Applicant's Party Information Form
7. Section IV – Historical Contract Non-Performance
8. Section IV – Financial Situation
9. Section IV – General Infrastructure Experience
10. Section IV – Similar Project Experience

Section II. Pre-qualification Data Sheet (PDS)	
A. General	
ITA 1.1	**MADURAI CORPORATION or Owner refers to:** Madurai Municipal Corporation, Aringnar Anna Maaligai, Thallakulam, Madurai 625 002, TN, India
ITA 1.5	For broad Scope of Works, please refer Part 2 (PID)
ITA 2.1	The name of the Project is: "Development Construction Operation and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility in Madurai Corporation" on PPP mode.
ITA 3.1	(i) The parties in a JV shall be jointly and severally liable. (ii) Maximum number of partners in the JV shall be limited to 3 (Three Only).
B. Contents of the Prequalification Document	
ITA 6.1	For clarification purposes, the Owner's address is: MADURAI CORPORATION Aringnar Anna Maaligai, Thallakulam Madurai 625 002, TN, India Telephone: 0452 – 2530521-26 Facsimile number: 0452 – 2530965 Contact Person: Commissioner E - mail address: mducorp@yahoo.com
ITA 6.1	Websites at which any responses/addenda (if any) will be made available are: • Madurai Municipal Corporation – ***http://www.maduraicorporation.in*** • The Tamil Nadu Government Tenders Information System - ***http://www.tenders.tn.gov.in*** • Commissionerate of Municipal Administration - ***http://municipality.tn.gov.in/tenders***
C. Preparation of Applications	
ITA 9.1	The language of the application as well as of all correspondence is: ENGLISH
ITA 10.1 (a)	The requisite application fee shall be submitted along with "ORIGINAL" copy of the Application (in accordance with ITA 14). The amount of fees to be paid is: • Indian Applicants INR 10,000 /- (Rupees Ten Thousand Only) • Foreign Applicants USD 250/- (US Dollars Two fifty Only) The Application Fee shall be in the form of Demand Draft/ Pay Order in favour of "Commissioner, Madurai Municipal Corporation" payable at Madurai, Tamil Nadu, India

ITA 10.1 (e)	The Applicant shall submit with its application, the following additional documents: Completion Certificates of major solid waste processing/ disposal projects as well as other similar infrastructure projects (for example water supply, sewerage, hazardous waste management etc.) completed in last 5 years. Projects completed on a BOOT, DBOT, BOT basis are also preferred.
ITA 14.2	In addition to the original, the number of copies to be submitted with the application is: TWO
D. Submission of Applications	
ITA 16.1	Completed applications in the prescribed format must be submitted at the specified location and no later than the deadline for application submission specified. For application submission purposes, MADURAI CORPORATION's address is same as in 6.1 The deadline for application submission is: **Date: 22.11.2007** **Time: 15.00 Hours Indian Standard Time**
E. Procedures for Evaluation of Applications	
ITA 22.1	Margin of preference shall not apply for eligible domestic bidders.

Section III. Qualification Criteria and Requirements

This Section contains all the methods, criteria, and requirements that MADURAI CORPORATION shall use to evaluate applications.The information to be provided in relation to each requirement and the definitions of the corresponding terms are included in the respective Application Forms.

CONTENTS

	Eligibility and Qualification Criteria		**Compliance Requirements**				**Documentation**
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture**			**Submission Requirements**
				All Parties Combined	**Each Partner**	**One Partner**	
1. Historical Contract Non-Performance							
1.1	**History of Non-Performing Contracts** *1	Non-performance of any contract did not occur within the last Five (5) years prior to the deadline for application submission, based on all information on fully settled disputes or litigation.	Must meet requirement by itself or as partner to past or existing JV	N/A	Must meet requirement by itself or as partner to past or existing JV	N/A	Form CON-1
1.2	**Pending Litigation**	All pending litigation shall in total not represent more than 10%, (Ten percentage) of the Applicant's net worth and shall be treated as resolved against the Applicant.	Must meet requirement by itself or as a partner to past or existing JV	N/A	Must meet requirement by itself or as a partner to past or existing JV	N/A	Form CON – 1

*1 A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract and where all appeal instances available to the applicant have been exhausted.

Eligibility and Qualification Criteria			**Compliance Requirements**				**Documentation**
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture**			**Submission Requirements**
				All Parties Combined	**Each Partner**	**One Partner**	
2. Financial Situation							
2.1	**Financial Performance**	Submission of audited balance sheets or other financial statements acceptable to the Owner, for the last 5 (Five) years					
2.2	**Average Annual financial parameters**	(a) Minimum Annual Net Worth of INR 250 Million (INR Two Hundred and Fifty Million Only) in any two year over the last five (5) years,	Must meet requirement	Must meet requirement	Must meet 25%, [Twenty Five Percent] of the requirement	Must meet 50%, [Fifty Percent] of the requirement	Form FIN – 3.1
		(b) Minimum annual PBT (Profit Before Tax) of INR 125 Million (INR One Hundred and Twenty Five Million Only) in any two year over the last five (5) years.	Must meet requirement	Must meet requirement	N/A	N/A	Form FIN – 3.1

Eligibility and Qualification Criteria			**Compliance Requirements**				**Documentation**
No.	**Subject**	**Requirement**	**Single Entity**	**Joint Venture**			**Submission Requirements**
				All Parties Combined	**Each Partner**	**One Partner**	
3. Experience							
3.1	**General Infrastructure Experience**	Experience under Infrastructure projects in the role of Developer/ Promoter/ Contractor on BOOT, BOT, DBOT or similar basis in the last five (5) years prior to the application submission deadline.	Must meet requirement	Must meet requirement	N/A	N/A	Form EXP – 4.1
3.2	**Eligibility Conditions** *2	Participation as Developer within last 5 (Five) years, in at least: One (1) Project with a value of at least INR 400 Million (INR Four Hundred Million only) or equivalent. Or 2 (Two) Projects each with a value of at least INR 200 Million (INR Two Hundred Million only) or equivalent.	Must meet requirement	Must meet requirement	N/A	N/A	Form EXP 4.2
*2	Only those Projects be counted for above that have been successfully and substantially completed and that are similar to the proposed works. The similarity shall be based on the Project being an infrastructure Project on DBOT, BOT, BOO, BOOT basis with similar arrangements as described in Section V, Scope of Works (PID)						

Section IV.Application Forms

TABLE OF FORMS

Application Submission Form

Date: [insert day, month, year]
NCB No.and title: [insert NCB number and title]

To:

The Commissioner
Madurai Municipal Corporation
Aringnar Anna Maaligai
Thallakulam, Madurai – 625 002
Tamil Nadu, India

We, the undersigned, apply to be Pre-qualified for the referenced NCB and declare that:

i We have examined and have no reservations to the Prequalification Documents, including Addendum(s) No(s).___, issued in accordance with Instructions to Applicants (ITA) Clause 7: [insert the number and issuing date of each addendum] and are applying for the following package or packages:

a.
b.
c.

ii. We, including any JV Partner of the Project resulting from this Prequalification, have not been declared ineligible by MADURAI CORPORATION, Govt.of Tamil Nadu and/or World Bank, or under the Indian laws, official regulations, or under default (execution) of a Bid Securing Declaration in India, in accordance with ITA Sub-Clauses 3;

iii. We understand that you may cancel the Prequalification process at any time and that you are neither bound to accept any application that you may receive nor to invite the Pre-qualified applicants to bid for the Project subject of this Prequalification, without incurring any liability to the Applicants, in accordance with ITA Clause 25.

iv. The requisite payment of [insert as applicable] as per ITA 10.1(a) is [enclosed herewith] as per following details:

[*Insert details*]

Signed [*insert signature(s) of an authorized representative(s) of the Applicant*]

Name [*insert full name of person signing the application*]

In the Capacity of [*insert capacity of person signing the application*]

Duly authorized to sign the application for and on behalf of:

Applicant's Name [*insert full name of Applicant*] Address [*insert street number/town or city/country address*]

Dated on [*insert day number*] *day of* [*insert month*], [*insert year*]

FORM ELI -1.1

Applicant Information Form

Date: [*insert day, month, year*]
NCB No.and title: [*insert NCB number and title*]
Page [*insert page number*] of [*insert total number*] pages

Applicant's legal name [*insert full legal name*]
In case of Joint Venture (JV), legal name of each partner: [*insert full legal name of each partner in JV*]
Applicant's Actual or Intended country of constitution: [*indicate country of Constitution*]
Applicant's actual or Intended year of constitution: [*indicate year of Constitution*]
Applicant's legal address in country of constitution: [*insert street/ number/ town or city/ country*]
Applicant's authorized representative information Name: [*insert full legal name*] Address: [*insert street/ number/ town or city/ country*] Telephone/Fax numbers: [*insert telephone/fax numbers, including country and city codes*] E-mail address: [*indicate e-mail address*]
Attached are copies of original documents of • Articles of Incorporation or Documents of Constitution, and documents of registration of the legal entity named above, in accordance with ITA 3.2. • In case of JV, letter of intent to form JV or JV agreement, in accordance with ITA 3.1. • Authorization by the Applicant to its Authorized signatory (Authorized representative) in form of Power of Attorney of Board Resolution.

FORM ELI-1.2

Applicant's Party Information Form

[The following form shall be filled in for all the Applicant's parties including partner(s) of a joint venture]

Date: ~insert day, month, year
NCB No.and title: ~insert NCB number and title
Page ~insert page number of ~insert total number pages

JV applicant legal name: [*insert full legal name*]
Applicant's Party legal name: [*insert full legal name of Applicant's Party*]
Applicant's Party country of registration: [*indicate country of registration*]
Applicant Party's year of constitution: [*indicate year of constitution*]
Applicant Party's legal address in country of constitution: [*insert street/ number/ town or city/ country*]
Applicant Party's authorized representative information Name: [*insert full legal name*] Address: [*insert street/ number/ town or city/ country*] Telephone/Fax numbers: [*insert telephone/fax numbers, including country and city codes*] E-mail address: [*indicate e-mail address*]
Attached are copies of original documents of • Articles of Incorporation or Documents of Constitution, and Registration Documents of the legal entity named above, in accordance with ITA 3.2.

FORM CON – 1

Historical Contract Non-Performance

[The following table shall be filled in for the Applicant and for each partner of a Joint Venture]

Applicant's Legal Name: [insert full name]
Date: [insert day, month, year]
Joint Venture Party Legal Name:[insert full name]
NCB No.and title: [insert NCB number and title]
Page [insert page number] of [insert total number] pages

Non-Performing Contracts in accordance with Section III, Qualification Criteria and Requirements			
Contract non-performance did not occur during the 5 (Five) years specified in Section III, Qualification Criteria and Requirements, Sub-Factor 1.1. (Contract(s) not performed during the 5 (Five) years specified in Section III, Qualification Criteria and Requirements, requirement 1.1			
Year	Non performed portion of contract	Contract Identification	Total Contract Amount (current value, INR equivalent)
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Employer/Developer: [insert full name] Address of Employer/Developer: [insert street/city/ country] Reason(s) for non performance: [indicate main reason(s)]	[insert amount]
Pending Litigation, in accordance with Section III, Qualification Criteria and Requirements			
(No pending litigation in accordance with Section III, Qualification Criteria and Requirements, Sub-Factor 1.2.			
(Pending litigation in accordance with Section III, Qualification Criteria and Requirements, Sub-Factor 1.2 as indicated below.			
Year	Outcome as Percentage of Total Assets	Contract Identification	Total Contract Amount (current value, INR equivalent)
[insert year]	[insert percentage]	Contract Identification: [indicate complete contract name, number, and any other identification] Name of Employer/Developer: [insert full name] Address of Employer/Developer: [insert street/city/ country] Matter in dispute: [indicate main issues in dispute]	[insert amount]

FORM FIN – 3.1

Financial Situation

[The following table shall be filled in for the Applicant as well as each partner of a Joint Venture]

Applicant's Legal Name: [*insert full name*]

Date: [*insert day, month, year*]
Applicant's Party Legal Name:[*insert full name*]
NCB No. and title: [*insert NCB number and title*]
Page [*insert page number*] of [*insert total number*] pages

1. Financial data

Financial information in (INR equivalent in 000,000s)	**Historic information for previous Five (5) Years (INR equivalent in 000,000s)**				
	Year 1	Year 2	Year 3	Year 4	Year 5
Mention the Tenure (eg. 2005 – 06 or 2006)	(Tenure)	(Tenure)	(Tenure)	(Tenure)	(Tenure)
Information from Balance Sheet					
Total Assets (TA)					
Total Liabilities (TL)					
Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					

2. Financial documents

The Applicant and its parties shall provide certified (signed and sealed) true copies of the balance sheets and/or financial statements for Five (5) years pursuant Section III, Qualifications Criteria and Requirements, Sub-factor 2.1. The financial statements shall:

(a) reflect the financial situation of the Applicant or partner to a JV, and not their sister or parent companies or other affiliates.
(b) be audited by a certified accountant and signed and sealed accordingly.
(c) be complete, including all notes to the financial statements.
(d) Correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

- Attached are certified (signed and sealed) true copies of financial statements (balance sheets, including all related notes, and income statements) for the preceding Five (5) years required above; and complying with the requirements

FORM EXP - 4.1

General Infrastructure Experience

[The following table shall be filled in for the Applicant as well as for each partner of a Joint Venture]

Applicant's/Joint Venture Partner's Legal Name: [*insert full name*]
Date: [*insert day, month, year*]
Applicant JV Party Legal Name: [*insert full name*]
NCB No. and title: [*insert NCB number*]
Page [*insert page number*] of [*insert total number*] pages

[Identify contracts that demonstrate continuous infrastructure projects experience over the past 5 (Five) years pursuant to Section III, Qualification Criteria and Requirements, Sub-Factor 3.1.List contracts chronologically, according to their commencement (starting) dates.]

Starting Month / Year	Ending Month / Year	Contract Identification	Role of Applicant
[*indicate month/ year*]	[*indicate month/ year*]	Project name: [*insert full name*] Brief Description of the Project performed by the Applicant: [*describe works performed briefly*] Total Investment in the Project: [insert amount in INR equivalent] Equity Contribution of the Applicant (if as JV Partner): [*insert in percentage*] Name of Employer/Developer: [*indicate full name*] Address: [*indicate street/number/town or city/ country*]	(*insert "Sole Developer" or "JV Partner"*]
[*indicate month/ year*]	[*indicate month/ year*]	Project name: [*insert full name*] Brief Description of the Project performed by the Applicant: [*describe works performed briefly*] Total Investment in the Project: [*insert amount in INR equivalent*] Equity Contribution of the Applicant (*if as JV Partner*): [*insert in percentage*] Name of Employer/Developer: [*indicate full name*] Address: [*indicate street/number/town or city/ country*]	(*insert "Sole Developer" or "JV Partner"*]

FORM EXP - 4.2

Similar Project Experience

[The following table shall be filled in for contracts performed by the Applicant, and each partner of a Joint Venture]

Applicant's/Joint Venture Partner's Legal Name: [*insert full name*]
Date: [*insert day, month, year*]
JV Party Name: [*insert full name*]
NCB No. and title: [*insert NCB number and title*]
Page [*insert page number*] of [*insert total number*] pages

Similar Project No. [insert number] of [insert number of similar contracts required]	**Information**		
Project Identification	[*insert Project name and number, if applicable*]		
Award date	[*insert day, month, year, i. e., 15 June, 2005*]		
Date of Commissioning	[*insert day, month, year, i. e., 15 June, 2005*]		
Completion date	[*insert day, month, year, i. e., 15 June, 2005*]		
Project Scope	[*insert Project details and scope of works*]		
Role in Contract [check the appropriate box]	Sole Developer ☐	JV Partner ☐	
Total Project Amount	[insert total Project amount in local currency]		INR [*insert total Project amount in INR equivalent*]
If partner in a JV, or subcontractor, specify participation in total Project amount	[*insert a percentage amount*]	[*insert total Project amount in local currency*]	[*insert total Project amount in INR equivalent*]
Employer/Developer's Name:	[*insert full name*]		
Address: Telephone/fax number E-mail:	[*indicate street / number / town or city / country*] [*insert telephone/fax numbers, including country and city area codes*] [*insert e-mail address, if available*]		

Part 2 Project Information Document

SECTION V

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1.0 Background

Madurai Municipal Corporation manages the existing Municipal Solid Waste (hereinafter referred to as "MSW") Management System in Madurai Corporation limits.

MSW is collected from all sources of generation such as residential households, markets, wedding halls, institutions, commercial entities and others on a daily basis.The collected mixed waste is then transported through bulk carriers to the existing MSW processing and disposal site in Avaniyapuram, Madurai on the southern boundary of the city.

However, the present system of MSW disposal is through open dumping over the area extent of nearly 110 acres which has resulted in degradation of the environment.Madurai Municipal Corporation envisages improvements to the existing system of Municipal Solid Waste Management in Madurai to ensure compliance with applicable rules and regulations under the aegis of the Ministry of Urban Development, Government of India initiative Jawaharlal Nehru National Urban Renewal Mission (JnNURM).

2.0 Project Location

Madurai is the second largest city in Tamil Nadu and situated approximately 500 km south of the state capital Chennai.Madurai is well connected by Rail, Road and Air to all major cities of the state and the country.Madurai is a major junction on the Chennai - Kanyakumari Railway line.National Highways NH-7 and NH-49 pass through the city.

Madurai is situated approximately 100 m above MSL.The terrain of the city is gradually sloped from the north to south and west to east.Vaigai River bisects the city into the North and South zones with the north sloped towards Vaigai River and the south zone sloped away from the river.

The project has been accorded approval by the JnNURM at an approved cost of Rs.742.90 Million, which includes improvements to the Primary & Secondary Collection System and MSW Processing & Disposal System in compliance with applicable rules and regulations.

3.0 Project Details

The population of Madurai City as per the 2001 census is 9.20 Lakhs and 10.40 Lakhs as per enumeration by Corporation and estimated population at present (2006) is about 11.17 Lakhs.The city is spread over an area of 52 sq.km.The city comprises 72 wards.

Madurai City has been divided into four (4) administrative zones.The existing per capita waste generation is approximately 0.380 kg/capita/day.The entire waste is collected, transported and dumped into the existing site owned by Madurai Municipal Corporation at Vellakkal, Avaniyapuram on the south of Madurai.The dumping site at Vellakkal has an area to an extent of 110 acres for disposing the solid waste.At present, more than 75% of the area has been covered by dumping at the landfill site.

4.0 Proposal Details

- Madurai Corporation proposes to rehabilitate and augment the existing Municipal Solid Waste Management System by way of providing additional equipment and machineries for collection and transportation of waste and processing, treatment and disposal of about 450 MT of municipal mixed waste per day.
- The population projection of Madurai City for 2006 AD and 2026 AD are 11.17 Lakhs and 15.22 Lakhs respectively and a present floating population of approximately 2.00 Lakhs.The population figures are based on City Development Plan for Madurai City.
- Door to door collection of segregated waste using separate containers through the sanitary workers of Madurai Municipal Corporation has been proposed.

- Equipment for source segregation using two-bin system, collection of segregated waste in separate containers, street sweeping and personal protection and handling equipment for the street sweepers and sanitary workers have been proposed and shall be procured as per the norms specified in the CPHEEO Manual.
- Equipment for secondary collection and transportation of MSW to the proposed in integrated MSW Processing and Disposal facility have been made in accordance with the guidelines prescribed in the CPHEEO Manual.
- Bio-degradable waste shall be processing through establishment of an Aerobic Composting Plant
- Non-Biodegradable and Non-Recyclable waste shall be disposed through establishment of a Sanitary Landfill.Recyclable waste shall be salvaged for revenue generation.
- Existing accumulated and mixed waste dumped at the site shall be disposed at the above-mentioned Sanitary Landfill.
- Auxiliary Facilities at the MSW Processing & Disposal Complex such as, but not necessarily limited to, Inspection Yard (Post-Segregation), Monsoon Shed, Finished Compost Storage/ Bagging Section, Administration and Utilities Block, Stores, Workshop, Vehicle Parking and Washing Facility, Electrical Sub-station and related works.
- Madurai Corporation is undertaking certain initiatives to introduce segregation-at-source through introduction of a two-bin system of collection and transportation.However, it is the responsibility of the successful bidder to ensure proper segregation through establishment of required segregation facility.
- Madurai Corporation is also undertaking initiatives for landfill space optimization by exploring alternatives for diverting wastes that are not bio-degradable and non-recyclable such as rubber, soiled cloth and similar waste to Cement Industries in the region for use as supplemental fuel.Bidders shall also consider the same.

5.0 Project Contractual Structure

The selected bidder would be required to invest 30% of the finalized project cost in the Special Purpose Vehicle (SPV) to be formed so as to fulfill its obligations under the following contractual obligations:

Concession Agreement and Land Lease Agreement with the Madurai Municipal Corporation (MADURAI CORPORATION) for 20 years for the extent of land to be allotted for implementation of the project

The Project shall be undertaken by the successful bidder on Design, Build, Operate and Transfer (DBOT) basis through Public-Private Partnership Mode for a period of 20 years.

6.0 Project Status & Cost

The Ministry of Urban Development, Government of India has approved the DPR during its 21st meeting of the Central Sanctioning and Monitoring Committee (CSMC).The appraisal agency for the project namely Central Public Health and Environmental Engineering Organization (CPHEEO) have also issued their technical comments on the project.Based on the DPR, the cost of the Project (for MSW Processing and Disposal) is estimated to be approximately INR Rs.570 Million.

7.0 Permits & Clearances

Statutory and other mandatory clearances, including but not necessarily limited to, clearance from pertinent authorities such as TN Pollution Control Board, Airport Authority of India, Air Force Safety, Department of Town and Country Planning, Public Works Department (Groundwater Board) and

others for successful establishment, construction, operation, maintenance, closure and post closure monitoring as applicable shall be obtained by the selected Bidder.The responsibility of ensuring full compliance with the pertinent clearances and permits including, but not necessarily limited to, stipulated periodical renewals, upgrades, modifications and other related activities shall rest with the Successful Bidder.

8.0 Proposed Bidding Frame Work

The project offers an attractive proposition for potential investors and MADURAI CORPORATION invites applications from interested bidders under the Request for Qualification (RFQ) document.

The selection of the successful bidder would be carried out in two-steps.Qualified Bidders per the RFQ shall be issued Request for Proposal (RFP) document.The Bidders shall be required to submit detailed technical proposals along with financial proposals.Financial proposals of only those bidders, who satisfy the minimum qualifying requirements on the technical parameters, would be opened for further evaluation.

Proposals shall be evaluated based on criteria specified in the RFP from technical and financial standpoints comprising the below listed, but not necessarily limited to, parameters:

- Design and Construction Schedule
- Estimated Cost of Construction including quantities and rates
- Lowest Cost of Annual Operation & Maintenance Charges

The financial proposal obtaining the highest combined score shall be selected for execution of requisite contracts/concession agreement on DBOT basis.Preference would be given to Bidders who have completed or successfully engaged in similar infrastructure projects on BOT, DBOT, BOOT or similar basis and have executed projects that involve revenue sharing with the Client/Owner.

REQUEST FOR PROPOSAL

FOR

CONSTRUCTION AND MAINTENANCE OF INTEGRATED MUNICIPAL SOLID WASTE PROCESSING AND DISPOSAL FACILITY IN MADURAI

ON

PUBLIC-PRIVATE-PARTNERSHIP (“PPP”) MODE

FOR

MADURAI MUNICIPAL CORPORATION
MADURAI, TAMIL NADU

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SCHEDULE OF BIDDING PROCESS

S. No.	Event Description	Date
1	Issue of RFP to Applicants	
2	Last Date for receiving written queries	
3	Pre-Bid Conference	
4	Last Date for Submission of Proposals	
5	Informing Bidders about opening of Financial Proposals	
6	Opening of Financial Proposals	
7	Finalisation of Bidder	

DISCLAIMER

This Request for Proposal (RFP) is issued by Madurai Municipal Corporation (MMC)

The RFP is not a prospectus or offer on invitation to the public in relation to the sale of shares, debentures or securities, nor shall this RFP or any part of it form the basis of or be relied upon in any way in connection with, any contract relating to any shares, debentures or securities.In considering an investment, if any, in the proposed Project, each recipient should make its own independent assessment and seek its own professional, technical, financial and legal advice.

Whilst the information in this RFP has been prepared in good faith, it is not and does not purport to be comprehensive or to have been independently verified. Neither MMC nor any of their officers or employees, nor any of their advisers nor consultants, accept any liability or responsibility for the accuracy, reasonableness or completeness of, or for any errors, omissions or misstatements, negligent or otherwise, relating to the proposed Project, or makes any representation or warranty, express or implied, with respect to the information contained in this RFP or on which this RFP is based or with respect to any written or oral information made or to be made available to any of the recipients or their professional advisers and, so far as permitted by law and except in the case of fraudulent misrepresentation by the party concerned, and liability therefore is hereby expressly disclaimed.

The information contained in this RFP is selective and is subject to updating, expansion, revision and amendment. It does not, and does not purport to, contain all the information that a recipient may require. Neither MMC nor any of their officers, employees nor any of its advisors nor consultants undertakes to provide any recipient with access to any additional information or to update the information in this RFP or to correct any inaccuracies therein which may become apparent. Each recipient must conduct its own analysis of the information contained in this RFP or to correct any inaccuracies therein that may this RFP and is advised to carryout its own investigation into the proposed Project, the legislative and regulatory regime which applies thereto and by and all matters pertinent to the proposed Project and to seek its own professional advice on the legal, financial, regulatory and taxation consequences of entering into any agreement or arrangement relating to the proposed Project.

This RFP includes certain statements, estimates, projections, designs, targets and forecasts with respect to the Project. Such statements, estimates, projections, targets and forecasts, designs reflect various assumptions made by the management, officers and employees of MMC, which assumptions (and the base information on which they are made) may or may not prove to be correct. No representation or warranty is given as to the reasonableness of forecasts or the assumptions on which they may be based and nothing in this RFP is, or should be relief on as, a promise, representation or warranty.

REQUEST FOR PROPOSAL

International Competitive Bidding for an Integrated Municipal Solid Waste Management Project in Madurai City in Tamilnadu through Public-Private-Partnership mode

1. Madurai Municipal Corporation ("MMC") invites Technical and Financial Proposal from eligible bidders/ who have been pre-qualified to participate ("Bidders") in Designing, Building, Financing and Operating a Municipal Solid Waste Processing & disposal facility Project and on Public-Private-Partnership ("PPP") model for city of Madurai (the "Project"), in the State of Tamilnadu covering the following aspects as per terms of the Concession Agreement.
   - Establishing a processing facility to process MSW using aerobic composting along with other suitable options and operation & maintenance of such facilities
   - Development of landfill to accommodate mixed waste from existing disposal site.
   - Construction & Development of Sanitary Landfill Facility (SLF) and operation and maintenance of the same for the disposal of inerts & processing rejects & to accommodate mixed waste from existing disposal site in line with MSW Rules 2000

   The above activities will be referred as the "Project" in the subsequent paragraphs.
2. The scope of work for the Bidder includes development, plan, design & engineering, financing of any funds over and above 70% of approved DPR Costs including any additional facilities created, construction and operation & maintenance of the Project including transportation of processing rejects from the processing facility to SLF and marketing and sale of any/all products and by-products including recyclables such as paper, plastics, etc. The bidder may note that up to 70% of the approved DPR cost shall be made available by MMC under JNNURM and terms of release of such funds are detailed out in Annexure –8.
3. The project has been approved under Jawaharlal Nehru Urban Renewal Mission (JNNURM) scheme of the Govt. of India and is eligible for Grants from Central / State government. The details of the approved budget and grants available for different components of the project are summarized in the Data Sheet and detailed out in DPR (Part IV). The 'Estimated Total Project Cost' or 'Estimated TPC', wherever mentioned, refers to the "Approved Project Cost" as provided in the Data Sheet.
4. MMC is a statutory body constituted under the Madurai Municipal Corporation Act 1971, and is responsible for providing among others, sanitation services to the city of Madurai in its municipal limits.
5. Madurai is the second largest city in Tamil Nadu and situated approximately 500 km south of the state capital Chennai. The city is well connected with air, road and railway links. The city has a vibrant economy and reasonably good physical infrastructure as compared to many other one million plus cities in India.
6. Madurai is situated approximately 100 m above MSL. The terrain of the city is gradually sloped from the north to south and west to east. Vaigai River bisects the city into the North and South zones with the north sloped towards Vaigai River and the south zone sloped away from the river.
7. The population of Madurai City as per the 2001 census is 9.20 Lakhs and 10.40 Lakhs as per enumeration by Corporation and estimated population in the year 2006 is about 11.17 Lakhs. The city comprises 72 wards
8. The city generates approximately 450 Tons per day of municipal solid waste ("MSW"). As a part of its responsibilities, MMC is now desirous of implementing the Project to provide

adequate processing & disposal facilities for MSW management in the city of Madurai. Being a million plus city, it is one of the 63 cities included as the mission cities under JNNURM scheme. MMC has got prepared the Detailed Project Report (DPR) through "Community Consultants India Pvt. Ltd., Chennai" on the MSW Management covering broad aspects that are required to be addressed for developing a suitable MSW management system. Thereafter, to structure the Project and finalise the bid document and also to assist MMC in selection of suitable developer in Public-Private-Partnership ("PPP") framework, MMC had mandated "IL&FS Infrastructure Development Corporation Limited (IIDC)" with its head office at New Delhi.

9. IIDC is a wholly owned subsidiary of Infrastructure Leasing & Financial Services Limited ("IL&FS") involved in development of infrastructure projects all over India on commercial format. IL&FS, the parent organization of IIDC is a leading institution of India, promoted by Public sector Financial Institutions and Banks of India including UTI, Central Bank of India and HDFC among others, with an objective, inter alia, of developing projects in the infrastructure sector on commercial basis. IL&FS group companies have significant experience and expertise to render advice, develop projects, facilitate formulation of policy and related aspects for catalysing Public Private Partnership, identify prospective developers, undertake mobilisation of financial resources from both the domestic Financial Institutions and multilateral agencies and participate as a co-promoter in specific projects.
10. The Project has been structured in PPP format. The land for the processing & disposal facility along with other necessary facilitation would be provided by MMC for enabling successful implementation of the Project.
11. An agreement will be signed up between MMC and the selected Bidder (the "Concession Agreement") clearly specifying the rights and duties of each party. Draft of the Concession Agreement is attached at Part II of this RFP. As per terms of the Concession Agreement, MMC shall transport MSW to the Processing plant site and deliver it at the waste receipt point(s) (within processing plant site) where weighment is carried out to ascertain the quantity supplied. The developer has to build and operate the processing as well as disposal site including weigh-bridges at Vellakkal. The MSW is to be processed through appropriate technologies including Composting and other suitable means like Refuse Derived Fuel (RDF), Bio-methanation etc as per need and the preferred choice of the developer and the inerts are to be disposed off in the Sanitary Landfill Facility (SLF), to be established & maintained by the developer in accordance with applicable laws and regulations. Any revenues from the sale of any recyclables/by-products of the MSW Processing including Compost, Refuse Derived Fuel (RDF), etc, will accrue to the selected developer (or the the "Concessionaire"). MMC would permit the Developer to use the space available at the project facilities for display of advertisements as per applicable provisions. MMC will be entitled to charge from the selected developer annual land lease rental, revenue share (if any offered by the Bidder as a part of its financial bid) and CDM shares as per terms of the Concession Agreement, for the entire Concession Period, and as per terms of the Bid parameters.
12. A copy of the draft Land Lease Agreement is also attached at Part III of this RFP.
13. The bidders who had qualified in the RFQ stage, based on their technical experience, qualifications and financial capabilities are being provided with this RFP document, which is priced at Rs. 25,000/- (Rupees Twenty Five Thousand only). The said payment has to be made in the form of Demand Draft payable on any scheduled bank in Madurai made in favour of "Madurai Municipal Corporation" and submitted along with

the submission of Technical Proposal in response to the RFP document at the address mentioned below:
The Superintending Engineer
Madurai Municipal Corporation (MMC)
Aringnar Anna Maaligai, Thallakulam
Madurai 625 002, TN, India
Telephone: 0452 –2530521-26
Facsimile: 0452 -2530965

The request for complete set of RFP (which includes the Concession Agreement, DPR & other Annexure) must be accompanied by a non-refundable fee as mentioned above.

14. For submission, evaluation and selection of a Developer a 'Two Stage Bidding' process has been adopted. After short listing of bidders in response & evaluation of RFQ received, now in this second stage, selected bidders requires to submit their proposal in two-cover system having their Technical Proposal and Financial Proposals separately. The Bidders would be required to meet the minimum specified technical score (for their Technical Proposal) for getting qualified for the next stage of evaluation -i.e. evaluation of Financial Proposal. To summarise, the Financial Proposal of only those Bidders who possess the minimum Technical score would be opened and evaluated.
14. Detailed information on evaluation criteria and methodology are available in Annex 5A hereto.
15. MMC will not be responsible for any delay, loss or non-receipt of RFP document(s) sent by post / courier. Further, MMC shall not be responsible for any delay in receiving the Proposal and reserves the rights to accept/ reject any or all applications without assigning any reason thereof.
16. Further, both parts of the Proposal (Technical Proposal & Financial Proposal) must be submitted in a hard bound form with all pages numbered serially, along with an index of submissions and the "Bid Security" has to be placed in the envelope/cover containing the Technical Proposal & should not be submitted in hard bound form. All figures quoted in the financial Proposal should be covered with a transparent adhesive tape. Bidders are required to submit all details only as per formats issued. The Bidders are also required to submit a draft of their Financial Proposal at the end of their Technical proposal, with figures being marked as XXXXX. In the event any of the instructions mentioned herein have not been adhered to, MMC will have the right to reject the Proposal at any stage.
17. RFP submissions must be received not later than 1500 hrs on the date for bid submission as indicated in the schedule of bidding process and in the manner specified in the RFP document at the address given below:

    The Superintending Engineer
    Madurai Municipal Corporation (MMC)
    Aringnar Anna Maaligai, Thallakulam
    Madurai 625 002, TN, India
    Telephone: 0452 –2530521-26
    Facsimile: 0452 -2530965

RFP PART I: INSTRUCTIONS TO BIDDERS

A. BIDDING PROCESS AND GENERAL GUIDELINES

1.1 Background / Introduction

1.1.1 Madurai Municipal Corporation - a statutory body constituted under the Madurai Municipal Corporation Act 1971 (hereinafter referred to as "MMC") had prepared the Detailed Project Report on Solid Waste Management for the city through "Community Consultant India Private Ltd., Chennai". The project has been approved under Jawaharlal Nehru Urban Renewal Mission (JNNURM) scheme of the Govt. of India and is eligible for grants from Central / State government. Thereafter MMC had mandated "IL&FS Infrastructure Development Corporation Limited (IIDC)" to assist MMC in structuring of the Project, to finalise the bid documents and to assist for - selection of suitable developer under Public-Private-Partnership ("PPP") framework.

1.1.2 Subsequently, MMC has finalized structuring of the project and developed bid documents and various agreements required for the project such as Concession Agreement, Land lease agreement etc. MMC / or the Special Purpose Vehicle (SPV) may also apply for various clearances required for the project. This arrangement has been envisaged to minimize time-delays in obtaining clearances. MMC will make all efforts to apply for the required clearances; however, MMC will not be responsible for getting any or all of such clearances that may be required for the project. In other words the selected developer will be responsible to follow-up and obtaining the clearances for which MMC/SPV has already applied and also for applying any other clearances that may be required for this project.

1.1.3 The scope of works for the Successful Bidder would be:

1. To Plan, Design, Built, Finance, Operate and Maintain the Integrated Municipal Solid Waste Management Facility consisting of the following, for the entire term of the Concession Period (as per Data Sheet). Land will be provided by MMC at an Annual Lease rental as specified in the Data Sheet.
   - Establishing a processing facility to process MSW using aerobic composting along with other suitable options and operation & maintenance of such facilities
   - Development of landfill to accommodate mixed waste from existing disposal site.
   - Construction & Development of Sanitary Landfill Facility (SLF) and operation and maintenance of the same for the disposal of inerts & processing rejects & to accommodate mixed waste from existing disposal site in line with MSW Rules 2000
2. To ensure that the Project is able to receive, handle, transport, process & dispose the MSW generated in the city of Madurai as per terms of the Concession Agreement
3. To ensure that the Project meets stipulated pollution norms and guidelines and that the municipal solid waste is handled and managed in compliance with the MSW (Handling and Management) Rules 2000 and the guidelines of the manual on solid waste management published by CPHEEO, MoUD, BIS etc.

1.1.4 The status of various activities in relation to the Project is as below:

1. Land of about 110 acres which is proposed for the processing & disposal facility for the project is already in possession of MMC at Vellakkal, Avaniyapuram on south of Madurai. At present, more than 75% of the area of this site has been covered by MSW dumping. New sanitary landfill facility site is to be developed on land available at the this site.

2. The draft of the Concession Agreement to be entered between the successful Bidder and MMC is enclosed as Part II of this RFP document.
3. Water for the Project has proposed to be extracted from the ground. The water may be provided by MMC at applicable user charges.
4. A DPR for the Project covering broad MSW management aspects has been prepared that is also approved under JNNURM scheme of Govt. of India. The DPR is available for download from the website of MMC. (The DPR contains primary information about the city of Madurai, broad characteristics of garbage (MSW), tentative MSW processing scheme, tentative layout plan, details of the Estimated Total Project Cost, etc. The scheme as depicted in the DPR has been finalized based on waste quantity & characteristics, techno-economic feasibility and also considering the local conditions. The Bidder is, however, free to carry out further process optimization or make suitable changes in the process as per the applicable guidelines/ rules and regulations with the objective of processing projected waste quantity.

1.1.5 MMC now invites Technical and Financial Proposal from the short listed bidders for implementation of the Project on PPP mode.

1.2 Two Stage bidding process

1.2.1 For selecting a party to undertake the above Project, MMC has planned to carryout a Two Stage bidding process, wherein there is a separate pre-qualification phase and the short-listed bidders who are qualified are being provided with the RFP document and are requested to submit Proposal in two parts, viz.:

Part 1 : Technical Proposal
Part 2 : Financial Proposal

The bid Security and fees for the RFP documents should be submitted along with the technical proposal.

All Bidders are required to submit their Proposal in accordance with the guidelines set forth in this RFP. In order to promote consistency among Proposals and minimize potential misunderstandings regarding how Bidders' Proposals will be interpreted by MMC, the format in which Bidders will specify the fundamental aspects of their Proposals has been broadly outlined in this RFP.

1.2.2 The evaluation of the Proposals would be carried out in two phases. The first phase would involve technical evaluation of the proposal as per the criteria mentioned in this document. There will a minimum qualifying score for the technical evaluation as per qualification criteria specified in Annexure 5A of this RFP. Based on technical evaluation, the Financial Proposal (Part 2) of only qualified bidders would be opened for selecting the Successful Bidder.

1.2.3 MMC will issue a Letter of Intent (LoI) to the Successful Bidder.

1.2.4 In this RFP, the term "Bidder" refers to all those qualified Applicants that have submitted Proposal in response to this RFP. "Developer" refers to the Successful Bidder selected by MMC to develop this Project.

1.2.5 MMC reserves the right not to follow up this RFP and terminate the entire selection process without any obligation to any of the Applicants / Bidders.

1.2.6 The terms used in this RFP and not defined herein shall have the meaning ascribed thereto in the Concession Agreement (the Part II of this RFP).

1.2.7 The principal contract between the MMC and the Developer will be the Concession Agreement, the draft of which is provided as Part II of this RFP. A prospective Bidder

having any comments on the Concession Agreement may notify MMC in writing. Bidders should send in their comments latest by the Last Date for Receiving Queries as given in the schedule of Bidding Process. Any comments on the Concession Agreement should be submitted in the format enclosed at Annex 7. However, it is not binding for MMC to accept any such comments. If there are any amendments to the Concession Agreement after the submission of Bids but before opening of the Financial Proposals, and if amendments likely to have financial implications in view of MMC, the qualified Bidders may be asked to submit revised Financial Proposal.

1.2.8 The MMC shall also enter into a Land Lease Agreement with the developer, the draft of which is placed at Part III of this RFP.

1.2.9 The Developer would be required to ensure compliance of the MSW (M &H) Rules, 2000 and other applicable environmental rules/legislations and guidelines required to be met for the project activities. Any default to the compliance requirements would be default on part of the Developer and could lead to termination of the Concession Agreement.

1.2.10 The confirmation and cross checking of the waste characteristics, land and other details provided shall be got done by the Bidders on its own.

1.2.11 Within 30 days from the issue of LoI, the Developer would be required to enter into the Concession Agreement with MMC. The Developer will also be required to submit a Performance Guarantee in favour of MMC (of the amount specified in Data Sheet) before signing the Concession Agreement.

1.3 Eligible Bidders

1.3.1 The Bidder who has been qualified in the RFQ stage are the eligible bidders. The term Bidder used hereinafter would therefore apply to both a single entity and a Consortium. The Bidder should submit a Power of Attorney as per the format enclosed at ***Annex 2A***, authorizing the signatory of the Proposal to commit the Bidder. In case the Bidder is a Consortium, it must comply with the additional requirements for Bidding as a Consortium as specified in Clause 1.4 of this RFP.

1.3.2 At any point of time in the Bidding Process, if required by MMC, it shall be the Bidders' responsibility to provide such evidence of their eligibility as per the terms of the RFP, to the satisfaction of MMC.

1.3.3 One company, single or Joint Venture firm shall not be eligible to submit more than one bid, either individually or as a member of a consortium for the same Project.

1.3.4 All Proposals must be submitted, duly signed by the Bidder (or a member authorized to sign the Proposal on behalf of the Consortium) under the "Covering Letter for Proposal Submission" the format for which is provided at ***Annex 1A*** of this RFP.

1.4 Additional requirements for Proposals submitted by a Consortium

1.4.1 In case the Bidder is a Consortium, the members of the Consortium shall furnish a Power of Attorney designating one of the members, as per the Memorandum of Understanding (MoU), as their Lead Member. A prescribed format for submitting the MoU along with the key Clauses that should be contained in the MoU is provided at Annex 2C. The authorized representatives of the members shall duly sign the Power of Attorney as per the format enclosed at Annex 2A. The Power of Attorney shall be furnished on a non-judicial stamp paper of Rs. 100/- duly attested by notary public.

Proposal submitted by a Consortium should comply with the following additional requirements:

i. Maximum number of members in a consortium would be limited to 3;
ii. Wherever required, the Proposal should contain the information required for each member of the Consortium;
iii. One of the Consortium members should have obtained the RFP document from MMC;
iv. The Proposal should include a description of the roles and responsibilities of individual members;
v. An individual member applying as a sole Bidder cannot at the same time be member of any Consortium applying for this Project. Further, a member of a particular Consortium cannot be member of any other Consortium applying for this Project. Any member who submits or participates in more than one Bid for this Project will be disqualified and will also lead to disqualification of the Consortium of which it is a member;
vi. Members of the Consortium shall nominate one member as the Lead Member. The nomination(s) shall be supported by a Power of Attorney as per the format enclosed at Annex 2B signed by all the members.

1.4.2 Members of the Consortium shall submit a Memorandum of Understanding (MoU) for the purpose of submitting the Proposal, as per format attached in Annex 2C. The Memorandum of Understanding (MoU) shall be furnished on a non-judicial stamp paper of Rs. 100/-, duly attested by notary public.
The MoU shall, inter alia:

(i) Convey the intent to acquire the shareholding of SPV formed already, with shareholding commitment(s) explicitly stated.
(ii) Any change in the shareholding commitments would not be allowed except in accordance with the provisions of the Concession Agreement and this RFP. The MoU shall communicate the willingness of the Consortium to subsequently carry out all the responsibilities as developer in terms of the Concession Agreement.
(iii) Clearly outline the proposed roles and responsibilities of each member at each stage and shall commit the minimum equity stake of each member as required under Clause 1.5 of this RFP.
(iv) Clearly state that members of the Consortium shall be liable jointly and severally for the execution of the Project in accordance with the terms of the Concession Agreement and a statement to this effect shall be included in the MoU.
(v) Should be accompanied by the Board Resolutions (in case of corporate members) and/ or undertakings (in case of individual members) of the Consortium, giving authority/ undertaking to enter into an MoU with other members for undertaking the Project and, if successful, to participate and undertake the Project and in case of corporate members nominating and authorizing an authorized representative of the member to sign and enter into the MoU and execute Power of Attorneys for the Project. The format for the Board Resolutions / Undertaking that must be submitted is provided at ***Annex 2D.***

1.4.3 A copy of the MoU duly notarized, should be submitted with the Proposal. The MoU entered into among the members of the Consortium should be specific to this Project and should contain the above requirements failing which the Application shall be rejected as non-responsive. The MoU should be governed by the laws, rules and regulations of India and should be subject to jurisdiction of Indian Courts only.

1.4.4 Any entity which has been barred by MMC/Govt of Tamilnadu from participating in any Projects (BOOT or otherwise) and the bar subsists as on the Proposal Due Date would not be eligible to submit the Proposal, either individually or as member of a Consortium. An Affidavit as per the format in Annex 2E should be submitted along with the Proposal.

1.4.5 The Proposal shall be signed by the duly authorized signatory of the Lead Member and shall be legally binding on all the members of the Consortium.

1.4.6 All witnesses and sureties shall be persons of status and probity and their full names, addresses and telephone numbers/mobile numbers shall be stated below their signature. All signatures in the Proposal documents shall be dated.

1.5 Incorporation of SPV and Minimum Equity Requirement

1.5.1 MMC is in the process of formulating a Special Purpose Vehicle for implementing the Project. The Selected Bidder will be required to acquire the entire equity of the SPV (SPV, a Company) for implementation of the Project.

1.5.2 The aggregate equity shareholding of the Consortium members/Sole Applicant (as applicable), in the issued and paid up capital of the SPV shall not be less than 76% (Seventy Six percent) during the Construction Period and for 10 years following Commercial Operations Date ('COD') and 51% (fifty one percent) during the balance remaining Operation Period.

1.5.3 Additionally, in case of a Consortium, the Lead Member would commit to hold a minimum equity stake equal to 51% of the aggregate shareholding of the Consortium in the SPV at all times during the Concession Period.

1.5.4 Any dilution in the equity holding of the SPV as provided in this clause shall be allowed only as per the provisions of the Concession Agreement.

1.6 Concession Period & Estimated Project Cost

The Concession Period and the Construction Period for the Project will be as per the Data Sheet.

The Total Project Cost (TPC) of the Project is provided at the Data Sheet

1.7 Change in Composition of the Bidder

In case a Bidder is a Consortium, change in the composition of the Bidder will not be permitted.

1.8 Proposal Preparation Cost

The Bidder shall be responsible for all costs associated with the preparation of its Proposal and its participation in the bidding process. MMC will not be responsible nor in any way liable for such costs, regardless of the conduct or outcome of the bidding process.

1.9 Contents of RFP

The RFP consists of Four Parts as listed below and would include any Addenda issued in accordance with Clause 1.11 of Part I of the RFP. The first three parts of the RFP Document would be provided to the interested bidders in hard form while the Part IV of the bid document which is the Detailed Project Report (DPR) of the project is to be downloaded from the MMC website namely www.Maduraicorporation.com

PART I	Request for Proposal
PART II	Draft Concession Agreement
PART III	Draft Land Lease Agreement
PART IV	Detailed Project Report (DPR) - To be downloaded from MMC website.

As Part IV of this RFP, a copy of the approved Detailed Project Report prepared by MMC that includes minimum specifications for this Project is also being made available to the Bidders through MMC's website.

1.10 Clarifications

1.10.1 A prospective Bidder requiring any clarification on the RFP may notify the MMC in writing. Bidders should send in their queries latest by the Last Date for Receiving Queries as given in the schedule of Bidding Process. The comments on the Concession Agreement should be notified in format enclosed at ***Annex 7*** only. However, it is not binding for MMC to answer/ accept any or all of such queries/comments. If there are any amendments to the Concession Agreement/RFP after the submission of Bids but before opening of the Financial Proposals, and such amendments likely to have financial implications in view of MMC, the qualified Bidders may be asked to submit revised Financial Proposal.

1.10.2 Copies of the response will be forwarded to all purchasers of the RFP, including a description of the enquiry.

1.11 Amendment of RFP

1.11.1 MMC may modify the RFP by issuing an Addendum before Proposal Due Date.

1.11.2 Any Addendum thus issued shall be part of the RFP and shall be communicated in writing to all the purchasers of the RFP and will also be hosted on the MMC's website. Bidders shall acknowledge receipt of each Addendum in writing to MMC. MMC will assume no responsibility for postal delays.

1.11.3 To give prospective Bidders reasonable time in which to take Addendum into account in preparing their bids, MMC may, at its sole discretion, extend the Proposal Due Date.

B. PREPARATION AND SUBMISSION OF PROPOSAL

1.12 Language of the Proposal

The language of Proposal and related documents and correspondence shall be as per the **Data Sheet**. Supporting documents and printed literature furnished by Bidder along with the Proposal may be in any other language provided that they are accompanied by translations in the language as per the Data Sheet and certified by the concerned Embassy/High Commission/Consulate of the country of origin of Bidder, in India. Supporting materials, which are not translated into the language mentioned in the Data Sheet, shall not be considered for evaluation. For the purpose of interpretation and evaluation of the application, translation certified by Embassy/ High Commission/Consulate shall prevail.

1.13 Currency of Proposal and Payments

1.13.1 The currency for the purpose of the Proposal shall be as per the Data Sheet. In case the conversion is required, the conversion to the currency mentioned in the Data Sheet shall be based on the exchange rate (RBI Reference Rate) as was applicable 7 days prior to Proposal Due Date. In all such cases, the original figures in the relevant foreign currency and the Proposal currency equivalent thereof must be given. The date used and exchange rate thereof shall be clearly stated. MMC reserves the right to use any other suitable exchange rate for the purposes of uniformly evaluating all Bidders.

1.14 Bid Security

1.14.1 Proposals would need to be accompanied by a Bid security in Indian Rupees for an amount as given in the Data Sheet and valid for 45 days beyond the Proposal validity. The bid security shall be kept valid through out the Proposal Validity Period including any extensions in the Proposal Validity Period as given in Clauses 1.15 and 1.16 and would be required to be extended and further extended if so required by MMC. Any extension of the validity of the Bid Security as requested by MMC shall be provided to MMC, a minimum of seven calendar days prior to the expiry of the validity of the Bid Security, being extended. When an extension of the Bid Validity Period is requested, Bidders shall not be permitted to change the terms and conditions of their Bids. MMC reserves the right to reject the Proposal submitted by any Bidder who fails to extend the validity of the Bid Security in line with the provisions of this clause.

1.14.2 The Bid Security shall be in the following form:
An irrevocable Bank Guarantee issued by a Bank in favour of MMC, as per the format set out in Annex 4A. For the purpose of providing Bid Security, the "Bank" shall have the meaning specified below and Bank Guarantees issued by the following Banks would be accepted:

I Banks

i. State Bank of India and its subsidiaries
ii. Any Indian Nationalized Bank
iii. Foreign Bank (issued by a branch outside India) with a counter guarantee from SBI or its subsidiaries or any Indian Nationalized Bank.
iv. Any scheduled Commercial Bank approved by RBI having a net worth of not less than Rs.50 crores as per the latest Annual Report of the Bank. In case of a Foreign Bank (issued by a branch in India), the net worth in respect of Indian operations shall only be taken into account.

II The acceptance of the guarantee shall also be subject to the following conditions

i. The capital adequacy of the Bank shall not be less than the norms prescribed by RBI
ii. The Bank Guarantee issued by a Cooperative Bank shall not be accepted

1.14.3 The Bid Security along with unopened Financial Proposal of those Bidders whose does not qualify the minimum requirements for technical evaluation will be returned within a period of 1 month from the date of intimation of such rejection. Notwithstanding anything contrary to anything provided in these instructions to Bidders, the validity of the Bid Security of the Successful Bidder, on issue of the Letter of Intent by MMC, should be extended by Developer, till the date on which the Concession Agreement is signed and is in force and Performance Guarantee is submitted (Format of Bank Guarantee enclosed at Schedule 8 of Concession Agreement, Part –II of bid document). The Bid Security of those bidders who have qualified the technical evaluation but unsuccessful in financial evaluation shall be returned, subject to the provisions of this clause, within a period of 2 months from the date of announcement of the Successful Bidder. Provided however, that the bid security of the second lowest Bidder as determined on the opening of the Financial Proposal shall be returned by MMC on the expiry of the Proposal Validity Period or the execution of the Concession Agreement, whichever is earlier. In addition to the above, MMC will promptly release all Bid Securities in the event MMC decides to terminate the bidding proceedings or abandon the Project.

1.14.4 MMC shall reject the Proposal, which does not include the Bid Security.

1.14.5 The entire Bid Security shall be forfeited in the following cases:

i. If the Bidder withdraws its Proposal except as provided in Clause 1.24;

ii. If the Bidder withdraws its Proposal during the interval between the Proposal Due Date and expiration of the Proposal Validity Period;

iii. If the Successful Bidder fails to submit the Performance Guarantee in favour of MMC and sign the Concession Agreement within the stipulated time.

1.15 Proposal Validity period

Proposal shall remain valid for a period not less than 6 months from the Proposal Due Date. MMC reserves the right to reject any Proposal, which does not meet the requirement.

1.16 Extension of Proposal Validity period

1.16.1 In exceptional circumstances, prior to expiry of the original Proposal Validity Period, MMC may request the Bidders to extend the period of validity for a specified additional period. The request and the Bidders' responses shall be made in writing. MMC reserves the right to reject the Proposal submitted by any Bidder who fails to extend the period of validity of its Proposal in line with the provisions of this clause.

1.16.2 The Bid Validity Period of the Successful Bidder shall be automatically extended till the date on which the Concession Agreement is signed and is in force.

1.17 Project Inspection and Site Visits

The Bidder(s), at their own responsibility and risk are encouraged to visit and examine the site of Project and its surroundings and obtain all information that may be necessary for preparing the Proposal. The costs of visiting the site shall be borne by the Bidder. MMC shall not be liable for such costs, regardless of the outcome of the Bidding process. Interested bidders may give prior intimation to MMC and get necessary permission for the visits.

1.18 Bidders' Responsibilities

1.18.1 The Bidder is expected to examine carefully the contents of all the documents provided. Failure to comply with the requirements of RFP will be at the Bidders' own risk.

1.18.2 It would be deemed that prior to the submission of the Proposal, the Bidder has:

i. Made a complete and careful examination of requirements and other information set forth in this RFP;

ii. Received all such relevant information as it has requested from MMC; and

iii Made a complete and careful examination of the various aspects of the Project including but not limited to:

a. The Project site(s)

b. Existing facilities and structures

c. The conditions of the access roads and utilities in the vicinity of the Project Site

d. Criteria for release of Funds under JNNURM

e. Ownership of facilities during and after the Term of Concession

f. Clearances obtained by MMC for the Project and

g. All other matters that might affect the Bidder's performance under the terms of this RFP.

h. Terms and conditions of the Concession Agreement

1.18.3 MMC shall not be liable for any mistake or error or neglect by the Bidder in respect of the above.

1.18.4 Each Bidder shall submit only one Proposal in response to this RFP. Submission of more than one Proposal by any Bidder shall be sufficient ground for disqualification of the Bidder. In case, any entity is part of more than one Bidder (either a sole Bidder or a Consortium), this shall lead to disqualification of all the Bidders in which such an entity is participating

1.19 Pre-Bid Conference

1.19.1 MMC proposes to hold a Pre-Bid Conference on the date specified in the Schedule of Bidding Process to discuss the issues related to the Project with all the Applicants. MMC on its discretion may also hold further discussions with the Applicants to finalise the technical/ commercial/ legal parameters and other related issues for the Project, before submission of the Proposals, which would be common for all the Applicants.

1.19.2 Prior to the Pre-Bid Conference, the Bidders may submit a list of queries and propose deviations, if any, to the Project requirements and/or the Concession Agreement. Bidders must formulate their queries/proposed deviations and forward the same to MMC before Last Date for Receiving Queries as specified in the Schedule of Bidding Process. MMC may amend the RFP based on inputs, provided by prospective Bidders that may be considered acceptable in its sole discretion.

1.19.3 MMC, at its sole discretion, may respond to inquiries submitted by the conference attendees after the date of the Pre-Bid Conference. Such a response will be sent in writing to all the Applicants who have been provided with the RFP document, and will qualify as an "Addendum" to the RFP.

1.19.4 Bidders may note that MMC will not entertain any deviations to the RFP at the time of submission of the Proposal or thereafter. The Proposal to be submitted by the Bidders shall be unconditional and the Bidders would be deemed to have accepted the terms and conditions of the RFP with all its contents and Addendums issued thereafter including the Concession Agreement. Any conditional Proposal shall be regarded as non-responsive and would be liable for rejection.

1.19.5 Attendance of Bidders at the Pre-Bid Conference is not mandatory.

1.19.6 All correspondence/ enquiry should be submitted to the following in writing by fax/ post/ courier:

The Superintending Engineer
Madurai Municipal Corporation (MMC)
Aringnar Anna Maaligai, Thallakulam
Madurai 625 002, TN, India
Telephone: 0452 –2530521-26
Facsimile: 0452 -2530965

1.19.7 No interpretation, revision, or other communication from MMC regarding this solicitation is valid unless in writing and signed by the competent authority from MMC, who are either The Superintending Engineer or the Commissioner.

1.20 Format and Signing of Proposal

1.20.1 The Bidder shall provide all the information as per this RFP. MMC reserves the right to evaluate only those Proposals that are received in the required format, complete in all respects and in line with the instructions contained in this RFP.

1.20.2 The Proposal should be submitted in Two Parts in 2 separate envelopes / packages and put together in one single outer envelope/package

Part 1: **Technical Proposal**" which will consist of the details mentioned in ***Annex 5B*** of this RFP.
Bid Security" which will be as per ***Annex 4A*** of this RFP. **Bid security & Fees for the RFP documents are not to be submitted in Hard Bound Form**

Part 2: **Financial Proposal**" which will consist of the details mentioned in ***Annex 6-A*** and ***6-B*** of this RFP.

1.20.3 The Bidder shall prepare and submit one original Proposal plus 2 copies of the same (for Technical Proposal and Bid Security) in a single envelope. However, for Financial Proposal, the Bidders need to submit only one original copy in a separate envelope.

1.20.4 The pages and volumes of each part of the Proposal shall be clearly numbered and stamped and the contents of the Proposal shall be duly indexed.

1.20.5 All documents should be submitted in a hard bound form, separately for Part 1& Part 2. Bid Security & Fees for RFP document are not to be submitted in hard bound form and should be placed with Technical Proposal in the same envelope. The Proposal should not include any loose papers.

1.20.6 The Proposal shall be typed or printed. The Proposal shall be signed and each page of the Proposal shall be initialed by a person or persons duly authorized to sign on behalf of the Bidder and holding the Power of Attorney as per the format provided in Annex 2A of this RFP.

1.20.7 The number(s) contained in the financial Proposal should be covered with a clear/transparent adhesive tape. Any signs of tampering will lead to the rejection of the financial Proposal.

1.20.8 The Proposal shall contain no alterations or additions, except those to comply with instructions issued by MMC or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialled by the person or persons signing the Proposal.

1.21 Sealing and Marking of Proposal

1.21.1 The Bidder shall seal each Part of the Proposal in separate envelopes duly marking each envelope as "TECHNICAL PROPOSAL" or "FINANCIAL PROPOSAL" as appropriate.

1.21.2 The Bidder shall put two separate envelopes enclosing the Proposal in a single outer envelope and seal the envelope.

1.21.3 The outer envelopes shall clearly bear the following identification.
"Construction and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility on PPP mode **in Madurai Corporation in the State of Tamilnadu"**

1.21.4 Each of the envelopes shall indicate the complete name, address, telephone number (with country and city code) and facsimile number of the Bidder.

1.21.5 Each envelope shall be addressed to:

The Superintending Engineer
Madurai Municipal Corporation (MMC)
Aringnar Anna Maaligai, Thallakulam
Madurai 625 002, TN, India
Telephone: 0452 –2530521-26
Facsimile: 0452 -2530965

1.21.6 MMC reserves the right to reject any Proposal which is not sealed and marked as instructed above and MMC will assume no responsibility for the misplacement or premature opening of the Proposal.

1.22 Proposal Due Date and Time

1.22.1 Proposal should be submitted before 1500 hours Indian Standard Time (IST), on the Proposal Due Date, as stated in the Schedule of Bidding Process, at the address given in Clause 1.21.5, in the manner and form as detailed in the RFP. Proposals submitted by either facsimile transmission or telex will not be accepted.

1.22.2 MMC may, in exceptional circumstances and at its sole discretion, extend the Proposal due Date by issuing an Addendum in accordance with Clause 1.11 uniformly for all Bidders.

1.23 Late Proposals

Any Proposal received by MMC after 1500 hours IST on the Proposal Due Date will not accepted by MMC.

1.24 Modifications / Substitution / Withdrawal of Proposals

1.24.1 A Bidder may modify, substitute, or withdraw its Proposal after submission, provided that written notice of the modification, substitution, or withdrawal is received by MMC, before or by the Proposal Due Date and Time. No Proposal shall be modified, substituted or withdrawn by the Bidder after the Proposal Due Date and Time.

1.24.2 The modification, substitution, or withdrawal notice shall be prepared in Original only and each page of the notice shall be stamped. The copy of the notice shall be sealed, marked, and delivered in accordance with Clause 1.21, with the envelope being additionally marked **"MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL"** as appropriate.

C. EVALUATION PROCESS

1.25 Proposal Opening Date

1.25.1 The Financial Proposals received by MMC will remain sealed and unopened in MMC's possession until the Technical Proposal has been tested for their responsiveness to RFP as per Clause 1.31 of this RFP.

1.25.2 MMC would open the Part 1 of Proposal (technical) at 1530 hours on the date mentioned against the Date for Submission of Proposals in the Schedule of Bidding Process or on the extended Date for Submission of Proposals. Financial Proposals shall not be opened at this stage.

1.25.3 Proposals for which an acceptable notice of withdrawal has been submitted in accordance with Clause 1.24 shall not be opened.

1.25.4 The Part 1 of Proposal shall be opened in the presence of Bidders' representatives, who choose to attend. Bidders' representatives attending the Proposal Opening shall register to evidence their presence.

1.25.5 The following information will be announced at the Proposal Opening and recorded:

- Bidder's names
- Names of Consortium Members

1.25.6 MMC would subsequently examine responsiveness of Proposals in accordance with the criteria set out in Clause 1.31.

1.25.7 After the Proposal Opening, information relating to the examination, clarification and evaluation of Bids and recommendations concerning the Bid Award shall not be disclosed except as underlined in this RFP.

1.26 Non-Discriminatory and Transparent Bidding Proceedings

1.26.1 MMC shall ensure that the rules for the bidding proceedings for the Project are applied in a non-discriminatory, transparent and objective manner. MMC shall not provide to any Applicant information with regard to the Project or the bidding proceedings, which may have the effect of restricting competition

1.27 Confidentiality

1.27.1 Information relating to the examination, clarification, evaluation, and recommendation for the Bidders shall not be disclosed to any person not officially concerned with the process. MMC will treat all information submitted as part of Proposal in confidence and would require all those who have access to such material to treat the same in confidence. MMC will not divulge any such information unless it is ordered to do so by any authority that has the power under law to require its disclosure.

1.28 Clarifications

1.28.1 To facilitate evaluation of Proposals, MMC may, at its sole discretion, seek clarifications in writing from any Bidder regarding its Proposal. Notwithstanding anything contained in the RFP, MMC reserves the right not to take into consideration any such clarifications sought by it for evaluation of the Proposal.

1.29 Bidding Criteria

1.29.1 The financial bids have to be submitted as per format provided Annexure 6-A and the criteria for evaluation has been detailed out in clause 1.33 and Annexure 5A.

1.30 Proposal Evaluation

1.30.1 The Concession will be awarded to the Bidder, who submits a responsive Bid, meets the minimum technical criteria for undertaking the Project and offers to enter into a Concession Contract on the best financial terms.

1.30.2 The Technical Proposals will undergo evaluation as per the criteria and process specified in Annex 5A of Part I of RFP and would be assigned a score. The bidders whose technical proposal meets the minimum threshold score shall be considered for financial evaluation. MMC reserve the right to reject the Proposals, which do not meet the technical parameters stipulated in the RFP.

1.30.3 After opening of financial proposal, a consolidated score will be worked for each proposal as detailed in Annexure 5 A. Once the evaluation is completed and a Developer is selected, any change in the variables, which form the basis of the bidders' financial bid will not affect the Concession terms except as provided in the Concession Agreement.

Proposals not accompanied by "Bid Security" shall not be evaluated.

1.31 Test of responsiveness

1.31.1 In Stage I of Proposal Evaluation, the Bid Security as stated in Clause 1.14 submitted by the Bidders shall be checked for compliance with the requirements. MMC will determine whether each Proposal is substantially responsive to the requirements of the RFP. A Proposal shall be considered responsive if the Proposal satisfies the criteria stated below:

The Proposal is:

a) Submitted with Fees for the RFP document as stipulated in Recital 13 of RFP (Page 7)

b) Submitted with Bid Security as stipulated in Clause 1.14
c) Is received by the Proposal Due Date including any extension thereof pursuant to Clause 1.22.
d) Is signed, sealed and marked as stipulated in Clauses 1.20 and 1.21.
e) Contains all the information in formats specified in this RFP.
f) Contains all the formats specified in this RFP as per details in the Data Sheet
g) Mentions the validity period of the Proposal as set out in Clause 1.15.
h) Provides the information in Reasonable Detail ("Reasonable Detail" means the details which but for minor deviations, contains the information, which can be reviewed and evaluated by MMC without communication with the Bidder). MMC reserves the right to determine whether the information has been provided in Reasonable Detail.

1.31.2 A Proposal that is substantially responsive is one that conforms to the preceding requirements without material deviation or reservation. A material deviation or reservation is one

i. Which affects in any substantial way the scope, quality, or performance of the Project, or
ii. Which limits in any substantial way, inconsistent with the RFP, rights of MMC or the obligations of the Bidder under the Concession Agreement, or
iii. Which would affect unfairly the competitive position of other Bidders presenting substantially responsive bids.

1.31.3 MMC reserves the right to reject any Proposal which is non-responsive and no request for alteration, modification, substitution or withdrawal shall be entertained by MMC in respect of such Proposals.

1.32 Evaluation of Technical Proposals (Phase I)

1.32.1 In Stage I of Proposal Evaluation, only those Proposals that are found to be responsive to the requirements of the RFP as specified in Clause 1.31 above would be opened for assessing their technical capabilities to undertake the Project as per ***Annex 5A.***

1.32.2 The technical capability of the Bidders would be assessed based on the evaluation process and minimum threshold requirements as set by MMC as per ***Annex 5A***, to be submitted by the Bidders in formats as per ***Annex 5B.***

1.32.3 Qualification & Technical Proposal is to judge the Bidder's capability and is proposed to be established by the Guidelines provided in ***Annexure 5A*** and Response Sheets in ***Annexure 5B.***

1.32.4 On all the specified parameters, the Bidder would be required to meet the evaluation criteria as detailed in ***Annex 5A***. Any Bidder meeting all the criteria will, subject to provisions of this document, will be qualified for evaluation of Financial Proposal.

1.32.5 Financial Proposals of those bidders whose Qualification & Technical Proposals meet the minimum technical capability requirements as set out in ***Annex 5A*** would be opened and evaluated.

1.32.6 Based on the evaluation of technical proposals, every Bidder would be assigned a Technical Score as per details given in ***Annex 5A***

1.33 Evaluation of Financial Proposals (Phase II) and Award of the Project

1.33.1 MMC will open Envelope 'FINANCIAL PROPOSAL' for the Bidders, who pass the Technical Evaluation stage (Phase I) as stated in clause 1.32, in the presence of the Bidder' representatives who choose to attend. MMC will endeavour to open the Financial Proposals

on the date mentioned against the Date for Opening of Financial Proposals in the Schedule of Bidding Process.

1.33.2 Based on the total Net Present Value (NPV) figure quoted in financial proposal (as per calculations detailed in Annexure 5-A), bidders will be assigned financial score and would be ranked in two groups; Group A will include those bidders offering Royalty and Group -B will include those seeking fees. Consolidation of financial scores with technical scores will be carried out separately for each group and the bidders ranked accordingly. The group-A will be provided preference and after examining their financial proposal along with their working sheets / calculations sheet, if the evaluation committee is satisfied with the estimates, then the committee may select a suitable bidder from that group.

1.33.3 In case the committee feels that the calculations among Group A proposals are not justifiable on a long-term basis, then they may take an appropriate decision to select a suitable bidder from among the bidders in Group-B. The evaluation committee reserves the right to make suitable decisions in the interest of the project and they are not bound to accept proposals purely on financial aspects.

1.33.5 Upon acceptance of the Financial proposal of the lowest bidder, MMC may declare the Successful Bidder.

1.34 Notification

The Successful Bidder would be notified in writing by MMC. MMC shall endeavour to issue the Letter of Intent (LOI) to the Successful Bidder by the date mentioned against issue of LOI in the Schedule of Bidding Process.

1.35 MMC's Right to accept or reject Proposal

1.35.1 MMC reserves the right to accept or reject any or all of the Proposals without assigning any reason and to take any measure as it may deem fit, including annulment of the bidding process, at any time prior to execution of the Concession Agreement, without liability or any obligation for such acceptance, rejection or annulment.

1.35.2 MMC reserves the right to invite fresh bids with or without amendment of the RFP at any stage without liability or any obligation for such invitation and without assigning any reason.

1.35.3 MMC reserves the right to reject any Proposal if:

(i) At any time, a material misrepresentation is made or uncovered for a bidder or any of its members

(ii) The Bidder does not respond promptly and thoroughly to requests for supplemental information required for the evaluation of the Proposal

This would lead to disqualification of the Bidder. If the Bidder is a Consortium, then the entire Consortium would be disqualified/ rejected. If such disqualification/ rejection occurs after the Financial Proposals have been opened and the Successful Bidder gets disqualified/ rejected, MMC reserves the right to take any such measure as may be deemed fit in the sole discretion of MMC, including annulment of the bidding process, inviting second preferred bidder for negotiation, inviting all qualified bidders for negotiations. Notwithstanding the above, MMC may debar / blacklist any of the Bidder(s) for their misleading or false representations in the forms, statements etc. for the period to be decided by MMC.

1.36 Acceptance of Letter of Intent (LOI)

1.36.1 Within fifteen (15) days from the date of issue of the LOI, the Successful Bidder shall accept the LOI and return the same to MMC. The Successful Bidder shall execute the Concession with MMC and also submit a Performance Guarantee in favour of MMC (of the amount specified in Data Sheet) within thirty- (30) days of acceptance of LOI.

1.36.2 In case, the Concession Agreement does not get executed within thirty- (30) days of acceptance of LOI and submission of Performance Guarantee, MMC reserves the right to invite any other suitable bidder for discussions/negotiations or may also decide to annul the bidding process or may invite fresh bids for the Project. Only acceptance of LOI without the Performance Guarantee shall not be considered as acceptance of LOI and in such a case the entire Bid security submitted by the Successful Bidder shall be forfeited. However, MMC on receiving request from the Successful Bidder may at its absolute discretion, permit extension of the aforesaid period of 30 days for execution of the Concession Agreement.

1.36.3 MMC will notify other Bidders that their Proposals have been unsuccessful. The Bid Security of second preferred Bidder shall be returned as mentioned in Clause 1.14.3. Bid Security of other bidders will be returned as promptly possible as, in any case not later then 2 months from the date of announcement of the Successful Bidder.

CONTENTS OF PROPOSAL

2.1 Main submission

Each Proposal shall include:

a) A Proposal for qualification in the prescribed formats (Annex 5B)
b) A financial Proposal in the prescribed format (Annex 6)

2.2 Other submissions

The other submissions shall consist of:

a) Covering letter clearly stating the validity period of the Proposal in the prescribed format Annex 1A.
b) Power of Attorney for signing the Proposal, as per the prescribed format Annex 2A.
c) Power of Attorney in favour of Lead Member, wherever required, as per the prescribed format Annex 2B.
d) Memorandum of Understanding (MoU), as per the prescribed format in Annex 2C wherever required.
e) Board Resolution, as per the prescribed format in Annex 2D
f) Affidavit, as per the prescribed format in Annex 2E
g) Anti-collusion certificate, as per the prescribed format Annex 3
h) Project Undertaking; as per the prescribed format annex 4B.
i) RFP documents and its annexures, each page duly stamped and signed by the authorized signatory (as per Power of Attorney)

1.3 Fees for RFP document, as per the Recital 13 of RFP on Page 7.

1.4 Bid Security, as per the prescribed format Annex 4A

1.5 The various formats given in Annexure are meant for specific purpose as indicated in table below and to be accordingly used/submitted:

ANNEX. NO.	CONTENTS	FORMAT APPLICABLE FOR
1A	Proposal Covering Letter Format	Technical Proposal
2A	Format for Power of Attorney for Signing of Proposal	Technical Proposal
2B	Format for Power of Attorney for Lead Member of Consortium	Technical Proposal
2C	Format for MoU	Technical Proposal
2D	Format for Board Resolution	Technical Proposal
2E	Format for Affidavit for Non Criminality	Technical Proposal
3	Format for Anti-Collusion Certificate	Technical Proposal
4A	Format for Bid Security	Bid Security
4B	Format for Project Undertaking	Technical Proposal
5A	Guidelines for evaluation of Technical & Financial Proposals	Only For Information
5B	Formats for Qualification Response sheets & Guidance for Technical Note	Technical Proposal
6A	Price Bid Format (Blank with XXXX in place of Figures)	Technical Proposal
6A	Duly filled up Price Bid Format	Financial Proposal
6B	Key Assumptions	Financial Proposal
7	Format for Comments on Draft Concession Agreement	Separately, Latest By Date Of Submission Of Queries
8	Term of Release of Capital Funds by MMC	Only For Information
	Data Sheet	Only For Information

ANNEX 1A

FORMAT FOR COVERING LETTER FOR PROPOSAL SUBMISSION

(On the Letterhead of the Bidder or Lead Member in case of a Consortium)

Date:

To
The Commissioner
Madurai Municipal Corporation (MMC)
Aringnar Anna Maaligai, Thallakulam
Madurai 625 002, TN, India
Telephone: 0452 –2530521-26
Facsimile: 0452 -2530965

Dear Sir,

Re: "Construction and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility in Madurai Corporation on PPP mode"

Being duly authorized to represent and act on behalf of Lead Member (in case of consortium)/Sole Applicant. I, the undersigned, having reviewed and fully understood all of the Proposal requirements and information provided hereby submit the Proposal for the Project referred above.

I am enclosing the Proposal (one original), with the details as per the requirements of this RFP, for your evaluation. The Proposal, including the Bid Security shall be valid for a period of Six (6) Months from the Proposal Due Date and the Bid Security shall be valid up to 45 days beyond the proposal validity period

Dated this ……Day of …….200_

Name of the Lead Member/Person

Signature of the Authorised Person

…….
Name of the Authorised Person

…….
Designation of the Authorised Person

ANNEX 2A

FORMAT FOR POWER OF ATTORNEY FOR SIGNING OF PROPOSAL

(On Non – judicial stamp paper of Rs. 100/- duly attested by a Notary Public)

POWER OF ATTORNEY

Know all men by these presents, we (name and address of the registered office of the Sole Applicant / Lead Member/ Member) do hereby constitute, appoint and authorize Mr. / Ms. ---------- R/o (name and address of residence) who is presently employed with us and holding the position of ---------- as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to the bid of the consortium consisting of , and (please state the name and address of the members of the consortium) for Development, construction, implementation, operation and maintenance of Waste Processing & Disposal facility at Madurai in the State of Tamilnadu on PPP Basis (the "Project"), including signing and submission of all documents and providing information / responses to MMC representing us in all matters in connection with our bid for the said Project.

We hereby agree to ratify all acts, deeds and things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

For (Signature)

(Name, Title and Address)

Accept

…….(Signature)

(Name, Title and Address of the Attorney)

Notes:

* To be executed by the Sole Applicant or all members including the Lead Member in case of a Consortium.
* The mode of execution of Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.
* Also, wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as a resolution / Power of attorney in favour of the Person executing this Power of Attorney for the delegation of power hereunder on behalf of the executant(s).

ANNEX 2B

FORMAT FOR POWER OF ATTORNEY FOR LEAD MEMBER OF CONSORTIUM

POWER OF ATTORNEY

(On Non – judicial stamp paper of Rs 100 duly attested by notary public)

Whereas the MMC has invited applications from the selected bidders based on RFQ for Development, design, engineering, finance, construction, implementation, operation and maintenance of Waste Processing & Disposal facility at Madurai in the State of Tamilnadu on PPP Basis (the "Project") for a specified Concession period (the "Concession Period").
Whereas, M/s ----------, M/s ----------, M/s ---------- and M/s ---------- (the respective names of the members along with address of their registered offices) have formed a Consortium and are interested in bidding for the Project and implementing the Project in accordance with the terms and conditions of the Request for Proposal (RFP), Concession Agreement and other connected documents in respect of the Project, and

Whereas, it is necessary under the RFP for the members of the Consortium to designate one of them as the Lead Member with all necessary power and authority to do for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium's bid for the Project or in the alternative to appoint one of them as the Lead Member who, acting jointly, would have all necessary power and authority to do all acts, deeds and things on behalf of the Consortium, as may be necessary in connection with the Consortium's bid for the Project.

NOW THIS POWER OF ATTORNEY WITNESSETH THAT:

We, M/s ----------, M/s ----------and M/s ---------- (the respective names of the members along with address of their registered offices) do hereby designate M/s ----------(name along with address of the registered office) being one of the members of the Consortium, as the Lead Member of the Consortium, to do on behalf of the Consortium, all or any of the acts, deed or things necessary or incidental to the Consortium's bid for the Project, including submission of Proposal, participating in conference, responding to queries, submission of information / documents and generally to represent the Consortium in all its dealings with MMC, any other Government Agency or any person, in connection with Project until culmination of the process of bidding and thereafter till the Concession Agreement is entered into with MMC

We hereby agree to ratify all acts, deeds and things lawfully done by Lead Member our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney.

Dated this day of 200_. Executant(s)]

(To be executed by all the members in the Consortium and accepted by the Lead Member)

Note:

- The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.
- Also wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as resolution/ Power of attorney in favour of the person executing this Power of attorney for the designation of power hereunder on behalf of the Bidder.

ANNEX 2C

FORMAT FOR MEMORANDUM OF UNDERSTANDING (MoU)

(On Non – judicial stamp paper of Rs 100 duly attested by notary public)

This Memorandum of Understanding (MoU) entered into this day of 200_ at

Among

_____ (hereinafter referred as"----------") and having office at India **Party of the First Part**

And

_____ (hereinafter referred as"----------") and having office at India **Party of the Second Part**

The parties are individually referred to as **Party** and collectively as **Parties.**

WHEREAS MMC has invited Technical and Financial Proposal from the selected bidders based on RFQ evaluation for Development, design, engineering, finance, construction, implementation, operation and maintenance of Waste Processing & Disposal facility at Madurai in the State of Tamilnadu on PPP Basis (the "Project") for a specified Concession Period (the "Concession Period").

AND WHEREAS The Parties have had discussions for formation of a Consortium for bidding for the said Project and have reached an understanding on the following points with respect to the Parties' rights and obligations towards each other and their working relationship.

IT IS HEREBY AS MUTUAL UNDERSTANDING OF THE PARTIES AGREED AND DECLARED AS FOLLOWS:

1. That the Parties shall acquire the entire equity of the Special Purpose vehicle (SPV) with the shareholding commitments expressly stated to domicile the Project prior to the start of implementation of the Project. The said SPV shall not undertake any other business during the Concession Period.
2. That the aggregate equity share holding of the Parties and their / his Associates, in the issued and paid up capital of the SPV shall not be less than 76% (Seventy Six percent) during the Construction Period and for 10 years following Commercial Operations Date ('COD') and 51% (Fifty One percent) during the balance remaining Operation Period..
3. That M/s _____ who is the Lead Members of the Consortium commits to hold a minimum equity stake equal to 51% of the aggregate shareholding of the Consortium in the SPV at all times during the Concession Period.
4. That any dilution in the equity holding by the Parties in the SPV shall be as per the provisions of the Concession Agreement.
5. That the shareholding commitments shall be recorded in the Concession agreement and no changes shall be allowed thereof, except in accordance with the provisions of the Concession agreement and the Request for Proposal.

6. That the Parties shall carry out all responsibilities as Concessionaire in terms of the Concession agreement.
7. That the roles and the responsibilities of each Party at each stage of the Bidding shall be as follows: …… ……
8. That the minimum equity holding of each Party (in percentage term) **in the SPV** shall be as follows:

   In Case of Consortium/ JV/ Sole Bidder -

   (76% during the Construction Period and for 10 years following Commercial Operations Date ('COD') and 51% (fifty one percent) during the balance remaining Operation Period.)

Name of the Consortium Members	**% of equity capital**
---	---
---	---
---	---

   In Case of Consortium/ JV

   (51% of the aggregate shareholding of the Consortium at all times during the Concession Period)

Name of the Lead Members	**% of equity capital**
---	---

9. That the Parties shall be jointly and severally liable for the execution of the Project in accordance with the terms of the Concession agreement.
10. That the Parties affirm that they shall implement the Project in good faith and shall take all necessary steps to see the Project through expeditiously. They shall not negotiate with any other party for this Project.
11. That this MoU shall be governed in accordance with the laws of India and courts in ----------shall have exclusive jurisdiction to adjudicate disputes arising from the terms herein.

In witness whereof the Parties affirm that the information provided is accurate and true and have caused this MoU to be duly executed on the date and year above mentioned.

…….	……..	…….	……
(Party of the first part)	(Party of the second part)	(Party of the third part)	(Party of the fourth part)

Witness:

1.

2.

ANNEX 2D

FORMAT FOR BOARD RESOLUTION FOR COMPANIES

Format for Lead Member

"RESOLVED THAT approval of the Board be and is hereby granted to join the consortium with and ---------- (name and address of the consortium members) for joint submission of bids to MMC for Development, design, engineering, finance, construction, implementation, operation and maintenance of Waste Processing & Disposal facility at Madurai in the State of Tamilnadu on PPP Basis (the "Project").

"RESOLVED FURTHER THAT the "draft" Memorandum of Understanding ("MoU) to be entered into with the consortium partners (a copy whereof duly initialled by the Chairman is tabled in the meeting) be and is hereby approved."

"RESOLVED FURTHER THAT Mr. ---------- (name),---------- (designation) be and is hereby authorised to enter into an MoU, on behalf of the company, with the consortium members and to sign the bidding documents on behalf of the consortium for submission of the bidding documents and execute a Power of Attorney in favour of ---------- to act as the Lead Member.

Format for Member

"RESOLVED THAT approval of the Board be and is hereby granted to join the consortium with ---------- , and ---------- (name and address of the consortium

members) for joint submission of bids to MMC for Development, design, engineering, finance, construction, implementation, operation and maintenance of Waste Processing & Disposal facility at Madurai in the State of Tamilnadu on PPP Basis (the "Project").

"RESOLVED FURTHER THAT the "draft" Memorandum of Understanding ("MoU) to be entered into with the consortium partners (a copy whereof duly initialled by the Chairman is tabled in the meeting) be and is hereby approved."

"RESOLVED FURTHER THAT Mr. ---------- (name), ---------- (designation) be and is hereby authorized to enter into an MoU with the consortium members and execute a power of attorney in favour of to act as the Lead Member"

ANNEX 2D (Continued)

FORMAT FOR UNDERTAKING FOR INDIVIDUAL MEMBERS/ FIRMS On the Letter-head of the Individual (In case the member is not a Company or where the Bidder is not a Company)

Format for Lead Member

I/We ---------- hereby agree to join the consortium with ----------, ---------- and ---------- (name and address of the consortium members) for joint submission of bids to MMC for Development, design, engineering, finance, construction, implementation, operation and maintenance of Waste Processing & Disposal facility at Madurai in the State of Tamilnadu on PPP Basis (the "Project").

I /We also approve the Memorandum of Understanding ("MoU) to be entered into with the consortium partners.

I/We also authorise Mr. ---------- (name), ---------- (designation) to enter into an MoU with the consortium members and to sign the bidding documents on behalf of the consortium for submission of the bidding documents.

Format for Member

I/We ---------- hereby agree to join the consortium with ----------, ---------- and ---------- (name and address of the consortium members) for joint submission of bids to MMC for construction, operation and maintenance of Waste Processing & Disposal facility at Madurai in the State of Tamilnadu on PPP Basis s (the "Project").

I /We also approve the Memorandum of Understanding ("MoU) to be entered into with the consortium partners

I/We also authorise Mr. ---------- ---------- (name),---------- (designation) to enter into an MoU with the consortium members and execute a Power of Attorney in favour of to act as the Lead Member"

Each applicant will have to attach its Board Resolution/ Undertaking as the case may be, approving the participation in the consortium, bidding for the Project and authorizing a company official to sign the bidding documents / Power of Attorney to the Lead Member.

ANNEX 2E

FORMAT FOR AFFIDAVIT FOR NON-CRIMINALITY

(In case of Consortium to be given separately by each member) (On Non – judicial stamp paper of Rs 100 duly attested by notary public)

1. I, the undersigned, do hereby certify that all the statements made in our proposal are true and correct.

2. The undersigned also hereby certifies that neither our firm M/s nor any of its directors/constituent partners have abandoned any work on Municipal Waste Management in India nor any contract awarded to us for such works have been terminated for reasons attributed to us, during last five years prior to the date of this application.

3. The undersigned also hereby certifies that neither our firm M/s……. nor any of our consortium partner namely M/s & M/s---------- have abandoned any contract/work of MMC or Govt. of Tamilnadu and or blacklisted by any State/Central Govt. agencies in participating from any bidding/tendering process.

4. The undersigned hereby authorize(s) and request(s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by MMC to verify this statement or regarding my (our) competence and general reputation.

5. The undersigned understands and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the MMC.

_____

Signed by an authorized Officer of the Co./firm

_____

Title of Officer

_____

Name of Co./Firm

_____

Date

ANNEX 3

FORMAT FOR ANTI-COLLUSION CERTIFICATE

(On the letter head of the Lead Member / Sole Applicant)

ANTI-COLLUSION CERTIFICATE

We hereby certify and confirm that in the preparation and submission of this Proposal, we have not acted in concert or in collusion with any other Bidder or other person(s) and also not done any act, deed or thing which is or could be regarded as anti-competitive.

We further confirm that we have not offered nor will offer any illegal gratification in cash or kind to any person or agency in connection with the instant Proposal.

Date this ……..Day of …….200_.
Name of the Bidder

Signature of the Authorised Person

Name of the Authorised Person

Note:

To be executed by lead member, in case of a Consortium

ANNEX 4 A

FORMAT FOR BID SECURITY

(To be issued by a Bank, as defined in Clause 1.14.2 of this RFP)

In consideration of the Madurai Municipal Corporation (hereinafter called "MMC" which expression shall include any entity which MMC may designate for the purpose) having agreed, interalia, to consider the bid of ……. (Hereinafter referred to the "Bidder" which expression shall include their respective successors and assigns) which will be furnished in accordance with the terms of the Request for Proposals for the Project/s (name of one or all the Projects, if bidding for more than one Project) envisaging …… (hereinafter called the "RFP") in lieu of the Bidder being required to make a cash deposit, we …….[name of the Bank and address of the issuing branch], hereinafter called the "Bank" which expression shall include our successors and assigns, as to bind ourselves our successors and assigns do at the instance of the Bidder hereby unconditionally and irrevocably undertake to pay as primary obligor and not as surety only to MMC without protest or demand and without any proof or condition the sum of Rs. …… Lakhs (in words), (Refer to Data Sheet).

1. We, the Bank, do hereby unconditionally and irrevocably undertake to pay forthwith (and in any event within five days) the amounts due and payable under this Guarantee without any delay or demur merely on a written demand from MMC stating that the amount claimed is due by reason of the occurrence of any of the events referred to in the RFP. Any such demand made on the Bank by MMC shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, the Bank's liability under 'this Guarantee shall be restricted to an amount not exceeding Rs …… Lakhs (in words), (Refer to Clause 1.14 and Data Sheet).

2. We, the Bank unconditionally undertake to pay to MMC any money so demanded under this Guarantee notwithstanding any dispute or disputes raised by the Bidder or any other party including in any suit or proceeding pending before any court or tribunal relating thereto or any instructions or purported instructions by the Bidder or any other party to the Bank not to pay or for any cause to withhold or defer payment to MMC under this Guarantee. The Bank's liability under this Guarantee is irrevocable, unconditional, absolute and unequivocal. The payment so made by the Bank under this Guarantee shall be a valid discharge of the bank's liability for payment hereunder and the Bidder shall have no claim against the Bank for making such payment.

3. We, the Bank further agree that the Guarantee herein contained shall remain in full force and effect upto and until 1700 hours on the date which falls 45 days beyond the Proposal Validity period i.e. …….(hereinafter called "the End Date"). Unless a demand or claim under this Guarantee is made on the Bank by MMC in writing on or before the said End Date the Bank shall be discharged from all liability under this Guarantee thereafter.

4. We, the Bank further agree with MMC that MMC shall have the fullest liberty without the Bank's consent and without affecting in any manner the Bank's obligation hereunder to vary any of the terms and conditions of the RFP or to extend or postpone the time of performance by the Bidder or any other party from time to time or postpone for any time or from time or postpone for any time or from time to time any of the powers exercisable by MMC against the Bidder or any of them and to enforce or to forbear from enforcing any of the terms and conditions relating to the RFP and the Bank shall not be relieved from it liability by reason or any forbearance act or

omission on the part of MMC, or any indulgence given by MMC To the Bidder or any other party or by any such matter or thing whatsoever which under the law relating to securities would, but for this provision, have the effect of so relieving the Bank.

5. To give full effect to the obligations herein contained, MMC shall be entitled to act against the Bank as primary obligor in respect of all claims subject of this Guarantee and it shall not be necessary for MMC to proceed against the Bidder or any other party before proceeding against the Bank under this Guarantee and the Guarantee herein contained shall be enforceable against the bank as principal obligor.

6. This Guarantee will not be discharged or affected in any way by the liquidation or winding up or dissolution or change of constitution or insolvency of any individual member of the Bidder or any other party or any change in the legal constitution or insolvency of the Bidder or any other party or any change in the legal constitution of the Bank or MMC.

7. We, the bank lastly undertake not to revoke this Guarantee during its currency except with the previous consent of MMC writing.

Notwithstanding anything contained herein.

a) Our liability under the Bank Guarantee shall not exceed …… Lakhs (in word), (Refer to Clause 1.14 and Data Sheet).
b) The Bank Guarantee shall be valid upto [date], 200_.
c) Unless acclaimed or a demand in writing is made upon us on or before ---------- all our liability under this guarantee shall cease.

IN WITNESS WHEREOF THE BANK HAS SET ITS HANDS HERETO ON THE DAY, MONTH AND YEAR MENTIONED HEREUNDER.

Signed and Delivered

On behalf of …….(Bank name) (Signature)
(Date)

by the hand of Mr ……
(name of authorized signatory)

Designation

Note: Authenticated copy of Letter of Authority authorizing the signatory of this guarantee to execute the same to be enclosed herewith)

ANNEX 4B

FORMAT FOR PROJECT UNDERTAKING

(On the Letterhead of the Sole Applicant/ Lead Member)

PROJECT UNDERTAKING

Date:

To

The Commissioner
Madurai Municipal Corporation (MMC)
Aringnar Anna Maaligai, Thallakulam
Madurai 625 002, TN, India
Telephone: 0452 –2530521-26
Facsimile: 0452 -2530965

Dear Sir,

Re: "Construction and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility in Madurai Corporation on PPP mode"

We have read and understood the Request for Proposal (RFP) in respect of the captioned Project provided to us by MMC.

We hereby agree and undertake as under:

1. We have no comments on the Concession Agreement and we agree to bind ourselves by the Concession Agreement provided as a part of the Bid Documents.
2. Any direct or indirect deviations from the terms of the Bid Documents, if any in our Proposal, are hereby revoked unconditionally.
3. Irrespective of the Technology used by us, it would be our responsibility to process the municipal waste of Madurai and adhere to the conditions specified in the Bid Documents.
4. If the Tender is awarded to us, we shall acquire the entire equity in the SPV for implementing the Project with minimum equity commitment as specified in RFP.
5. If the Tender is awarded to us, complete technical details of the Project will be submitted to MMC or its nominated representative for evaluation, before actual implementation of the Project.
6. The DPR provided by MMC, with the Bid Documents is only for indicative purpose and it is our responsibility to implement the project as per actual design parameters for the project.
7. MMC shall be obliged to provide segregated garbage to the Project site as per the segregation targets as mentioned in the concession agreement.
8. Notwithstanding any qualifications of conditions, whether implied or otherwise, contained in our Proposal we hereby represent and confirm that our Proposal is unqualified and unconditional in

all respects and we agree to the terms of the proposed Concession Agreement, a draft of which also forms a part of the RFP provided to

Dated this……..Day of ……..200_.
Name of the Bidder

Signature of the Authorised Person

Name of the Authorized Person

Note: To be signed by the Lead Member, in case of a Consortium, authorised to submit the bid

ANNEX 5A

GUIDELINES FOR EVALUATING TECHNICAL & FINANCIAL PROPOSALS

Evaluation of Technical Proposal

The Bidder (sole or consortium) shall submit their technical proposal clearly mentioning the following:

- Bidder's understanding of the project concept
- Bidders experience in implementing BOOT projects and success stories
- Bidders experience in implementing Infra-structure Projects
- Bidders experience in implementing MSW sector Projects
- Proposed approach, methodology for implementing the proposed project
- Detailed specifications of equipment to be used for this Project.
- Schedule for implementation of the proposed project
- Plans for marketing of products/tie-ups

The bidders will be evaluated against a total score of 100 by the evaluation committee. The distribution of score will be as follows:

CRITERIA	MARKS
Experience in BOOT Project	**20 Marks**
Experience in Infra-structure Project	**20 Marks**
Experience in MSW sector	**10 Marks**
Approach & Methodology for implementing this project	**20 Marks**
Details of Professionals	**10Marks**
Implementation schedule	**10 Marks**
Plan for sustainability of project covering marketing aspects or sale of products	**10 Marks**
TOTAL	**100 Marks**

Any Applicant who achieves a score of 75 and above against the total marks of 100 will be deemed to be qualified for the technical capability criteria (based on submissions as per guidelines in Response Sheet No 5.B.3 to the technical evaluation Committee) and are eligible for financial opening of the bids.

Evaluation of Financial Proposal:

The financial proposals of all the Technical qualified bidders will be opened. The financial Proposal shall essentially consist of three figures for every year during the term, as per format at **Annexure 6 A**. The figures include:

1. Royalty / Tipping fees per Ton of MSW for Processing & Disposal
2. Royalty / Fund requirement per year for maintenance activities related to development, construction, operation& maintenance of new landfill site and disposal of MSW from the existing dumpsite to new landfill of existing dumpsites

Additionally the format itself includes projected quantity of MSW for every year during the term. For the purpose of calculation following steps needs to be followed:

- For every year the figures quoted under column 4 to 7 of Annexure 6 A, should be multiplied with corresponding MSW qty i.e for processing of MSW, 75%[1] of yearly MSW quantity to be considered and for disposal into landfill a quantity of 25% of MSW to be considered for arriving at the yearly royalty or fee requirement while the bidder is encouraged to carryout maximum reuse/recycling.
- While calculating, the bidders shall assume positive sign for tipping fees and negative sign for royalty.
- The yearly figures shall be discounted at a rate of 11.1% per year to calculate NPV of all yearly figures in year 2008 and indicate sum total of the figure at the bottom of the sheet against "total NPV value". Bidder should consider appropriate signs while calculating yearly NPV values and total NPV value.

- The following steps are to be adopted for calculating the NPV:

  a. The bidders have to assume a discounting rate of 11.1 % during each year of the concession period. Based on the discounting rate, the discounting factor for each year may be calculated as follows:

  b. Discounting factor for any year (n) $= \dfrac{1}{(1+11.1\%)^{(n-1)}}$

  c. Using the above discounting factor, the Discounted price shall be calculated as below:

  - Discounted price for any year (n) $= \dfrac{\text{Estimated Price for the } n^{th} \text{ year}}{(1+11.1\%)^{(n-1)}}$

  d. Net Present Value $= \dfrac{\text{Sum of Discounted Price for every year of concession period}}{\text{Sum of Discounted factor for every year of concession period}}$

- The values in financial proposal shall be neatly typed and covered with a transparent adhesive tape. Any hand written financial proposal or with overwriting shall be liable for rejection.

Such total NPV value along with calculation sheet shall be provided by the bidders in the financial proposals and will be read out at the time of opening of financial proposal.

The bidder should clearly indicate whether the total NPV value refers to royalty (negative sign) or fees (positive sign) against the value. Based on above values the bidders will be grouped under Group A or Group B.

The financial score under each group will be calculated as below:

[1] The above values of 75% of MSW quantity & 25% of MSW quantity are to be used for calculation of royalty or tipping (on a yearly basis) to have a uniform calculation to arrive at the NPV values for comparing / evaluation of financial bids.

Group A – Applicable for Royalty

$$\text{Financial score of bidder} = \text{Total NPV value} \times \frac{100}{\text{Highest Total NPV value (absolute)}}$$

Group B – Applicable for Tipping Fees

$$\text{Financial score of bidder} = \text{Total NPV value} \times \frac{100}{\text{Lowest Total NPV value (absolute)}}$$

Ranking of bidders:

The consolidated scores of bidders under each group will be worked out for financial scores only. As per clause 1.33, the bidders will be ranked and suitable bidder would be invited for negotiations.

Bidders to note that the actual payment of royalty / fees would be based on the yearly fees / royalty quoted by them and the NPV value would be used only for comparison of the bids. The following points clarify it further:

1. The royalty payments to MMC or fees to selected bidder, whichever is applicable, would be based on the actual quantum of waste accepted at processing and or landfill site.
2. The payments towards the shifting of existing dumpsites & accommodating the same in forming new cells would be based on the actual quantum of work carried out in a month, duly certified by the project engineer and subject to a maximum of the amount estimated in the DPR for the said work.

QUALIFICATION RESPONSE SHEET NO. 5.B.1

FORMAT FOR EVIDENCE OF RESERVES / CASH FOR PARTICIPATION IN THE EQUITY CONTREIBUTION OF THE PROPOSED PROJECT

(On the letterhead of the Statutory Auditors of the firm)

This is to certify that M/s. ---------- is having unencumbered reserves and surpluses of Rs. ---------- in its accounts.

After reducing the future committed capital investments (till one month before the Proposal submission date), M/s ---------- will be having Rs. ---------- for investment in new Capital investments.

Signed

Name of Statutory Auditor

QUALIFICATION RESPONSE SHEET NO. 5.B.2

FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT FACILITIES / EQUITY PARTICIPATION IN THE PROPOSED PROJECT BANK / FINANCIAL INSTITUTION CERTIFICATE

(From any Scheduled Indian Bank or foreign bank or Financial Institution located in India and approved by Reserve Bank of India)

This is to certify that M/s. ---------- is a reputed company with a good financial standing.

If the contract for the work, namely is awarded to the above firm, we shall be able to provide credit facilities to the extent of Rs. ---------- to meet their capital requirements for equity participation in the Project (Name of the Project)

This certificate is issued with the approval of Head Office of the Bank / Financial Institution.

Signature

Name and Designation of the Competent Authority of the Bank / Financial Institution

Name, Address and Phone number of the Issuing Branch

Note: For the purpose of the certificate, Bank / Financial Institution will be defined as under:

1. State Bank of India and its subsidiaries
2. Any Indian Nationalized Bank
3. IDBI or ICICI Bank
4. Financial Institutions as approved by RBI
5. Investment Institutions (e.g. LIC, GIC etc.)
6. NBFC's approved by RBI and having a Net Worth of more then Rs 250 crores
7. Foreign Bank (issued by a branch outside India) with a counter guarantee from SBI or its subsidiaries or any Indian Nationalized Bank
8. Any scheduled Commercial Bank approved by RBI having a net worth of not less than Rs 500 crores as per the latest Annual Report of the Bank. In case of a Foreign Bank (issued by a branch in India), the net worth in respect of Indian operations shall only be taken into account.
9. The capital adequacy of the Bank shall not be less than the norms prescribed by RBI (10 since 31st March 2003)
10. The Bank Certificate issued by a Cooperative Bank shall not be accepted

QUALIFICATION RESPONSE SHEET NO. 5.B.3

Guidelines for Technical Note

Technical note should essentially consist of:

- Bidder's understanding of the project concept
- Bidders experience in implementing BOOT projects and success stories
- Bidders experience in implementing Infra-structure Projects
- Bidders experience in implementing MSW sector Projects
- Bidders Experience in operation and maintenance of composting facility
- Bidders Experience in construction, operation, maintenance and post closure monitoring of secured landfill
- Bidders Experience in handling fleet of heavy earthmoving equipments/HCV's for solid waste management operations
- Project Appreciations, Design Approach, O&M Plan & Methodology for implementing the proposed project
- Detailed specifications of equipment to be used for this Project.
- Schedule for implementation of the proposed project
- Plans for marketing of products/tie-ups

ANNEX 6 -A

(On the letterhead of the Lead Member)

"Construction and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility in Madurai Corporation" on PPP mode

Price Bid format

S. No.	Year	Projected waste Quantity T/Year	Processing of MSW Rs/ T		Disposal of waste into Sanitary Landfill, Rs/ T		Disposal of existing dumped MSW into separate cells of Landfill Rs/ Year		Yearly Royalty / Fees, Rs/ year	Discounting Factor	Discounted Yearly Royalty/ Fees, in Rs/year
			Royalty	Tipping fees	Royalty	Tipping fees	Tipping fees	Royalty			
1	2	3	4	5	6	7	8	9	10	11	12
1	2008	127750								1.00	
2	2009	134138								0.90	
3	2010	140844								0.81	
4	2011	147887								0.73	
5	2012	155281								0.66	
6	2013	163045								0.59	
7	2014	171197								0.53	
8	2015	179757								0.48	
9	2016	188745								0.43	
10	2017	198182								0.39	
11	2018	208091								0.35	
12	2019	218496								0.31	
13	2020	229421								0.28	
14	2021	240892								0.25	
15	2022	252936								0.23	
16	2023	265583								0.21	
17	2024	278862								0.19	
18	2025	292805								0.17	
19	2026	307446								0.15	
20	2027	322818								0.14	
Total NPV Value											

Bidder to note the following while filling-up the price bid:

- The price bid shall necessarily include the assumptions made by the bidder while arriving at the quoted financial offer.
- The bidder has to provide details of calculations made in arriving at this financial offer. The committee may examine the details provided and ask for additional information, if required.
- The Financial Proposal is to be signed by the authorized person of the Bidder (In case of a Consortium, as per a valid power of attorney given by all members of the Consortium)
- The bidder should quote value for each head i.e. processing & disposal and disposal of dumped MSW in landfill either royalty or fees. For e.g. if column 4 has value for any year, then column 5 for same year should be left blank. All blank columns shall be considered to have value equal to zero.
- The disposal of exiting dumped MSW into separate cells of Sanitary Landfill (in column 8 & 9) is to be completed within 2 years of Appointed Date. The royalty / tipping fee is to be quoted for initial two years only.
- While quoting the financial offer for landfilling the bidder has to keep in mind that the quantity of waste to be landfilled is different from the total waste quantity. For sake of uniformity and comparative evaluation of bids, the bidders have o consider 25% of yearly MSW quantity as the waste to be land filled and 75% of total MSW quantity as waste to be processed and eligible for the royalty/ tipping fee as quoted by them. The values in financial proposal shall be neatly typed and covered with a transparent adhesive tape. Any hand written financial proposal or with overwriting shall be liable for rejection.
- The quoted amount must include two places of decimals.
- It may be noted the actual payment of royalty or tipping fee during the operation of the project would be based on actual quantity of MSW received and processed and would be based on the figures for per T of waste quoted in the financial proposal of successful bidder. For land filling, only inert waste would be allowed as per MSW Rules, 2000.

ANNEX 6 – B KEY ASSUMPTIONS

"Construction and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility in Madurai Corporation" on PPP mode

Bidders would be required to submit information on key assumptions for the Project (Key Assumptions) based on their estimates of various parameters pertaining to the Project. Key Assumptions must include information on the following:

i. Project Cost Estimates
   - Base Construction Cost as on Proposal Due Date
   - Contingencies
   - Details of Preliminary Expenses
   - Details of Pre-Operative Expenses

ii. Estimated Total Project Cost as on COD

iii. Capital Structure
   - Debt-Equity Ratio
   - Equity capital
   - Debt funding
   - Quasi-equity, if any

iv. Terms of Debt and Quasi-equity
   - Interest Rate
   - Maturity

v. Economic Assumptions
   - Inflation Rate
   - Exchange Rate, if any

vi. O&M Cost Estimates
   - Routine Maintenance Costs as on Proposal Due Date
   - Periodic Maintenance Costs as on Proposal Due Date

vii. Other Costs and Charges
   - Establishment Cost
   - Depreciation Rates
   - Revenue Generation from sale of products/by-products

ix. Taxation Assumptions
   - Tax Rates
   - Tax Benefits

ANNEX 7

FORMAT FOR COMMENTS ON DRAFT CONCESSION AGREEMENT

Sr. No.	Clause No.	Present Form	Suggested Modification	Reason for Suggestion
1.				
2.				
3.				
4.				

ANNEX 8

TERMS OF RELEASE OF CAPITAL FUNDS BY MMC

During Project Implementation

During the project implementation, the concessionaire shall submit monthly bills for completed activities, which are included in the DPR approved under JNNURM scheme. These bills are to be certified by the Project Engineer (engaged as per terms of concession agreement) for release of 70% of the certified amount by MMC.

The total amount payable by MMC shall not exceed 70% of the approved project cost.

In case the bidder wishes to seek mobilisation advance, he is entitled to receive up to 10% of the total amount payable against submission of a bank guarantee of equivalent amount and initially valid for one year. This amount shall be adjusted during payment of monthly bills for completed activities by way of deducting 10% of the payable amount against each bill, till the value reaches the mobilisation advance released to the concessionaire. After such adjustments, the bank guarantee shall be discharged by MMC without any delay. However, in case, if the mobilisation advance is not fully adjusted within one year, a fresh bank guarantee of appropriate amount (reduced amount) shall be furnished by the concessionaire. In case, if the concessionaire fails to furnish such guarantee, MMC may adjust the pending advance against any payments due / to be due to the concessionaire.

DATA SHEET

Name of the Project:

"Construction and Maintenance of Integrated Municipal Solid Waste Processing and Disposal Facility in Madurai Corporation" on PPP mode

State: Tamilnadu

Recital	Annual Land Lease rental:	Rs. 1 per sq.m of land provided on lease by MMC
Para 1.6	Construction Period:	12 months
Para 1.8	Concession Period:	20 years after COD
Para 1.7	Estimated Project Cost of the Project as per DPR	Rs. 5730.43 Lakhs
Para 1.12	Language:	English
Para 1.13	Currency:	Indian Rupees (INR)
Para 1.14	Bid Security:	Rs. 40.0 Lacs
Para 1.14	Performance Guarantee:	Rs. 300.0 Lacs

SOILD WASTE MANAGEMENT PROJECT FOR MADURAI CITY MUNICIPAL CORPORATION

DETAILS OF PROJECT

Sr. No.	Item of Expenditure	Approved Budget dor the project (in Lakhs)	GoI contribution - 50% (in Lakhs)	State Govt Contribution, (in Lakhs)	Balance capital funds, (in Lakhs)
1	SLF for accumulated Waste, 13.2 Lakh m3	1736.02	868.01	347.204	520.806
2	Composting 300 TPD	947.95	473.975	189.59	284.385
3	Auxiliary facilities	854.12	427.06	170.824	256.236
	(Impervious yard, monsoon shed, finished compost storage, rain cover etc)				
4	SLF for new waste, 5 years, 5.4 Lakh tons	1301.29	650.645	260.258	390.387
5	Administrative facilities and utilities	891.05	445.525	178.21	267.315
		5730.43	**2865.215**	**1146.086**	**1719.129**

CONCESSION AGREEMENT

between

MADURAI MUNICIPAL CORPORATION

acting through
its authorized officer on this behalf

AND

_____
(CONCESSIONAIRE)

for

Development, Construction and Maintenance of an Integrated Municipal Solid Waste Processing and Disposal Facility for Madurai city

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ARTICLE	CONTENTS	PAGE

(To be printed on a Stamp Paper)

This Concession Agreement mutually agreed and entered into on this _____day of _____, Two Thousand and _____at Madurai,

BETWEEN

Madurai Municipal Corporation a municipal corporation established under the Madurai Municipal Corporation Act, 1971, and having its office at Madurai Municipal Corporation, Arignar Anna Maligai, Tallakulam, Madurai -625 002, acting through [ ] , the Commissioner (hereinafter referred to as "MMC", which expression shall, unless repugnant to the context or meaning thereof, mean and include its successors and assigns) of the ONE PART

AND

_____, a company incorporated under the Companies Act, 1956 and having its registered office at _____ (hereinafter referred to as "concessionaire", which expression shall, unless repugnant to the context or meaning thereof, mean and include its associate/group companies, successors and assigns) of the OTHER PART

MMC and concessionaire are hereinafter referred to individually as the **"Party"** and collectively as the **"Parties"**.

WHEREAS,

A. MMC is the municipal corporation for Madurai responsible for providing municipal and allied civic services, which encompasses the collection, transportation, processing and disposal of Municipal Solid Waste generated in the city. MMC currently disposes the collected Municipal Solid Waste at Vellakkal, Avaniyapuram on the south of Madurai by open dumping, which is, however, unscientific way of disposal of waste.

B. The Ministry of Environment and Forests (MoEF) under the aegis of Government of India (GoI), has formulated the Municipal Solid Wastes (Management and Handling) Rules 2000 ("MSW Rules"), which makes it mandatory for every civic body to implement a scientific solid waste management system through which Municipal Solid Waste is duly processed and

only the inorganic wastes and processing residues are disposed in an Engineered Sanitary Landfill (as hereinafter defined).

C. MMC desires for management of municipal solid waste in Madurai city. Project would comprise of development, construction, operation & maintenance of processing facility with compost plant and any other suitable processing plant(s) such as RDF, etc & development, construction, operation & maintenance of sanitary landfill facility including post closure monitoring through public-private participation.

D. MMC had, along with other agencies, carried out extensive project development work in connection with the Project (as hereinafter defined).

E. MMC had invited competitive proposals from eligible Bidders for implementing the Project and in response thereto MMC received proposals from several persons including the Concessionaire for implementing the Project.

F. MMC, after evaluating the aforesaid Proposals, accepted the Proposal submitted by the Concessionaire and issued Letter of Acceptance No. _____ dated _____ to the Concessionaire for developing the said Project.

G. The Parties hereto are required to enter into the Concession Agreement being these presents to record the terms, conditions and covenants of the Concession.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:-

ARTICLE 1

DEFINITIONS AND INTERPRETATION

1.1 Definitions

In this Agreement, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meaning hereinafter respectively ascribed to them hereunder:

"Access Road" mean the motorable approach road (30 ft. wide) for access to the Site from the main road and the intended route of which is indicated in green on the Site plan annexed as Schedule I hereto.

"Additional Cost" shall mean the additional capital expenditure and/or the additional operating costs or both as the case may be, which the Concessionaire would be required to incur as a result of Change in Law.

"Affected Party" shall mean the Party claiming to be affected by a Force Majeure Event in accordance with **Article 8.1**.

"Agreement" shall mean this agreement, including its schedules & annexure and includes any amendments made hereto in accordance with the provisions hereof.

"Applicable Law" shall mean all laws, acts, ordinances, rules, regulations, notification & guidelines in force and effect, including MSW Rules, as of the date hereof and which may be promulgated or brought into force and effect hereinafter in India including judgments, decrees, injunctions, writs or orders of any court of record, as may be in force and effect during the period of subsistence of this Agreement and applicable to the Project/the Concessionaire.

"Applicable -Approvals" shall mean all clearances, licenses, permits, authorisations, no objections, consents and approvals to be obtained or procured by the Concessionaire under Applicable Law, in connection with the construction, operation and maintenance of the Project during the period of subsistence of this Agreement.

"Appointed Date" shall mean the date of this Agreement.

"Arbitration Act" shall mean the Arbitration and Conciliation Act, 1996 of India and shall include any amendment to or any re-enactment thereof as in force from time to time.

"Assured Waste Quantity" shall mean the assured quantity of Municipal Solid Waste required and agreed to be supplied by MMC in accordance with **Article 6.1(b)**.

"Bio-medical Waste" shall have the meaning ascribed to it under the Biomedical Wastes (Management & Handling) Rules, 1998.

"Book Value" shall mean the cost of the fixed assets incurred by the Concessionaire for the Project, net of accumulated depreciation computed on straight line basis in accordance with the rates specified in Companies Act, 1956 and as determined by an independent firm of chartered accountants mutually agreed upon.

"C&D Debris and Silt Waste" means solid waste resulting from construction, remodelling, repair, renovation or demolition of Structures or from land clearing activities or trenching or de-silting activities. "Structures" for the purposes of this definition means buildings of all types (both residential and non-residential), utilities, infrastructure facilities and any other type of man-made structure. C&D debris include, but are not limited to bricks, concrete rubble and other masonry materials, soil, rock, wood (including painted, treated and coated wood and wood products), land clearing debris, wall coverings, plaster, drywall, plumbing fixtures, roofing, waterproofing material and other roof coverings, asphalt pavement, glass, plastics, paper, gypsum boards, electrical wiring and components containing no hazardous materials, pipes, steel, aluminium and other non-hazardous metals used in construction of structures.

"Change in Law" shall have the meaning ascribed thereto in **Article 8.4**.

"COD" or " Date of Commissioning" shall mean the Commercial Operations Date of the Project, which shall be the date on which the Project Engineer has issued the Readiness Certificate in accordance with the provisions of **Article 4.1**.

"Composting" shall mean a controlled process involving microbial decomposition of organic matter

"Concession" shall have the meaning ascribed thereto in **Article 2.1**.

"Concession Period" shall have the meaning ascribed thereto in **Article 2.3**.

"Concessionaire" shall mean party entering into this agreement to implement the project and includes its successors and permitted assigns expressly approved by MMC.

"Concessionaire's Associates" shall mean any company (ies) which is(are) controlled by the Concessionaire. For the purpose of this definition, the term "control" means the power to direct the management or policies of such entity, directly or indirectly, through the ownership of shares or other securities, by contract or otherwise, provided that the direct or indirect ownership of fifty one per cent (51%) or more of its voting share capital is deemed to constitute control of such entity, and "controlling" and "controlled" shall be construed accordingly.

"Construction Requirements" shall mean collectively the Waste Processing Facility Construction Requirements and the Landfill Facility Construction Requirements.

"Construction Works" shall mean all works and things required to be constructed by the Concessionaire, pursuant to the Construction Requirements and O&M Requirements.

"Contractor" shall mean any Person with whom the Concessionaire has entered into/may enter into any material contract in relation with the Construction Works and O&M Requirements.

"CPHEEO" shall mean Central Public Health & environmental engineering organisation under Ministry of urban Development, Government of India.

"Effective Date" is the date from which the concession agreement comes in force subsequent to satisfying all the requirements of conditions precedent as per **clause 2.6**

"Emergency" shall mean conditions or situation that is likely to endanger the safety of the individuals on or about the Project Facilities or which poses an immediate threat of material damage to any of the Project Facilities.

"Encumbrance" shall mean a legal right or interest in land that affects a good or clear title and diminishes the land value. It can be of numerous forms such as zoning ordinances, easement rights, claims, mortgage, charge, pledge, lien, hypothecation, security interest or other obligations and shall also include physical encumbrances, including utilities both under and above the ground and encroachments on the Site.

"Engineered Sanitary Landfill" shall mean the area of the Landfill Facility, designed with protective measures against pollution of ground water, surface water and air fugitive dust, wind blown litter, bad odour, fire hazard, bird menace, pests or rodents, greenhouse gas emissions, slope instability and erosion, and utilitised for disposal of Waste.

"Financing Documents" shall mean collectively the documents / loan agreements evidencing Lenders' commitment to finance the Project and shall include the security documents creating the relevant security (such as mortgages or charges or liens) on the Plant or any part thereof, for securing the debt provided.

"Financial Year" shall mean the period commencing from April 1 of any given year to March 31 of the succeeding year.

"Force Majeure" or **"Force Majeure Event"** shall mean an act, event, condition or occurrence as specified in **Article 8**.

"GoI" shall mean the Government of India.

"GoTN" shall mean the state Government of Tamil Nadu.

"Good Industry Practice" shall mean the exercise of that degree of skill, diligence, prudence and foresight in compliance with the undertakings and obligations under this Agreement which would reasonably and ordinarily be expected of a skilled and an experienced person engaged in the implementation, operation and maintenance or supervision or monitoring thereof of any of them of a project similar to that of the Project.

"Government Agency" shall mean GoI, GoTN, MMC or any state government or governmental department, commission, board, body, bureau, agency, authority, instrumentality, court or other judicial or administrative body, central, state, or local, having jurisdiction over the Concessionaire, the Site/Project Facilities or any portion thereof, or the performance of all or any of the services or obligations of the Concessionaire under or pursuant to this Agreement.

"Hand back of Project Facilities" shall have the meaning ascribed thereto in **Article 10**.

"Hazardous Waste" shall have the meaning as defined under the Hazardous Wastes (Management and Handling) Rules, 1989 and as amended thereto.

"Implementation Period" shall mean the period from the Effective Date to COD.

"Landfilling" shall **"means** the disposal of the Residual Inert Matter and Excluded Wastes at the Landfill Site in accordance with the terms of this Agreement.

"**Landfill Facility**" shall mean the existing landfill site for disposal of solid waste or the Engineered Sanitary Landfill to be duly designed, engineered, and constructed in accordance with the provisions specified thereto.

"Landfill Life" or **"Active Operations Period" of each cell of Sanitary Landfill** shall mean the period commencing from COD till the each cell of Engineered Sanitary Landfill is completely filled with Waste and a final cover designed in accordance with the MSW Rules is laid on the Engineered Sanitary Landfill, and in accordance with the provisions of this Agreement.

"Lenders" shall mean any person, financial institutions, banks, funds and trustees for bond holders or debenture holders, who have provided Loans to the Concessionaire for financing any part of the Project as evidenced in Financing documents.

"Land Lease Agreement" means the agreement pursuant to which site shall be leased out to the Concessionaire for setting up project facilities, the draft of which is provided as Schedule 4 to this Agreement.

"Manual" means manual on Municipal Solid Waste Management published by CPHEEO, Ministry of Urban Development.

"Material Adverse Effect" shall mean a material adverse effect on (a) the ability of the Concessionaire to exercise any of its rights to perform/discharge any of its duties/obligations under and in accordance with the provisions of this Agreement and/or (b) the legality, validity, binding nature or enforceability of this Agreement.

"Material Breach" shall mean a breach by either Party of any of its obligations under this Agreement which has or is likely to have a Material Adverse Effect on the Project and which such Party shall have failed to cure.

"MMC" shall mean Madurai Municipal Corporation, the municipal corporation established under the provisions of the Madurai Municipal Corporation Act, 1971.

"MSW Rules" shall mean the Municipal Solid Waste (Management and Handling) Rules, 2000 and includes any amendments thereto.

"Municipal Solid Waste" or **"MSW"** shall have the meaning as ascribed to it in the MSW Rules.

"MSW Supply Area" means the area under municipal jurisdiction of MMC and shall also include other municipal areas / jurisdictions as may be informed by MMC from time to time.

"MSW Quantity" means an aggregate of MSW per day, (with a permitted variation level of plus minus ten percent), which is the minimum quantity of MSW that to be delivered at the Receipt Point, in accordance with this Agreement.

"Maximum MSW Quantity" means MSW per day, which is the maximum quantity of MSW that the Plant can presently process and would mean any revised maximum increased capacity that is notified by Concessionaire during the Term.

"Monthly Fee" shall mean the amounts payable by MMC to Concessionaire in accordance with **Schedule 3**.

"O&M Requirements" shall mean the requirements as to operation and maintenance of the Project Facilities set forth in the bidding documents.

"Parties" shall mean the parties to this Agreement and "**Party"** shall mean either of them, as the context may admit or require.

"Performance Security" shall mean the guarantee for performance of its obligations to be procured by the Concessionaire in accordance with **Article 5.1**.

"Person" shall mean (unless otherwise specified or required by the context), any individual, company, corporation, partnership, joint venture, trust, unincorporated organisation, government or government body or any other legal entity.

"Post Closure Activities" shall mean the activities to be undertaken by the Concessionaire during the Post Closure Period in accordance with the provisions of MSW Rules, 2000 and the project DPR.

"Post Closure Period" shall mean the period commencing from the day immediately following the Active Operations Period and till fifteen years from the said day.

"Preliminary Notice" shall mean the notice of intended Termination by the Party entitled to terminate this Agreement to the other Party setting out, inter alia, the underlying Event of Default.

"Processing" shall mean the process by which Municipal Solid Waste is transformed into new or recycled products including processes like composting, vermin-composting, pelletisation, biomethanisation or any other suitable means as defined in the MSW Rules.

"Project" shall mean planning, designing, financing, construction, operation and maintenance of the Project Facilities in accordance with the provisions of this Agreement described as Development, Construction and Maintenance of an Integrated Municipal Solid Waste Processing and Disposal facilityProject comprising of, processing facility, Engineered Landfill Facility and its operation, maintenance, closure and post-closure monitoring during the concession period as well as Post Closure monitoring of landfill till the applicable period as per the provisions of MSW Rules, 2000 and Manual on MSW published by MoUD. The landfill facility has to be planned to have separate cells to accommodate mixed waste from the existing disposal site

"**Project Engineer**" shall be the City Engineer or any other engineer of the MMC as nominated by the Commissioner, MMC or a third Party as may be nominated/appointed by the Commissioner (Refer Article 4) who is the nodal person for supervision and monitoring of compliance by the Concessionaire with the Construction Requirements and O&M Requirements, more particularly to undertake, perform, carry out the duties, responsibilities, services and activities set forth in the bid documents consisting of this agreement, RFP and DPR on solid waste management.

"Project Facilities" shall mean the Site, together with the Waste Processing Facility, Landfill Facility and all other related facilities located thereon, and any other offsite facilities created for the Project.

"Readiness Certificate" shall mean the certificate issued by Project Engineer certifying, inter alia, that:

(i) the Concessionaire has constructed all the facilities within the Waste Processing Facility and the Landfill Facility so as to enable receipt of Municipal Solid Waste for Processing, Landfilling and mixed waste from the existing disposal site.
(ii) the Concessionaire has obtained all approvals necessary to receive the Municipal Solid Waste supplied by MMC.

"Residual Inert Matter" shall mean the waste matter obtained after processing of the MSW by each of the relevant Project Facilities.

"Rupees" or "Rs." refers to the lawful currency of the Republic of India.

"RDF" means the solid fuel in the form of fluff or pellets/briquettes that is produced by drying and separation of combustible fractions from the MSW meeting the requirements of the boiler to generate electricity through the turbine that will be part of the Power Plant.

"RDF Plant" means the Facility having a capacity to process of MSW, that will be constructed, operated and maintained as part of the Plant, for producing RDF from the MSW.

"Receipt Point" means the place(s) within the Site(s) for processing & disposal of waste, specified in writing and marked on a layout plan on or before the Date of Mechanical Completion, at which MMC shall be required to deliver the MSW in accordance with the terms of this Agreement.

"Rejected Waste" means such components of a consignment of Municipal Waste delivered by MMC that are refused either at the time of delivery or at any time thereafter, upon inspection of the MSW delivered or being delivered, as the case may be, they are either: (a) classified as Excluded Wastes, or (b) are of a composition that would be detrimental to the Operating Conditions or cause damage or adversely impact the efficient operation or maintenance of the Plant or any of the Project Facilities,(d) they are not in accordance with the composition of MSW as defined in this Agreement or (e) they are of a quantity that is either in excess of the MSW Quantity.

"SPCB" shall mean the State Pollution Control Board.

"Scheduled Project Completion Date" shall mean a maximum of 12 (twelve months) from the Appointed Date or COD, whichever is earlier.

"Site (s)" shall mean the land located at Vellakkal, Avaniyapuram on the south of Madurai for processing and disposal (more fully described in **Schedule 1**) identified and handed over to the Concessionaire, for the purpose of planning, designing, financing, constructing, operating and maintaining an integrated Waste Processing Facility and Landfill Facility during the Concession Period. Schedule 1 includes the area allocated for the construction of the above project facilities.

"Solid Waste" means wastes generated from commercial, agricultural, industrial and domestic activities that are in either solid or semi-solid form but shall not include the Excluded Wastes.

Supplementary Fuel" shall mean any fuel as a supplement to the MSW to enrich the RDF and/or to directly support the operation of Power Plant

"SPCB" means State Pollution Control board.

"Tax" shall mean and includes all taxes, fees, cess, duties & levies that may be payable by the Concessionaire under Applicable Law.

"Term" means the time period of 20 years commencing from the COD and will also include such successive time period/s by which the Concession granted in this Agreement may be renewed/extended as provided herein.

"Termination" shall mean early termination of this Agreement pursuant to Termination Notice or otherwise in accordance with the provisions of this Agreement but shall not, unless the context otherwise requires, include expiry of this Agreement due to efflux of time in the normal course.

"Termination Date" shall mean the date specified in the Termination Notice as the date on which Termination occurs / comes into effect.

"Termination Notice" shall mean the notice of Termination by either Party to the other Party, in accordance with the applicable provisions of this Agreement.

"Termination Payment" means the payments payable pursuant to **Clause 9.2(f)** of this Agreement.

"Tests" shall mean the tests to be carried out in accordance with the Construction Requirements or the O&M Requirements and generally conform to the nature of construction & operation as per standard practice.

1.2 Interpretation

(a) The words, phrases and expressions defined hereinabove in Clause 1.1 or defined elsewhere by description in this Agreement, together with their respective grammatical variations and cognate expressions shall carry the respective meanings assigned to them in the said Clause 1.1 or in this Agreement and shall be interpreted accordingly. Expressions which have not been defined in this Agreement shall carry the respective meanings assigned to them in their ordinary applicability read in context with the manner of their usage in this Agreement or in their respective technical sense, as the case may be;

(b) all words in singular shall be deemed to connote their respective plurals and vice-versa, unless the context suggests otherwise;

(c) the words "include" and "including" are to be construed without limitation;

(d) the headings of the Clauses in this Agreement are merely for purposes of convenience and shall have no bearing on the interpretation of this Agreement;

(e) the Schedules and Annexures to this Agreement form an integral part of this Agreement and shall be interpreted accordingly.

(f) any reference to any period commencing "from" a specified day or date and "till" or "until" a specified day or date shall include both such days or dates;

ARTICLE 2

CONCESSION

2.1 Grant of Concession

Subject to and in accordance with the terms and conditions set out in this Agreement, MMC hereby irrevocably grants to the concessionaire and the concessionaire hereby accepts exclusive right and authority, during the Term, to investigate, study, design, engineer, procure, finance, construct, operate and maintain the Project Facilities and to exercise and / or enjoy the rights, powers, benefits, privileges, authorizations and entitlements granted under this Agreement:

(a) to receive at the Receipt Point of Processing & disposal site, during each day of the Term, MSW from MMC (which shall be delivered by MMC at its own cost and expense) for the Project, to be transported and supplied by MMC, at the Receipt Points mainly and primarily from the MSW Supply Area.

(b) to inspect the MSW delivered by MMC and identify Rejected Waste as per provisions of Clause 5.7.1, in such manner as it deems fit, and refuse to accept the Rejected Waste

(c) to develop the sanitary landfill during the term of the project.

(d) to dispose the Residual Inert Matter to the Landfill Site

(e) to accommodate mixed waste from the existing disposal site at the new landfill site by making provision of separate cells at the landfill

(f) to receive all the fiscal incentives and benefits accruing in respect of or on account of the Project and also benefits from sale of by-products / recyclables.

2.2. Rights Associated with the Grant of Concession

Without prejudice to the generality of foregoing, the Concession hereby granted to the concessionaire shall include without being limited to, and shall entitle concessionaire, without requiring any further authorization or authority from MMC, to enjoy, the following rights, privileges and benefits in accordance with the provisions of this Agreement and Applicable Laws:

(a) to design, engineer, finance, procure, construct, install, commission, operate and maintain each of the Project Facilities either itself or through such Person as may be selected by it;

(b) up on commissioning of a Project Facility, to manage, operate and maintain the same either itself or through such Person as may be selected by it;

(c) to borrow or raise money or funding required for the due implementation of the Project and mortgage, charge or create lien or encumbrance on the whole or part of the Project Facilities;

(d) to use, appropriate, process MSW delivered by MMC to the project and dispose the Residual Inert Matter as per provisions of this Agreement

(e) to store, use, appropriate, market and sell or dispose all the products obtained after the processing and treatment of the MSW (including but not limited to electricity, methane, RDF, compost, Residual Inert Waste and recyclables) and to further retain and appropriate any revenues generated from the sale of such products.

(f) to obtain the utilities required for enabling the construction of the Project Facilities, without any additional cost or charges, other than the applicable user charges for the utilities

(g) exclusively hold, possess, control the Site (but not to own), in accordance with the terms of the Concession Agreement and Land Lease Agreement, for the purposes of the due implementation of this Project, in accordance with the terms of this Agreement

2.3 Concession Period

The Concession is granted to the concessionaire for the Term and shall terminate upon the expiry of the Term or upon earlier Termination of this Agreement.

2.4 Renewal of Concession

MMC may agree to renew or extend the Concession after the expiry of the initial Term, for another period of twenty - years or such other period as may be mutually agreed to and on such terms and conditions as mutually agreed upon. However any such extension shall be co-terminus with Land Lease Agreement.

2.5 Acceptance of Concession

In consideration of the rights, privileges and benefits conferred upon the Concessionaire, and other good and valuable consideration expressed herein, the Concessionaire hereby accepts the Concession and agrees and undertakes to perform / discharge all of its obligations in accordance with the provisions hereof.

2.6 Conditions Precedent

This Agreement and the Concession granted herein by MMC to concessionaire are valid and binding from the date of execution of this Agreement *provided however,* the obligations of concessionaire under this Agreement would become effective and binding, only upon the satisfaction of the following conditions precedent:

(a) MMC at its own cost and expense, vested with concessionaire the complete and lawful right, title and Vacant Possession of the Site, in accordance with the provisions of Land Lease Agreement, in a fully cleaned and leveled condition after undertaking all such developments and fillings as required for the purpose.
(b) Concession Agreement has been signed and became effective.
(c) MMC should have facilitated concessionaire to obtain all applicable approvals .
(d) All the Applicable Approvals required to enable the commencement of the Project and the commencement of the construction of the Project Facilities have been obtained by the relevant Party who is required to obtain the relevant Applicable Approval (details annexed at schedule 5).

2.7 Non-Compliance with Conditions Precedent

It is agreed that, if the above preconditions on part of either of the parties not met within six (6) months from the date of execution of this Agreement, then other party shall have the option of either: (i) extending the time period for satisfaction of the conditions precedent by another six (6) months or (ii) terminate this Agreement, in which event MMC shall pay to concessionaire, as a pre-agreed compensation for such default, the Development Costs duly certified by the statutory auditor of concessionaire.

2.8 Option with Concessionaire on Non-Satisfaction of Conditions Precedent

Without prejudice to the provisions of Clause 2.7, in the event the conditions precedent on the part of MMC, are not satisfied within six (6) months from the date of execution of this Agreement, then concessionaire shall, at its discretion, also have the right to waive the requirement of satisfaction of any of the unsatisfied conditions precedent and undertake to satisfy such conditions precedent itself, but at the cost and expense of MMC. In such circumstances, all costs and expenses that concessionaire may incur in the course of satisfying such conditions precedent shall be adjusted against any amount

payable by concessionaire to MMC, subject to duly certified by the statutory auditor of the company. MMC shall indemnify concessionaire against any liability that it may incur in the course of satisfying such conditions precedent.

ARTICLE 3

PROJECT SITE

3.1 Handover of Site

(a) MMC shall handover to the Concessionaire on vacant and peaceful physical possession of the site free from Encumbrance, for the purpose of implementing the Project.

(b) Upon the Site being handed over pursuant to the preceding sub-article (a), the Concessionaire shall, subject to the provisions of **Article 5**, have the right to enter upon, occupy and use the same and to make at its costs, charges and expenses such investigation, development and improvements in the Site as may be necessary or appropriate to implement the Project and provide the Project Facilities in accordance with the provisions of this Agreement.

3.2 Rights, Title and Use of the Site

(a) The Concessionaire shall have the right to the use of the Site in accordance with the provisions of this Agreement and for this purpose, it may regulate the entry into and use of the same by third parties.

(b) The Concessionaire shall not part with or create any Encumbrance on the whole or any part of the Project Facilities, including the Site save and except with the written consent of MMC.

(c) The Concessionaire shall not, without the prior written approval of MMC, use the Project Facilities for any purpose other than for the purpose of the Project and purposes incidental or ancillary thereto.

(d) The Concessionaire shall allow access to and use of the Site for laying / installing / maintaining telegraph lines, electric lines or for such other public purposes as MMC may specify. Provided that such access or use shall not result in a Material Adverse Effect and that MMC shall, in the event of any physical damage/shifting of the Project Facilities on account thereof, ensure that the Project Facilities are promptly restored at its cost and expenses.

(e) MMC will permit the project company to use the space available at the project facilities for display of advertisements as per applicable provisions and charge advertisement tax

3.3 Peaceful Possession

MMC hereby warrants that:

(a) The Site together with the necessary right of way/way-leaves

(i) has been acquired through the due process of law

(ii) belongs to and is vested in MMC

and that MMC has full powers to hold, dispose of and deal with the same consistent, interalia, with the provisions of this Agreement and that the Concessionaire shall, in respect of the Site, have no liability regarding any compensation payment on account of land acquisition or rehabilitation/resettlement of any Persons affected thereby.

(b) The Concessionaire shall, subject to complying with the terms and conditions of this Agreement, remain in peaceful possession and enjoyment of

- the whole Site during the Active Operations Period, and
- the area on which the Landfill Facility has been created during the Post Closure Period.

In the event the Concessionaire is obstructed by any Person claiming any right, title or interest in or over the Site or any part thereof or in the event of any enforcement action including any attachment, distraint, appointment of receiver or liquidator being initiated by any Person claiming to have any interest in/charge on the Site or any part thereof, MMC shall, as called upon by the Concessionaire, defend such claims and proceedings at its costs and also keep the Concessionaire indemnified against any consequential loss or damages which the Concessionaire may suffer, on account of any such right, title, interest or charge.

3.4 Applicable Permits

The Concessionaire shall obtain and maintain the Applicable Permits in such sequence as is consistent with the requirements of the Project. MMC shall provide all necessary co-operation / assistance for obtaining the permission. The Concessionaire shall be responsible and shall be in compliance with the terms and conditions subject to which Applicable Permits have been issued.

ARTICLE 4

PROJECT ENGINEER

4.1 Procedure for Appointment

(a) MMC shall nominate the either the city engineer or any other engineer of MMC or any other III Party as the Project Engineer within 7 days from appointed date hereof. The scope of nature of work of the Project Engineer is set out in schedule 6.

4.2 Replacement of the Project Engineer

MMC shall have the right to appoint / replace the Project Engineer, depending upon the requirement. If the concessionaire find that the Project Engineer is not meeting his performance obligations, he has the right to request the Commissioner, MMC in writing with details/reasons for his replacement. The Commissioner, MMC shall decide the need for replacement and if required may appoint/nominate a suitable engineer as Project Engineer.

ARTICLE 5

CONCESSIONAIRE'S OBLIGATIONS

In addition to and not in derogation or substitution of any of its other obligations under this Agreement, the Concessionaire shall have the following obligations:

5.1 Performance Bank Guarantee (PBG)

(a) The Concessionaire shall, for due and punctual performance of its obligations hereunder relating to the Project, deliver to MMC, simultaneously with the execution of this Agreement, a bank guarantee from a scheduled bank in the form as set out in **Schedule 7**, ("Performance Security") for a sum of **Rs. 3,00,00,000/- (Rupees Three Crores Only).**

(b) The PBG - shall be kept valid throughout the term of the agreement -. The renewal of the PBG as and when required is to be done by the concessionaire at least one month before the date of expiry of the existing PBG, failing which, MMC would be entitled to revoke the PBG.

Provided that if the Agreement is terminated due to any event other than a Concessionaire Event of Default, the PBG if subsisting as on the Termination Date shall, subject to MMC's right to receive amounts at prevailing time if any, due from the Concessionaire under this Agreement, be duly discharged and released to the Concessionaire within 30 days from the termination date.

5.2 Financing Arrangement

The project is eligible for grants under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) scheme of GoI to the maximum extent of 50% and 20% from State Govt amounting to 70% of estimated project capital cost. The Concessionaire shall at its cost, expenses and risk make financing arrangements for the balance of capital cost of the Project Facilities and to meet all of its obligations under this Agreement, in a timely manner.

The concessionaire shall make best endeavors - to obtain carbon credits for the project and the net revenue obtained (net of expenses) are to be shared in the ratio of 25% and 75% between MMC and the concessionaire.

5.3 Project Implementation: Construction of Project Facilities

(a) The Concessionaire shall adhere to the construction requirements as per the project DPR and shall adhere to the standards/ guidelines for construction as per BIS, MSW Rules 2000 and other applicable standards/ guidelines. .

(b) The Concessionaire may undertake Construction Works by itself or through a Contractor possessing requisite technical, financial and managerial expertise/capability; but in either case, the Concessionaire shall remain solely responsible to meet the Construction Requirements.

(c) The Concessionaire shall, before commencement of Construction of Project Facilities;

i) have requisite organization and designate and appoint suitable officers/ representatives as it may deem appropriate to supervise the Project, to interact with the Project Engineer/ MMC and to be responsible for all necessary exchange of information required pursuant to this Agreement;

ii) provide such facilities as may be required for the Project Engineer, at the Project Site during his visits.

(d) For the purposes of determining that Construction Works are being undertaken in accordance with the requirements, the Concessionaire shall with due diligence carry out all necessary and periodical Tests with advance intimation to the Project Engineer who either in person or through his representative may choose to be present during the conduct of such tests. The Concessionaire shall maintain proper record of such Tests and the remedial measures taken to cure the defects or deficiencies, if any, indicated by the Test results and keep the project engineer informed.

(e) All Tests shall be conducted in accordance with Construction Requirements. If the Tests are successful and the Project Facilities can be safely and reliably opened for operation, the Project Engineer shall issue Readiness Certificate.

(f) The Project shall be deemed to be complete and ready to receive Municipal Solid Waste only when the Readiness Certificate is issued by the Project Engineer in accordance with the provisions thereof.

Provided if COD is delayed beyond 90 days after the Scheduled Project Completion Date, MMC shall, subject to the provisions of **Article 9**, be entitled to terminate this Agreement and to appropriate the Performance Security

(g) The Concessionaire shall be deemed to be in material breach of O&M Requirements if the Project Engineer acting reasonably and in accordance with the provisions of this Agreement, has determined that due to breach of its obligations by the Concessionaire after providing just & fair opportunity to the concessionaire to explain it self;

(i) There has been failure/undue delay in carrying out scheduled/planned maintenance or the scheduled/planned maintenance has not been carried out in accordance with the O&M Requirements as evidenced by events of significance that resulted in prolonged interruptions of waste processing.

(ii) The maintenance of the Project Facilities or any part thereof has deteriorated to a level which is below the acceptance level prescribed by the O&M Requirements, required in line with the nature of activity.

(iii) There has been a serious or persistent let up in adhering to the O&M Requirements and thereby the Project Facilities or any part thereof is not safe for operations.

5.4 Insurance

The Concessionaire shall at its cost and expense, purchase and maintain by due re-instatement or otherwise, during the Concession Period all insurances in respect of the Project Facilities in accordance with the Good Industry Practice. The Concessionaire shall maintain a register of entry in order of premiums paid towards the Project Facilities and proof of payments made shall be submitted to MMC whenever requested for.

5.5 Application of Insurance Proceeds

Subject to the provisions of the Financing Documents and unless otherwise provided herein, the proceeds of all insurance policies received shall be promptly applied by the Concessionaire towards repair, renovation, restoration or re-instatement of the Project Facilities or any part thereof which may have been damaged or destroyed. The Concessionaire shall designate MMC as the beneficiary for the assets under ownership of MMC as per clause 10.1 and may designate the Lenders as the beneficiaries for the assets under the concessionaire's ownership as per clause 10.1 or assign the insurance policies in their favour as security for the financial assistance provided by them to the Project.

The Concessionaire shall carry out such repair, renovation, restoration or re-instatement to the extent possible in such manner that the Project Facilities after such repair, renovation, restoration or re-instatement be as far as possible in the same condition as it were prior to such damage or destruction, normal wear and tear excepted.

5.6 Environmental Compliance

The Concessionaire shall, at all times, ensure that all aspects of the Project Facilities and processes employed in the construction, operation and maintenance thereof shall conform with the laws pertaining to environment, health and safety aspects including rules such as MSW Rules, policies and guidelines related thereto. The Concessionaire shall obtain and maintain from time to time all necessary clearances from the Tamilnadu Pollution Control Board (TNPCB) or any other similarly empowered Government Agency and for this purpose shall carry out the necessary environmental impact assessment studies and implement appropriate environment management plans in respect of the Project Facilities.

The concessionaire shall be responsible for the development, construction, operation & maintenance of the project facilities as per the applicable laws, regulations, guidelines etc and ensure that there is no damage to the environment due the development and operation of the facilities. The concessionaire shall be liable to meet any expenses / compensation to be paid due to pollution/environmental damage or remediation caused by the development, operation and maintenance of the project facilities.

5.7 Land Use

The Concessionaire shall ensure optimum utilization of the Site(s) and shall not use the same for any purpose unconnected or which is not incidental to the Project or related activities, unless otherwise permitted under this agreement. However, it may be noted that the concessionaire shall not be allowed to construct any residential units / dwellings within the Site(s).

5.7.1 Weighing, Acceptance and Rejection of Municipal Solid Waste

(a) The Concessionaire shall weigh the Municipal Solid Waste at the receipt point of Processing site and also at entry gate to the landfilling area to weigh the inerts and rejects from processing prior to disposal of the same in the Sanitary Landfill in the manner as set out in the O&M Requirements.

(b) The Concessionaire hereby undertakes to accept all Municipal Solid Waste supplied by MMC as per provisions of Clause 6.1 (a) & (b) and except as provided under clauses (d) and (e) below.

(c) The Concessionaire also undertakes not to accept Municipal Solid Waste which is not supplied by either MMC or any Person appointed by it. The Concessionaire and MMC shall, within 3 months from the Effective Date, jointly agree upon a schedule for delivery of Municipal Solid Waste by MMC at the transfer station receipt points.

(d) In case the Municipal Solid Waste supplied by MMC contains Toxic & Hazardous Waste and/or Bio-medical Waste, the Concessionaire either on visual inspection during the Weighment stage or upon becoming aware of the same shall decline to accept such Non Municipal Solid Waste, and may cause the same to be unloaded in a separate area for inspection by the Project Engineer if already taken in to processing facility. In such case, the Project Engineer or his representative shall inspect and certify whether the particular lot of Municipal Solid Waste is fit for being accepted by the Concessionaire. In case the Project Engineer or his representative certifies that said Waste is not fit for

acceptance by the Concessionaire, MMC shall remove the same within 24 hours from the time of such confirmation, at MMC's cost and risk.

5.8 Sale/Distribution of Compost/manure & Energy and Other Recyclables

(a) The Concessionaire may adopt such processes and methods as it considers necessary or expedient for Processing of Municipal Solid Waste - at the Project Facilities, subject to meeting the Construction Requirements and O&M Requirements.
(b) The Concessionaire shall be free to sell or otherwise dispose of the recyclables, compost or organic manure, energy (power) and/ or other material recovered after Processing the Municipal Solid Waste, at the Project Facilities at such price and to such Persons and using such marketing and selling arrangements and strategies as it may deem appropriate subject to meeting the O&M Requirements.

5.9 Landfilling

(a) The Concessionaire shall carry out Landfilling, including carrying out of relevant Tests, in accordance with O&M Requirements. The Concessionaire shall weigh the Landfill Waste prior to disposal of the same in the Landfill Facility.
(b) The landfill facility has to be planned to have separate cells to accommodate mixed waste from the existing disposal site
(c) If during the Term of the Agreement, the available Site falls short of the actual Landfill requirements, then, the Concessionaire shall duly inform MMC of such additional land requirement for landfill at least one year prior to the exhaustion of existing land.

5.10 General Obligations

The Concessionaire shall at its own cost and expense-:

(a) investigate, study, design, construct/ renovate, operate and maintain the Project Facilities in accordance with the provisions hereof;
(b) obtain all Applicable Permits as required by or under the Applicable Law and be in compliance thereof at all times during the Concession Period;
(c) comply with Applicable Law governing the operations of Municipal Solid Waste processing units and engineered sanitary landfills at all times during the Concession Period;
(d) ensure and procure that any contract relating to the Project, entered into by the Concessionaire for implementing the Project in accordance with this Agreement contains provisions that would entitle Lenders or a nominee of MMC to step into such contract/s at MMC's discretion, in place and substitution of the Concessionaire.
(e) endeavour to sell or otherwise dispose off, without Landfilling, all recyclables in a manner which is not detrimental to the environment;
(f) endeavour to improve the ancillary conditions and infrastructure related to the Project including assistance to informal recycling workers,
(g) procure and maintain in full force and effect, as necessary, appropriate proprietary rights, licenses, agreements and permissions for materials, methods, processes and systems used in or incorporated into the Project;
(h) make efforts to maintain harmony and good industrial relations among the personnel employed in connection with the performance of its obligations under this Agreement and shall be solely responsible for compliance with all labour laws and solely liable for all possible claims and employment related liabilities of its staff employed in relation

with the Project and hereby indemnifies MMC against any claims, damages, expenses or losses in this regard and that in no case and shall for no purpose shall MMC be treated as employer in this regard;

(i) make its own arrangements for construction materials and observe and fulfil the environmental and other requirements under the Applicable Law and Applicable Permits;

(j) be responsible for all the health, security, environment and safety aspects of the Project at all times during the Concession Period.

(k) ensure that the Project Facilities remain free from all encroachments and take all steps necessary to remove encroachments, if any with the support/ assistance from MMC.

(l) upon receipt of a request thereof, afford access to the Project Facilities to the authorised representatives of MMC for the purpose of ascertaining compliance with the terms, covenants and conditions of this Agreement.

(m) pay all Taxes, duties and outgoings, including utility charges relating to the Project Facilities.

5.11 No Breach of Obligations

The Concessionaire shall not be considered to be in breach of its obligations under this Agreement nor shall it incur or suffer any liability if and to the extent performance of any of its obligations under this Agreement is affected by or on account of any of the following:

(a) Force Majeure Event, subject to Article 8.3;

(b) MMC Event of Default;

(c) Compliance with the written instructions of from MMC or the directions of any Government Agency other than instructions issued as a consequence of a breach by the Concessionaire of any of its obligations hereunder;

(d) Any repair or maintenance work being undertaken on one or more of the Project Facilities that requires suspension of the operations of the Plant.

(e) Closure of the Project Facilities or part thereof with the approval of the – MMC

(f) Orders of any court having competent jurisdiction

5.12 Maintenance of Records

The Concessionaire shall maintain records of the quantum (measured in tonnes) of waste supplied to the facility, waste processed, rejects disposed to the Landfill Facility, duly counter checked by the Project Engineer or his representative and provide monthly, quarterly and annual reports of the same to the Project Engineer and MMC along with any other details sought by Project engineer/MMC.

5.13 Shareholding Commitments

The aggregate equity shareholding of the Consortium members/Sole Applicant (as applicable), in the issued and paid up capital of the SPV shall not be less than 76% (Seventy Six percent) during the Construction Period and for 10 years following Commercial Operations Date (‘COD’) and 51% (fifty one percent) during the remaining term.

Additionally, in case of a Consortium, the Lead Member would commit to hold a minimum equity stake equal to 51% of the aggregate shareholding of the Consortium in the SPV at all times during the Concession Period.

ARTICLE 6

MMC's OBLIGATIONS

In addition to and not in derogation or substitution of any of its other obligations under this Agreement, MMC shall have the following obligations :

Specific Obligations

(a) After COD, MMC shall at its own cost, risk and expense, supply all MSW generated with in the limits of MMC to the specified Receipt Points(s).

(b) Starting from COD and immediate next year, the Minimum Waste Quantity (Mixed MSW + Segregated MSW) shall be 350 TPD. For subsequent years, MMC shall indicate to the Concessionaire, by end of 11th month (November, 20XX) of every year during the Term, the Minimum Waste Quantity that MMC shall be supplying daily at the Receipt Point(s) during the next year (January through December of 20XX + 1).

(c) MMC shall pay Tipping Fees to the Concessionaire, on a monthly basis equivalent to the amount calculated as per provisions of clause 7.1.

(d) MMC shall declare and maintain, or cause to declare and maintain, a no-development zone around the Site in accordance with Applicable Laws

(e) MMC shall endeavour not to supply construction debris, Bio-medical Waste and Hazardous Waste.

(f) MMC will endeavor to achieve and maintain the following targets for segregation of MSW:

- Within one year of COD - 50% or more
- Within two years of COD (After 1st year of operation) - 70% or more
- Within three years of COD - 80% or more
- Within four years of COD - 90% or more
- Within five years of COD - 100% or more

(g) MMC shall grant in a timely manner all such approvals, permissions and authorisations which the Concessionaire may require or is obliged to seek from MMC under this Agreement, in connection with implementation of the Project and the performance of its obligations. Provided where authorisation for availing permits for utilities such as power, water, sewerage, telecommunications or any other incidental services/utilities is required, the same shall be provided by MMC in the form as set out in **Schedule 10**, within fifteen days (15) - from receipt of request from the Concessionaire to make available such authorization, provided that the conditions that the applications / details submitted are complete and correct.

(h) MMC shall endeavour to assist the Concessionaire, wherever feasible, in obtaining finances from the financial institutions for the Project.

(i) MMC agrees, for the purposes of the Financing Documents, to intimate to the Lenders by such notice as required under the Financing Documents:

(a) of the happening or likely happening of an Event of Default on the part of MMC or concessionaire;

(b) of the termination of this Agreement by MMC or by concessionaire;

(c) of the occurrence, continuance and cessation of any force majeure cause;

(d) of any other breach or default on the part of concessionaire under this Agreement,

(j) If during the Term of the Agreement, the available Site falls short of the actual Landfill requirements, then, upon request from the Concessionaire for additional land and due

recommendation by the Project Engineer, MMC shall provide additional land for development of landfill adjacent to the site.

6.2 General Obligations

MMC shall :

(a) where appropriate provide necessary support to the Concessionaire in securing Applicable Permits;
(b) Observe and comply with all its obligations set forth in this Agreement.
(c) Ensure timely payments to the concessionaires

ARTICLE 7

FEE AND POST CLOSURE PAYMENTS

7.1 Fee

(a) Subject to the provisions of this Agreement and in consideration of the Concessionaire accepting the Concession and undertaking to perform and discharge its obligations in accordance with the terms, conditions and covenants set forth in this Agreement, MMC agrees and undertakes to pay to Concessionaire, a monthly Fee calculated in accordance with **schedule 3.**

(b) The Concessionaire shall weigh the Waste received at the Processing plant & disposal site - and get it duly certified by the Project Engineer or his representative in the manner as set out in the O&M Requirements. Only inert wastes are to be allowed for disposal into Sanitary Landfill Facility and the payment of tipping fee or receipt of royalty (as per the financial proposal of successful bidder) would be based on the values per T of waste processed or disposed as mentioned in the financial proposal of the successful bidder..

(c) The Concessionaire shall, on the 7th day of every Month or in case the 7th day of a Month is a holiday then on the following working day of such Month, submit to Project Engineer / MMC a statement ("Monthly Fee Statement") providing the details, in the manner as set out in **Schedule 3**.

7.2 Mechanism of Payment

7.2.1 Payments During Term of Concession

(a) Monthly payments: MMC shall, within 30 days from the date of receipt of the Monthly Fee Statement,

(i) Pay to the Concessionaire, an amount equal to 95% of the total amounts payable to Concessionaire in accordance with 7.1 as stated in such Monthly Fee Statement till two year prior to the end of the term of concession.

(ii) Pay to the Concessionaire, an amount equal to 90% of the total amounts payable to Concessionaire in accordance with 7.1 as stated in such Monthly Fee Statement for last two year of the term of concession.

(iii) Pay the remaining amounts equal to 5% of the total amounts during the initial years and 10% of the total amount during last two years of the term in a separate bank account named "Post Closure Performance account" for meeting the Post Closure Performance of landfill related expenses. The payment of such amount to the concessionaire shall be in accordance with clause (b) below.

(b) Payment from Post Closure Performance Account:

(i) At the end of every six months the amounts accumulated in the Post Closure Performance account shall be payable to Concessionaire against submission of a separate bank guarantee of equivalent amount that should be kept valid throughout the term of the concession. MMC shall ensure that such amount is paid to the concessionaire within 30 days of receipt of the requisite bank guarantee.

(ii) As this portion is to be retained for meeting the Post Closure Performance related expenses, the bank guarantees have to be kept valid throughout the term of the concession. In case, the concessionaire fails to renew any of the bank guarantees,

such guarantee would be encashed and the amount would be deposited in the "Post Closure Performance account."

(iii) The concessionaire shall have the option of submitting a single bank guarantee of requisite value in lieu of the bank guarantee (s) previously submitted by him.

7.2.2 Payments During Post closure Monitoring

(i) MMC shall not be liable to make any payments to the concessionaire during post-closure period.

(ii) The bank guarantee(s) subsisting with MMC as per clause 7.2.1 at the end of the term shall serve as protective measure to ensure that concessionaire binds by all his obligations during post closure period. Hence the bank guarantees need to be kept valid throughout the post closure period as well, however, the value of the same can be reduced at a rate of 5 % per year. To further clarify the amount that can be reduced every year shall be equal to 5% of the initial value of the Bank guarantee (value at the end of concession term). However, under no circumstances, the value of bank guarantees subsisting with MMC should fall below 25% of the initial value of bank guarantee.

(iii) It may be specifically noted that if any amount in post closure performance account is utilized as per provision of clause 10.3, then such amount shall be first adjusted before allowing yearly admissible reduction in the value of bank guarantee.

(iv) The remaining value of bank guarantees and amount accumulated in post closure performance account, if any, shall be promptly released by MMC within six months of issuance of post closure completion certificate by the Project Engineer.

7.3 Terms of Payment

a. Any delay in making payment in accordance with clause 7.2 above, -shall, without prejudice to any other consequences under this Agreement, entail payment of interest on the amount in default at prevailing annual prime lending rate of State Bank of India calculated for the duration of delay.

b. All payments to the Concessionaire shall be made by way of cheque by MMC. All payments to MMC shall be made by way of cheque payable at par or demand draft in favour of Commissioner, MMC payable at Madurai.

ARTICLE 8

FORCE MAJEURE

8.1 Force Majeure

As used in this Agreement, the expression "Force Majeure" or "Force Majeure: Event" shall mean occurrence in India of any or all of Non-Political Event, Indirect Political Event and Political Event, as defined in Clauses 8.2, 8.3 and 8.4 respectively, if it affects the performance by the Party claiming the benefit of Force Majeure (the "Affected Party") of its obligations under this Agreement and which act or event (i) is beyond the reasonable control of the Affected Party, and (ii) the Affected Party could not have prevented or overcome by exercise of due diligence and following Good Industry Practice, and (iii) has Material Adverse Effect on the Affected Party.

8.2 Non-Political Event

A Non-Political Event shall mean one or more of the following acts or events:

(a) act of God, epidemic, extremely adverse weather conditions, lightning, earthquake, landslide, cyclone, flood, volcanic eruption, chemical or radioactive contamination or ionising radiation, fire or explosion (to the extent of contamination or radiation or fire or explosion originating from a source external to the Site);

(b) strikes or boycotts (other than those involving the Concessionaire, Contractors, or their respective employees/representatives, or attributable to any act or omission of any of them) interrupting supplies and services to the Project for a continuous period of 24 (twenty four) hours and an aggregate period exceeding 7 (seven) days in an Accounting Year, and not being an Indirect Political Event set forth in Clause 8.3;

(c) any failure or delay of a Contractor but only to the extent caused by another Non-Political Event and which does not result in any offsetting compensation being payable to the Concessionaire by or on behalf of such Contractor;

(d) any judgment or order of any court competent jurisdiction or statutory authority made against the Concessionaire in any proceedings for reasons other than (i) failure of the Concessionaire to comply with any Applicable Law or Applicable Permit, or (ii) on account of breach of any Applicable Law or Applicable Permit or of any contract, or (iii) enforcement of this Agreement, or (iv) exercise of any of its rights under this Agreement by the Government;

(e) the discovery of geological conditions, toxic contamination or archaeological remains on the Site that could not reasonably have been expected to be discovered through a site inspection; or .

(f) any event or circumstances of a nature analogous to any of the foregoing.

8.3 Indirect Political Event

An Indirect Political Event shall mean one or more of the following acts or events:

(a) an act of war (whether declared or undeclared), invasion, armed conflict or act foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage;

(b) industry-wide or State-wide strikes or industrial action for a continuous period of 24 (twenty four) hours and exceeding an aggregate period of 7 (seven) days in an Accounting Year;

(c) any civil commotion, boycott or political agitation which prevents collection of Fee by the Concessionaire for an aggregate period exceeding 7 (seven) days in an Accounting Year;
(d) any failure or delay of a Contractor to the extent caused by any Indirect Political Event and which does not result in any offsetting compensation being payable to the Concessionaire by or on behalf of such Contractor;
(e) any Indirect Political Event that causes a Non-Political Event; or
(f) any event or circumstances of a nature analogous to any of the foregoing.

8.4 Political Event

A Political Event shall mean one or more of the following acts or events by or on account of any Government Instrumentality:

(a) Change in Law, only if consequences thereof cannot be dealt with under and in accordance with the provisions of the clause 8.12;
(b) compulsory acquisition in national interest or expropriation of any Project Assets or rights of the Concessionaire or of the Contractors;
(c) unlawful or unauthorized or without jurisdiction revocation of or refusal to renew or grant without valid cause, any clearance, licence, permit, authorization, no objection certificate, consent, approval or exemption required by the Concessionaire or any of the Contractors to perform their respective obligations under this Agreement and the Project Agreements; provided that such delay, modification, denial, refusal or revocation did not result from the Concessionaire's or any Contractor's inability or failure to comply with any condition relating to grant, maintenance or renewal of such clearance, licence, authorization, no objection certificate, exemption, consent, approval or permit;
(d) any failure or delay of a Contractor but only to the extent caused by another Political, Event and which does not result in any offsetting compensation being payable to the Concessionaire by or on behalf of such Contractor; or
(e) any event or circumstance of a nature analogous to any of the foregoing.

8.5 Duty to report Force Majeure Event

8.5.1 Upon occurrence of a Force Majeure Event, the Affected Party shall by notice report such occurrence to the other Party forthwith. Any notice pursuant hereto shall include full particulars of:

(a) the nature and extent of each Force Majeure Event which is the subject of any claim for relief under this Article 8 with evidence in support thereof; .
(b) the estimated duration and the effect or probable effect which such Force Majeure Event is having or will have on the Affected Party's performance of its obligations under this Agreement;
(c) The measures which the Affected Party is taking or proposes to take for alleviating the impact of such Force Majeure Event; and
(d) any other information relevant to the Affected Party's claim.

8.5.2 The Affected Party shall not be entitled to any relief for or in respect of a Force Majeure Event unless it shall have notified the other Party of the occurrence of the Force Majeure Event as soon as reasonably practicable, and in any event not later than 7 (seven) days after the Affected Party knew, or ought reasonably to have known, of its occurrence, and shall have given particulars of the: probable material effect that the Force Majeure Event is likely to have on the performance of its obligations under this Agreement

8.5.3 For so long as the Affected Party continues to claim to be materially affected by such Force Majeure Event, it shall provide the other Party with regular (and not less than weekly) reports containing information as required by Clause 8.5.1, and, such other information as the other Party may reasonably request the Affected Party to provide.

8.6 Effect of Force Majeure Event on the Concession

8.6.1 Upon the occurrence of any Force Majeure Event prior to the Appointed Date, the period set forth for achieving Financial Close shall be extended by a period equal in length to the duration of the Force Majeure Event.

8.6.2 At any time after the Appointed Date, if any Force Majeure Event occurs before COD, the Concession Period and the dates set forth in the Project Completion Schedule shall be extended by a period equal in length to the duration for which such Force Majeure Event subsists;

8.7 Allocation of costs arising out of Force Majeure

8.7.1 Upon occurrence of any Force Majeure Event prior to the Appointed Date, the Parties shall bear their respective costs and no Party shall be required to pay to the other Party any costs thereof.

8.7.2 Upon occurrence of a Force Majeure Event after the Appointed Date, the costs incurred and attributable to such event and directly relating to the Project the ; "Force Majeure Costs") shall be allocated and paid as follows:

(a) upon occurrence of a Non-Political Event, the Parties shall bear their respective Force Majeure Costs and neither Party shall be required to pay to the other Party any costs thereof;

(b) upon occurrence of an Indirect Political Event, all Force Majeure Costs' attributable to such Indirect Political Event, and not exceeding the Insurance Cover for such Indirect Political Event, shall be borne by the Concessionaire, and to the extent Force Majeure Costs exceed such Insurance Cover, one half of such excess amount shall be reimbursed by the MMC to the Concessionaire; and

(c) upon occurrence of a Political Event, all Force Majeure Costs attributable to such Political Event shall be reimbursed by the MMC to the Concessionaire.

For the avoidance of doubt, Force Majeure Costs may include interest payments on debt, O&M Expenses, any increase in the cost of Construction Works on account of inflation and all other costs directly attributable to the Force. Majeure Event, but shall not include loss of Fee revenues or debt repayment obligations, and for determining such costs, information contained in the Financial Package may be relied upon to the extent that such information is relevant.

8.7.3 Save and except as expressly provided in this Article 8, neither Party shall be liable in any manner whatsoever to the other Party in respect of any loss, damage, cost, Co expense, claims, demands and proceedings relating to or arising out of occurrence or existence of any Force Majeure Event or exercise of any right pursuant hereto.

8.8. Termination Notice for Force Majeure Event

If a Force Majeure Event subsists for a period of 180 (one hundred and eighty) days or more within a continuous period of 365 (three hundred and sixty five) days, either Party may in its discretion terminate this Agreement by issuing a Termination Notice to the other Party without being liable in any manner whatsoever, save, as provided In this Article 8, and upon issue of such Termination Notice,

this Agreement shall, notwithstanding anything to the contrary contained herein, stand terminated forthwith; provided that before issuing such Termination Notice, the Party intending to issue the Teffi1ination Notice shall inform the other Party of such intention and grant 15 (fifteen) days time to make a representation, and may after the expiry of such 15 (fifteen) days period, whether or not it is in receipt of such representation, in its sole discretion issue the Termination Notice.

8.9 Termination Payment for Force Majeure Event

8.9.1 If Termination is on account of a Non-Political Event, the MMC shall make a Termination Payment to the Concessionaire in an amount equal to 90% (ninety per cent) of the Debt Due less Insurance Cover for assets under concessionaire's ownership.

8.9.2 If Termination is on account of an Indirect Political Event, the MMC shall make a Termination Payment to the Concessionaire in an amount equal to:

(a) Debt Due less Insurance Cover for assets under concessionaire's ownership; provided that if any Insurance claims forming part of the Insurance Cover are not admitted and paid, then 80% (eighty per cent) of such unpaid claims shall be included in the computation of Debt Due; and

(b) 110% (one hundred and ten per cent) of the Adjusted Equity.

8.9.3 If Termination is on account of a Political Event, the MMC shall make a Termination Payment to the Concessionaire in an amount that would be payable under Clause 9.2 as if it were a MMC Default.

8.10 Dispute resolution.

In the event that the Parties are unable to agree in good faith about the occurrence or existence of a Force Majeure Event, such Dispute shall be finally settled in accordance with the Dispute Resolution Procedure; provided that the burden of proof as to the occurrence or existence of such Force Majeure Event shall be upon the Party claiming relief and/or excuse on account of such Force Majeure Event.

8.11 Excuse from performance of obligations

If the Affected Party is rendered wholly or partially unable to perform its obligations under this Agreement because of a Force Majeure Event, it shall be excused from performance of such of its obligations to the extent it is unable .to perform on account of such Force Majeure Event; provided that:

(a) the suspension of performance shall be of no greater scope and of no longer duration than is reasonably required by the Force Majeure Event;

(b) the affected party shall make all reasonable efforts to mitigate or limit damage to the other party arising our of or as a result of the existence or occurrence of such Force Majeure Event and to cure the same with due diligence; and

(c) when the Affected Party is able to resume performance of its obligations under this Agreement, it shall give to the other Party notice to that effect and shall promptly resume performance of its obligations hereunder.

8.12 Change in Law

(a) Change in Law shall mean the occurrence or coming into force of any of the following, after the Appointed Date:

(i) The enactment of any new Indian law;

(ii) The repeal, modification or re-enactment of any existing Indian law

(iii) A change in the interpretation or application of any Indian law by a court of record
(iv) Any order, decision or direction of a court of record.

Provided that Change in Law shall not include:

(i) Coming into effect, after the Appointed Date, of any provision or statute which is already in place as of the Appointed Date,
(ii) Any new law or any change in the existing law under the active consideration of or in the contemplation of any government as of the Appointed Date which is a matter of public knowledge,
(iii) Any change in the rates of the Taxes.

(b) Subject to Change in Law resulting in Material Adverse Effect and subject to the Concessionaire taking necessary measures to mitigate the impact or likely impact of Change in Law on the Project, if as a direct consequence of a Change in Law, the Concessionaire is obliged to incur Additional Costs, and MMC shall subsequently reimburse to the Concessionaire 50% of such Additional Costs, provided such additional cost in any manner as may be mutually agreed upon by parties.

(c) Upon occurrence of a Change in Law, the Concessionaire may, notify MMC/the Project Engineer of the following:
   (i) The nature and the impact of Change in Law on the Project
   (ii) In sufficient detail, the estimate of the Additional Cost likely to be incurred by the Concessionaire on account of Change in Law
   (iii) The measures, which the Concessionaire has taken or proposes to take to mitigate the impact of Change in Law, including in particular, minimising the Additional Cost
   (iv) The relief sought by the Concessionaire

(d) Upon receipt of the notice of Change in Law issued by the Concessionaire pursuant to preceding sub-clause, MMC and the Concessionaire shall along with the Project Engineer hold discussions and take all such steps as may be necessary including determination by the Project Engineer/MMC of the quantum of the Additional Cost to be borne and paid by MMC.

(e) MMC shall within 30 days from the date of determination of quantum of Additional Cost, provide relief to the Concessionaire in the manner as mutually agreed upon by the Parties.

ARTICLE 9

EVENTS OF DEFAULT AND TERMINATION

9.1 Events of Default

Event of Default shall mean either Concessionaire Event of Default or MMC Event of Default or both as the context may admit or require.

(a) Concessionaire Event of Default

Any of the following events shall constitute an Event of Default by the Concessionaire ("Concessionaire Event of Default") unless such event has occurred as a result of one or more reasons set out in **Article 5.11**:

(i) The Concessionaire has failed to achieve COD within 90 days after the Scheduled Project Completion Date for any reason whatsoever (delete);

(ii) The Concessionaire has failed to accept the Municipal Solid Waste supplied by MMC in accordance with **Article 5.7.1** for a continuous period of five days;

(iii) The Concessionaire has failed to make any payments due to MMC and more than 60 days have elapsed since such payment default;

(iv) The Concessionaire is in Material Breach of any of its obligations under this Agreement and the same has not been remedied for more than 60 days;

(v) A resolution for voluntary winding up has been passed by the shareholders of the concessionaire's company.

(b) MMC Event of Default

Any of the following events shall constitute an event of default by MMC ("MMC Event of Default"), when not caused by a Concessionaire Event of Default or Force Majeure Event:

(i) MMC is in Material Breach of any of its obligations under this Agreement and has failed to cure such breach within 60 (sixty) days of receipt of notice thereof issued by the Concessionaire;

(ii) MMC has unlawfully repudiated this Agreement or otherwise expressed its intention not to be bound by this Agreement;

9.2 Termination due to Event of Default

(a) Termination for Concessionaire Event of Default

(i) Without prejudice to any other right or remedy which MMC may have in respect thereof under this Agreement, upon the occurrence of a Concessionaire Event of Default, CMMC shall, subject to the provisions of the Substitution Agreement, be entitled to terminate this Agreement in the manner as set out under **Clause 9.2(a)(ii) and Clause 9.2(a)(iii)**.

Provided however that upon the occurrence of a Concessionaire Event of Default as specified under **Clause 9.1(a)(iii)**, MMC may terminate this Agreement by issue of Termination Notice in the manner set out under **Clause 9.2(c)**.

(ii) If MMC decides to terminate this Agreement pursuant to preceding **clause (i)**, it shall in the first instance issue Preliminary Notice to the Concessionaire. Within thirty (30) days of receipt of the Preliminary Notice, the Concessionaire shall submit to MMC in sufficient detail and if applicable the manner in which interalia it proposes to cure the underlying Event of Default (the "Concessionaire's Proposal to Rectify").The same shall be reasonably considered by MMC . In case of non-submission of the Concessionaire's

Proposal to Rectify within the said period of 30 days, MMC shall be entitled to terminate this Agreement by issuing Termination Notice, and to appropriate the Performance Security, if subsisting.

(iii) In case the Concessionaire has made a Proposal to rectify is submitted within the period stipulated therefore, the Concessionaire shall have further period of 60 days to remedy/ cure the underlying Event of Default. If, however the Concessionaire fails to remedy/ cure the underlying Event of Default within such further period allowed, MMC shall be entitled to terminate this Agreement, by issue of Termination Notice and to appropriate the Performance Security, if subsisting.

(b) Termination for MMC Event of Default

(i) Without prejudice to any other right or remedy which the Concessionaire may have in respect thereof under this Agreement, upon the occurrence of MMC Event of Default, the Concessionaire shall be entitled to terminate this Agreement by issuing Termination Notice.

(ii) If the Concessionaire decides to terminate this Agreement pursuant to preceding clause (i) it shall in the first instance issue Preliminary Notice to MMC. Within 30 days of receipt of Preliminary Notice, if applicable ,MMC shall forward to the Concessionaire its proposal to remedy/ cure the underlying Event of Default (the "MMC Proposal to Rectify"). In case of non submission of MMC Proposal to Rectify within the period stipulated therefore, Concessionaire shall be entitled to terminate this Agreement by issuing Termination Notice.

(iii) In case MMC Proposal to Rectify is forwarded to the Concessionaire within the period stipulated therefore, MMC shall have further period of 45 days to remedy/ cure the underlying Event of Default. If, however MMC fails to remedy/ cure the underlying Event of Default within such further period allowed, the Concessionaire shall be entitled to terminate this Agreement by issuing Termination Notice.

(c) Termination Notice

If a Party having become entitled to do so decides to terminate this Agreement pursuant to the preceding sub article (a) or (b), it shall issue Termination Notice setting out:

(i) in sufficient detail the underlying Event of Default;

(ii) the Termination Date which shall be a date occurring not earlier than 90 days from the date of Termination Notice;

(iii) the estimated termination payment including the details of computation thereof; and,

(iv) any other relevant information.

(d) Obligation of Parties

Following issue of Termination Notice by either Party, the Parties shall promptly take all such steps as may be necessary or required to ensure that;

(i) until Termination the Parties shall, to the fullest extent possible, discharge their respective obligations so as to maintain the continued operation of the Project Facilities;

(ii) the termination payment, if any, payable by MMC in accordance with the following **sub - article (f)** is paid to the Concessionaire on the Termination Date; and

(iv) the Project Facilities are handed back to MMC and Lenders as per provision of clause ---------- by the Concessionaire on the Termination Date free from any Encumbrance along with any payment that may be due by the Concessionaire to MMC.

(e) Withdrawal of Termination Notice

Notwithstanding anything inconsistency contained in this Agreement, if the Party who has been served with the Termination Notice cures the underlying Event of Default to the satisfaction of the other Party at any time before the actual Termination occurs, the Termination Notice shall be withdrawn by the Party which had issued the same.

Provided that the Party in breach shall compensate the other Party for any direct costs/consequences occasioned by the Event of Default which caused the issue of Termination Notice or as mutually agreed upon by both parties.

(f) Termination Payments

Upon Termination of this Agreement on account of MMC Event of Default, the Concessionaire shall be entitled to the following termination payments in addition to payment from MMC that may have accrued to concessionaire prior to the Termination:

(a) if the termination occurs prior to the COD, then MMC shall pay concessionaire a termination payment calculated as below:
Termination payment = Debt due + 120% of equity contribution by the concessionaire till termination date

(b) if the termination occurs after COD, then MMC shall pay concessionaire termination payment equal to the following:
- Termination payment = Debt due + 150% of adjusted Value of the equity on Termination Date.

(i) Upon Termination of this Agreement on account of concessionaire Event of Default, MMC shall be liable to pay Termination Payment to concessionaire, to the extent of the following:
- Only the debt due as on date of termination (not the adjusted equity)

9.3 Rights of MMC on Termination

(a) Upon Termination of this Agreement for any reason whatsoever, MMC shall upon making the Termination Payment, if any, to the Concessionaire and in accordance with the provisions of the financing documents have the power and authority to:

(i) enter upon and take possession and control of the Project Facilities forthwith free from any encumbrances;

(ii) prohibit the Concessionaire and any person claiming through or under the Concessionaire from entering upon/ dealing with the Project Facilities or permit as required for pending resolution of any issues to a limited number of representatives of concessionaire.

(b) Notwithstanding anything contained in this Agreement, MMC shall not, as a consequence of Termination or otherwise, have any obligation whatsoever including but not limited to obligations as to compensation for loss of employment, continuance or regularisation of employment, absorption or re-employment on any ground, in relation to any person in the employment of or engaged by the Concessionaire in connection with the Project, and the handover of the Project Facilities by the Concessionaire to MMC shall be free from any such obligation.

9.4 Accrued Rights of Parties

Notwithstanding anything to the contrary contained in this Agreement, Termination pursuant to any of the provisions of this Agreement shall be without prejudice to accrued rights of either Party including its right to claim and recover money damages and other rights and remedies which it may have in law or contract. The rights and obligations of either Party under this Agreement, including without

limitation those relating to the Termination Payment, shall survive the Termination but only to the extent such survival is necessary for giving effect to such rights and obligations.

ARTICLE 10

HANDOVER OF PROJECT FACILITIES

10.1 Ownership during the term of concession

Without prejudice and subject to the Concession, the ownership of the Project Facilities, including all improvements made therein by the Concessionaire, during the term of the concession shall at all times remain as mentioned below:

(a) that of all immovable assets including site and civil structures thereon shall remain with MMC

(b) that of all movable assets including equipments & machinery and vehicles shall remain with the concessionaire and in accordance with the financing documents and first prior charge to Lenders privileges.

10.2 Concessionaire's Obligations

(a) Waste Processing Facility

(i) The Concessionaire shall on the date of expiry of the agreement term , hand back peaceful possession of the Waste Processing Facility to MMC free of cost and in normal operating condition.

(ii) At least 12 months before the expiry of the term of agreement a joint inspection of the Project Facilities shall be undertaken by Project Engineer/MMC and the Concessionaire. The Concessionaire shall promptly undertake and complete such works/jobs as may be required by MMC at least three months prior to the expiry of agreement term and ensure that the Project Facilities may continue to meet such requirements even after the same are handed back to MMC.

(b) Landfill Facility

(i) At least 12 months before the expected expiry of the Landfill Life, the Parties jointly with the Project Engineer shall, discuss and jointly prepare the Post Closure Operating Plan for maintenance of the Landfill Facility, under the provisions of the prevailing statutory regulations ("Post Closure Maintenance Plan").

(ii) The Concessionaire shall after expiry of the Active Operations Period maintain the Landfill Facility in accordance with the Post Closure Maintenance Plan.

(iii) Upon the expiry of the post closure monitoring Period, the Concessionaire shall hand back peaceful possession of the Landfill Facility to MMC free of cost and in reasonable condition.

10.3 MMC's Obligations

MMC shall, subject to MMC's right to encash bank guarantees and there after deduct amounts from the Post Closure Performance Account towards;

(i) carrying out works/jobs listed under **Article 10.2**, which have not been carried out by the Concessionaire,

(ii) any outstanding dues, which may have accrued in respect of the Project during the Concession Period,duly discharge and release to the Concessionaire the amounts in the Post Closure Performance Account in accordance with **Article 7.3**.

ARTICLE 11

DISPUTE RESOLUTION

11.1 Amicable Resolution

(a) Save where expressly stated to the contrary in this Agreement, any dispute, difference or controversy of whatever nature between the Parties, howsoever arising under, out of or in relation to this Agreement (the "Dispute") shall in the first instance be attempted to be resolved amicably in accordance with the procedure set forth in **clause (b)** below.

(b) Either Party may require such Dispute to be referred to the Commissioner, MMC (or the Person holding charge) and the Chief Executive Officer of the Concessionaire for the time being, for amicable settlement. Upon such reference, the two shall meet at the earliest mutual convenience and in any event within 15 days of such reference to discuss and attempt to amicably resolve the Dispute. If the Dispute is not amicably settled within 15 (fifteen) days of such meeting between the two, either Party may refer the Dispute to arbitration in accordance with the provisions of **Article 11.2** below.

11.2 Arbitration

(a) Procedure

Subject to the provisions of **Article 11.1**, any Dispute which is not resolved amicably shall be finally settled by binding arbitration under the Arbitration and Conciliation Act, 1996. The arbitration shall be by a panel of three arbitrators, one to be appointed by each Party and the third to be appointed by the two arbitrators appointed by the Parties. The Party requiring arbitration shall appoint an arbitrator in writing, inform the other Party about such appointment and call upon the other Party to appoint its arbitrator. If within 30 days of receipt of such intimation, the other Party fails to appoint its arbitrator, the Party seeking appointment of arbitrator may take further steps in accordance with Arbitration Act.

(b) Place of Arbitration

The place of arbitration shall ordinarily be Madurai but by agreement of the Parties, the arbitration hearings, if required, may be held elsewhere.

(c) Language

The request for arbitration, the answer to the request, the terms of reference, any written submissions, any orders and awards shall be in English and, if oral hearings take place, English shall be the language to be used in the hearings. Any party using Tamil as language shall supply the other party a authorized transcript of true translation of its submissions into English at its costs and expenses. Both parties however may agree upon use of Tamil as the sole language.

(d) Enforcement of Award

The Parties agree that the decision or award resulting from arbitration shall be final and binding upon the Parties and shall be enforceable in accordance with the provisions of the Arbitration Act subject to the rights of the aggrieved parties to secure relief from any higher forum.

11.3 Performance during Dispute

Pending the submission of and/or decision on a Dispute and until the arbitral award is published, the Parties shall continue to perform their respective obligations under this Agreement without prejudice to a final adjustment in accordance with such award.

ARTICLE 12

REPRESENTATIONS AND WARRANTIES

12.1 Representations and Warranties of the Concessionaire

The Concessionaire represents and warrants to MMC that:

(a) it is duly organised, validly existing and in good standing under the laws of India;

(b) it has full power and authority to execute, deliver and perform its obligations under this Agreement and to carry out the transactions contemplated hereby;

(c) it has taken all necessary corporate and other action under Applicable Laws and its constitutional documents to authorise the execution, delivery and performance of this Agreement;

(d) it has the financial standing and capacity to undertake the Project;

(e) this Agreement constitutes its legal, valid and binding obligation enforceable against it in accordance with the terms hereof;

(f) the execution, delivery and performance of this Agreement will not conflict with, result in the breach of, constitute a default under or accelerate performance required by any of the terms of the Concessionaire's Memorandum and Articles of Association or any Applicable Laws or any covenant, agreement, understanding, decree or order to which it is a party or by which it or any of its properties or assets are bound or affected;

(g) there are no actions, suits, proceedings or investigations pending or to the Concessionaire's knowledge threatened against it at law or in equity before any court or before any other judicial, quasi judicial or other authority, the outcome of which may constitute Concessionaire Event of Default or which individually or in the aggregate may result in Material Adverse Effect;

(h) it has no knowledge of any violation or default with respect to any order, writ, injunction or any decree of any court or any legally binding order of any Government Agency which may result in Material Adverse Effect;

(i) it has complied with all Applicable Laws and has not been subject to any fines, penalties, injunctive relief or any other civil or criminal liabilities which in the aggregate have or may have Material Adverse Effect;

(j) Without prejudice to any express provision contained in this Agreement, the Concessionaire acknowledges that prior to the execution of this Agreement, the Concessionaire has after a complete and careful examination made an independent evaluation of the Project Facilities, and the information provided by MMC, and has determined to its satisfaction the nature and extent of risks and hazards as are likely to arise or may be faced by the Concessionaire in the course of performance of its obligations hereunder.

(k) The Concessionaire also acknowledges and hereby accepts the risk of inadequacy, mistake or error in or relating to any of the matters set forth above and hereby confirms that MMC shall not be liable for the same in any manner whatsoever to the Concessionaire.

12.2 Representations and Warranties of MMC

MMC represents and warrants to the Concessionaire that:

(a) That it is duly incorporated under the laws of India and has the power to conduct its business as presently conducted and to enter into this Agreement;

(b) That it has full power, capacity and authority to execute, deliver and perform this Agreement and has taken all necessary sanctions and approvals and followed all the procedure required to authorise the execution, delivery and performance of this Agreement

(c) Nothing in this Agreement conflicts with its constitutional authority, mandate, or any law or any other agreement, understanding or arrangement or any judgment, decree or order or any statute, rule or regulation applicable to it

(e) All approvals and permissions as are necessary for the execution of this Agreement have been obtained and all the required procedure for the due execution of this Agreement have been adhered to and further that this Agreement will be valid, legal and binding against it under the Indian Law;

12.3 Obligation to Notify Change

In the event that any of the representations or warranties made/given by a Party ceases to be true or stands changed, the Party who had made such representation or given such warranty shall promptly notify the other of the same.

ARTICLE 13

MISCELLANEOUS

13.1 Assignment and Charges

(a) The Concessionaire shall not assign in favour of any person this Agreement or the rights, benefits and obligations hereunder save and except with prior consent of both MMC & Lenders.

(b) The Concessionaire shall not create nor permit to subsist any Encumbrance over the Project Facilities except with prior consent in writing of MMC & Lenders

(c) Restraint set forth in clauses (a) and (b) above shall not apply to:

(i) liens/encumbrances arising by operation of law (or by an agreement evidencing the same) in the ordinary course of business of the Concessionaire:

(ii) Pledges/hypothecation of goods/stocks/moveable assets, revenue and receivables as security for indebtedness, in favour of the Lenders and working capital providers for the Project;

(iii) assignment of Concessionaire's rights and benefits under this Agreement to or in favour of the Lenders as security for financial assistance provided by them.

13.2 Interest and Right of Set Off

Any sum which becomes payable under any of the provisions of this Agreement by one Party to the other Party shall, if the same be not paid within the time allowed for payment thereof, shall be deemed to be a debt owed by the Party responsible for payment thereof to the Party entitled to receive the same. Such sum shall until payment thereof carry interest at prevailing prime lending rate of State Bank of India per annum from the due date for payment thereof until the same is paid to or otherwise realised by the Party entitled to the same. Without prejudice to any other right or remedy that may be available under this Agreement or otherwise under law, the Party entitled to receive such amount shall also have the right of set off.

Provided the stipulation regarding interest for delayed payments contained in this Article 13.2 shall neither be deemed or construed to authorise any delay in payment of any amount due by a Party nor be deemed or construed to be a waiver of the underlying breach of payment obligations.

13.3 Governing Law and Jurisdiction

This Agreement shall be governed by the laws of India. The Courts at Madurai shall have jurisdiction over all matters arising out of or relating to this Agreement.

13.4 Waiver

(a) Waiver by either Party of any default by the other Party in the observance and performance of any provision of or obligations under this Agreement:

(i) shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions or obligations under this Agreement;

(ii) shall not be effective unless it is in writing and executed by a duly authorised representative of such Party; and

(iii) shall not affect the validity or enforceability of this Agreement in any manner.

(b) Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation hereunder nor time or other indulgence granted by a Party to the other Party shall be treated or deemed as waiver/breach of any terms, conditions or provisions of this Agreement.

13.5 Survival

Termination of this Agreement

(a) shall not relieve the Concessionaire or MMC of any obligations already incurred hereunder which expressly or by implication survives Termination hereof, and

(b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, shall not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of or caused by acts or omissions of such Party prior to the effectiveness of such Termination or arising out of such Termination.

13.6 Amendments

This Agreement and the Schedules together constitute a complete and exclusive understanding of the terms of the Agreement between the Parties on the subject hereof and no amendment or modification hereto shall be valid and effective unless agreed to by all the Parties hereto and evidenced in writing.

13.7 Notices

Unless otherwise stated, notices to be given under this Agreement including but not limited to a notice of waiver of any term, breach of any term of this Agreement and termination of this Agreement, shall be in writing and shall be given by hand delivery, recognised international courier, mail, telex or facsimile transmission and delivered or transmitted to the Parties at their respective addresses set forth below:

If to MMC :

Madurai Municipal Corporation (MMC)
Aringnar Anna Maaligai, Thallakulam
Madurai 625 002, TN, India
Telephone: 0452 –2530521-26
Facsimile: 0452 -2530965

If to the Concessionaire:
The Managing Director,
----------,
----------,

Ph No :----------
Fax No. ----------

Or such address, telex number, or facsimile number as may be duly notified by the respective Parties from time to time, and shall be deemed to have been made or delivered

(i) in the case of any communication made by letter, when delivered by hand, by recognised international courier or by mail (registered, return receipt requested) at that address, and

(ii) in the case of any communication made by telex or facsimile, whentransmitted properly addressed to such telex number or facsimile number.

13.8 Severability

If for any reason whatsoever any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties shall negotiate in good faith with a view to agreeing upon one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable. Provided failure to agree upon any such provisions shall not be subject to dispute resolution under this Agreement or otherwise.

13.9 `No Partnership

Nothing contained in this Agreement shall be construed or interpreted as constituting a partnership between the Parties. Neither Party shall have any authority to bind the other in any manner whatsoever.

13.10 Language

All notices required to be given under this Agreement and all communications, documentation and proceedings which are in any way relevant to this Agreement shall be in writing and in English language and true translation into English language if Tamil is used at user's costs and expenses.

13.11 Exclusion of Implied Warranties etc.

This Agreement expressly excludes any warranty, condition or other undertaking implied at law or by custom or otherwise arising out of any other agreement between the Parties and any representation by any Party not contained in a binding legal agreement executed by the Parties.

13.12 Counterparts

This Agreement may be executed in two counterparts, each of which when executed and delivered shall constitute an original of this Agreement but shall together constitute one and only the Agreement.

IN WITNESS WHEREOF THE, PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

SIGNED SEALED AND DELIVERED

For and on behalf of MMC by:	**For and on behalf of CONCESSIONAIRE by:**
(Signature)	(Signature)
(Name) (Name)	
(Designation)	(Designation)
In the presence of :	
1)	2)

Schedule – 1

Details of Project Site

[Map indicating Transfer stations, processing site and disposal site]

Schedule–2

OPERATIONS AND MAINTENANCE REQUIREMENTS OF WASTE PROCESSING & DISPOSAL FACILITY

PART – A - OPERATIONS AND MAINTENANCE REQUIREMENTS OF WASTE

PROCESSING FACILITY

1. General

(a) The Concessionaire shall comply with the O&M Requirements set out in this Schedule. In doing so, the Concessionaire shall ensure that the Waste Processing Facilities are maintained to the standards and specifications as set out in the Construction Requirements and also meet the other requirements, if any, set out in the Agreement.

(b) In the design, planning and implementation of all works and functions associated with the operation and maintenance of the Waste Processing Facilities, the Concessionaire shall take all such actions and do all such things (including without limitation, organising itself, adopting measures and standards, executing procedures including inspection procedures, and engaging contractors, if any, agents and employees) in such manner, as will :

(i) ensure the safety of personnel deployed on and users of the Waste Processing Facilities or part thereof;

(ii) permit unimpaired performance of statutory duties and functions of any party in relation to the Project;

(c) During the Active Operations Period and till the date of handover of the Waste Processing Facilities, the Concessionaire shall, in respect of the Waste Processing Facilities, ensure that :

(i) applicable and adequate safety measures are taken;

(ii) adverse effects on the environment and to the owners and occupiers of property and/or land in the vicinity of the Waste Processing Facilities, due to any of its actions, is minimized;

(iii) any situation which has arisen or likely to arise on account of any accident or other emergency is responded to as quickly as possible and its adverse effects controlled/minimized;

(iv) disturbance or damage or destruction to property of third party by operations of the Waste Processing Facilities is controlled/minimized;

(v) data relating to the operation and maintenance of the Waste Processing Facilities is collected, recorded and available for inspection by respective agencies.

(vi) all materials used in the maintenance, repair and replacement of any of the Waste Processing Facilities shall meet the Construction Requirements;

(vii) the personnel assigned by the Concessionaire have the requisite qualifications and experience and are given the training necessary to enable the Concessionaire meet the O&M Requirements.

2 Operations and Maintenance Manual and O&M Plans

(a) Prior to making application for the Readiness Certificate for the Project the Concessionaire shall finalise in consultation with the Project Engineer:
   (i) the O&M Manual (including the formats for the reports to be submitted during the Active Operations Period and the Post Closure Period)
   (ii) the O&M Plan for the first year of operations.

(b) The concessionaire shall submit to the Project Engineer and MMC an annual O&M Plan for the next year of operations or may inform only the changes made in the existing O&M Plan, if any, in the month of November of every year after COD.

3 Weighment, Acceptance and Rejection of Municipal Solid Waste

3.1 Weighment of Municipal Solid Waste

3.1.1 The Concessionaire shall provide for a weigh-bridge in accordance with the Construction Requirements for Weighment of the Municipal Solid Waste supplied by MMC.

3.1.2 The Concessionaire shall record at least the following data:
(a) Date of operation
(b) Registration number of the truck supplying Municipal Solid Waste/ Lorry number
(c) Total weight of the truck
(d) Time of entry of the truck
(e) Zone/ circle/ ward from which Municipal Solid Waste has been collected
(f) Empty weight of the truck
(g) Net weight of Municipal Solid Waste
(h) Time of exit of the truck

3.1.3 The format for recording shall be finalised in consultation with the Project Engineer, and the same shall be documented as part of the O&M Manual. A sample format is enclosed below for reference at annexure 2.1.

3.1.4 In the event that the weigh-bridge provided in accordance with **sub-clause 3.1.1** above is not in operation, the concessionaire has to make alternative arrangements for weighing of trucks at his own cost and expense and in a manner acceptable to the Project Engineer and MMC. Under unavoidable circumstances, with the written consent of the Project Engineer, the concessionaire may use the following to estimate quantity delivered.

$W = W_{AVG} * N$

Where,

W, is the weight of Municipal Solid Waste supplied during the period for which the weigh-bridge was inoperable

W_{AVG}, is the average weight of Municipal Solid Waste carried per truck based on the data available for the six Months prior to the Month in which the weigh-bridge was operable

N, is the number of truck-loads of Municipal Solid Waste accepted by the Concessionaire during the period for which the weigh-bridge was inoperable.

3.2 Acceptance of Municipal Solid Waste

3.2.1 MMC shall supply Municipal Solid Waste to the facility as per the agreed delivery schedule as per clause 5.7.1.c.

3.2.2 The Concessionaire shall not accept Municipal Solid Waste which is not supplied by MMC or any other Person appointed by it.

3.2.3 Apart from visual inspection procedure, the procedure to be adopted for sampling and testing of non Municipal Solid Waste supplied by MMC to ascertain whether it contains Hazardous and/or Bio-medical Waste shall be finalised by the Parties and the procedure documented as part of the O&M Manual.

3.2.4 The concessionaire shall establish requisite laboratory and testing facility required for testing waste quality, leachate and other environmental monitoring required as the prevailing regulations/ guidelines including MSW Rules, 2000 and Manual on MSW Management, published by MoUD.

4 Production of Compost

4.1 The Concessionaire may adopt any such process and/or methods as it considers necessary for the Processing of Municipal Solid Waste in order to ensure that the compost produced after such product is certified for its conformity to compost quality specified under MSW Rules, 2000.

4.2 The Concessionaire shall inspect the sieving equipment once every three months and carry out any maintenance necessary to minimise wear and tear and ensure that the mesh size is in accordance with the specifications laid down in the Agreement.

5 Production of RDF

The Concessionaire may adopt any such process and/or methods as it considers necessary for the conversion of Municipal Solid Waste into RDF in order to ensure that the RDF produced after such conversion being fit for use as fuel. The concessionaire may eveolve suitable quality parameters for the product and document the same in the O & M Manual to be prepared by him.

5.2 The RDF so produced may be either sold as such or shall be used as fuel for steam generation along with supporting fuel in compliance with applicable guidelines of MNES, GOI for generation of renewable energy with out use of fossil fuel of any kind.

6 Mandatory Facilities

6.1 During the Active Operations Period and until the handover of the Waste Processing Facilities, the Concessionaire shall, unless suitably modify with consent of MMC or the Project Engineer and duly document the O&M Plan and/or O&M Manual, operate and maintain the Waste Processing Facilities as detailed in the manual. The Manual shall cover the various operational aspects which could be exhaustive but including the following:

- Green Belt
- Fencing
- Quality Control Laboratory
- Internal Roads
- Lighting and other electrical works
- Weigh Bridge
- Waste Receipt
- Waste Inspection
- Waste Weighing
- Waste Acceptance Criteria
- Waste Unloading
- MSW Processing Machinery (for Compost plant /RDF plant and or power plant)
- Windrow Platform

- Storm Water Drainage System
- Leachate Collection
- Water Supply System

7 Routine Maintenance Standards

7.1 In order to ensure smooth and uninterrupted operations, routine maintenance of the Project Facilities shall include but not be limited to:

(a) prompt repairs of the weigh-bridge, windrow platforms, leachate collection drainage and treatment system, electrical items, drains, internal roads, seiving machinery, lighting and fencing;

(b) replacement of equipment/consumables, horticultural maintenance and repairs to equipment, structures and other civil works which are part of the Project Facilities;

(c) maintaining the shape, scope, full cross-section of the stormwater drainage system and leachate collection and drainage system;

(d) keeping the Project Facilities in a clean, tidy and orderly condition and taking all practical measures to prevent damage to the Project Facilities or any other property on or near the Site;

(e) undertaking maintenance works in accordance with the O&M Plan and O&M Manual;

(f) preventing, with the assistance of law enforcement agencies, where necessary, any unauthorised entry to and exit from and any encroachments including any encroachments on the Site;

(g) taking all reasonable measures for the safety of all the workmen, material, supplies and equipment brought to the Site. Explosives, if any, shall be stored, transported and disposed of by the Concessionaire in accordance with Applicable Laws/Applicable Permits.

7.2 The following standards in order of preference shall be adopted in consultation with the Project Engineer, unless otherwise specified:

(a) MSW Rules

(b) Manual on Municipal Solid Waste Management published by CPHEEO

(c) Any other standards specified by statute and Applicable Laws

(d) Bureau of Indian Standards (BIS)

(e) Any other standard acceptable international / national guidelines, procedures etc.

7.3 The Concessionaire, for the purpose of routine maintenance shall, in consultation with the Project Engineer, set forth such criteria as to conform to good international standards and Good Industry Practice for sound maintenance of the Project Facilities.

The Concessionaire shall regularly carry out the necessary preventive maintenance activities for the Project Facilities to ensure adherence to the Construction Requirements/ specifications.

8 Emergency Maintenance

8.1 The Emergency Response Protocol ("ERP") shall be developed by the Concessionaire in line with Factories Act. This shall be a part of the O&M Manual developed by the Concessionaire.

8.2 The ERP shall set out steps to be taken and measures to be adopted by the Concessionaire in responding to dealing with Emergency including those situations related to vehicle accidents involving personal injuries or fatalities, property damage and force majeure as follows:

(a) In the event of an Emergency, the Concessionaire shall immediately carry out an inspection of the area affected by the Emergency. Where Emergency has necessitated closure of the Project Facilities or part thereof, the Concessionaire shall promptly carry out any repair works necessary to restore the Project Facilities to safe condition and in any event shall carry out such works before the affected area of the Project Facilities is re-opened to for normal operations.

(b) The Concessionaire shall ensure that sufficient staff, plant, equipment and materials, including without limitation medical assistance are available to respond to Emergency within reasonable period at all times during the Active Operations Period.

8.3 In case of Emergency, the Concessionaire shall

(a) carry out such emergency maintenance and repairs as may be required to repair the damages and where required under the supervision of the police in order to ensure that the Project Facilities are returned to normal operating standards as quickly as possible

(b) take all necessary measures to minimise pollution in accordance with the procedure specified in the O&M Plan/ Environmental Management Plan.

(e) Submit a report to Project engineer /MMC from time to time.

9 Reporting

(a) The Concessionaire shall ensure that MMC and Project Engineer is provided with adequate information and forewarned of any event or any other matter affecting the Project Facilities to enable them to control/minimise any adverse consequences.

(b) The frequency and formats for the reports with respect to waste supplied, processed, rejects generated and disposed to land fill , compost produced / sold and energy generated / sold and any other relevant data like usage of supporting fuels if any , to be submitted and form part of the O&M Plan and O&M Manual.

(c) The following data should form part of the reports submitted by the Concessionaire:

(i) Circle wise quantity of Municipal Solid Waste received

(ii) Municipal Solid Waste characterisation

(iii) Leachate generation

(d) The Concessionaire shall furnish to MMC three copies of “as-built” Drawings of any construction undertaken after COD.

ANNEXURE 2.1

SAMPLE FORMAT OF LOGBOOK AT RECIPT POINT OF SANITARY LANDFILL SITE

Date: ----------							**Shift : ------**			
Time Hrs	**Vehicle number**	**Driver name**	**Area from where wastes is lifted**	**Initial Wt (T) (with waste-vehicle in):**	**Final Wt (T) (without waste – vehicle out)**	**Weight of waste Received (T):--**	**Waste disposal location:**	**Presence of hazardous / bio-medical waste:**	**If yes, specify waste unloading place:**	**Waste Acceptance**
							(specify cell no, location, tem-porary marking etc)	Yes /No	(earmark a specific place for unloading contaminated wastes – for segregating hazardous / biomedical wastes)	Acceptable /Not Acceptable (Use rubber stamp)

Signature of Shift In-charge

SCHEDULE 2

PART – B - OPERATIONS AND MAINTENANCE REQUIREMENTS OF DISPOSAL FACILITY - SANITARY LANDFILL FACILITY

1 General

(a) The Concessionaire shall comply with the O&M Requirements for landfill facility as set out in this Schedule. In doing so, the Concessionaire shall ensure that the Landfill Facilities are operated and maintained to the applicable regulations, standards and specifications and also meet the other requirements, if any, set out in the Agreement.

(b) In the design, planning and implementation of all works and functions associated with the operation and maintenance of the Landfill Facility, the Concessionaire shall take all such actions and do all such things (including without limitation, organising itself, adopting measures and standards, executing procedures including inspection procedures, and engaging contractors, if any, agents and employees) in such manner, as will :

(i) Ensure to accommodate mixed waste from the existing disposal site

(ii) ensure the safety of personnel deployed on and users of the Landfill Facility or part thereof;

(iii) keep the equipment and machinery employed at the Landfill Facility from undue deterioration and wear;

(iv) permit unimpaired performance of statutory duties and functions of any party in relation to the Project;

(c) During the Concession Period, the Concessionaire shall, in respect of the Landfill Facility, ensure that:

(i) applicable and adequate safety measures are taken;

(ii) adverse effects on the environment and to the owners and occupiers of property and/or land in the vicinity of the Landfill Facility, due to any of its actions, is minimised;

(iii) any situation which has arisen or likely to arise on account of any accident or other emergency is responded to as quickly as possible and its adverse effects controlled/minimised;

(iv) disturbance or damage or destruction to property of third party by operations of the Landfill Facility is controlled/minimised;

(v) data relating to the operation and maintenance of the Landfill Facility is collected, recorded and available for inspection by the Project Engineer/MMC/other regulatory agencies.

(vi) all materials used in the operation, maintenance of any of the Landfill Facility shall meet the Construction Requirements;

(vii) the personnel assigned by the Concessionaire have the requisite qualifications and experience and are given the training necessary to enable the Concessionaire meet the O&M Requirements.

2 Operations and Maintenance Manual and O&M Plans

The Concessionaire shall finalise the O&M Plan and the O&M Manual for the Landfill Facility in consultation with the Project Engineer / MMC.

3 Sampling and Testing

3.1 Unless modified with mutual consent by the Parties, the Residual Inert Matter shall be sampled and tested in the manner as set out below:

3.2 The Residual Inert Matter proposed to be taken to the Landfill Facility shall be placed in heaps of almost uniform size of sizeable quantity. The chemist shall take ten random samples from each of these heaps. These random samples shall then be thoroughly mixed and a single random sample taken and tested as per the procedure set out in Appendix 1 of this Schedule in the presence of the Project engineer or his authorized representative. In case the composition of this single random sample satisfies the criteria set out in **Article 11** of this Schedule, it shall be deemed as being "Fit for Landfilling".

3.3 The Concessionaire shall be solely responsible for the composition of the material disposed in the Landfill Facility.

4 Weighment

4.1 The Concessionaire shall provide for a weighbridge for weighing waste before disposal into SLF.

4.2 The Concessionaire shall not take any Residual Inert Matter into the Landfill Facility without having obtained the "Fit for Landfilling" certificate from the Project Engineer or his authorized representative. The Concessionaire shall plan his operations in a manner such that the Landfill Waste is taken into the Landfill Facility only in the daytime during normal operations or as mutually agreed upon between MMC and the Concessionaire.

4.3 The Concessionaire shall record the following minimum data with regard to the Landfill Waste:

(a) Date of operation
(b) Total weight of the truck + landfill-able waste
(c) Time of entry of the truck
(d) Empty weight of the truck
(e) Time of exit of the truck

4.4 In the event that the weigh-bridge provided in accordance with **sub-clause 4.1** hereinabove is not in operation, the Concessionaire shall make alternate arrangement for weighing of waste prior to disposal in SLF at his own cost and expense. Such Weighment and transport of the Residual Inert Matter shall be done only under the direct supervision of the Project Engineer or his authorized supervisor..

4.5 The procedure for Weighment of the Landfill Waste and certification by the Project Engineer or his authorized representative shall be as set out in the O&M Plan and the O&M Manual.

5. Landfill Operation

5.1 Monsoon cover liner

(a) The Concessionaire shall provide a intermediate liner or the monsoon cover liner, as per MSW Rules, 2000, to take care of the monsoon season before the onset of monsoon leaving only a temporary shed for operations during non-raining period of the day.

5.2 Daily Cell Cover

On each day during the Active Operations Period, the Concessionaire shall compact the Landfill Waste and cover the same ("Daily Cell Cover") in the manner as specified in MSW Rules, 2000.

5.3 Landfill Closure and Final Cover

(a) The Concessionaire shall demonstrate the actual stability by considering the strength parameters of compacted inert material.

(b) The concessionaire shall inform the Project Engineer /MMC atleast one year in advance about the exhaustion of landfill, providing the following details:

  (i) The estimated quantity of Landfill Waste that can be Landfilled in future

  (ii) The probable date till which Municipal Solid Waste can be accepted by the Waste Processing Facility

  (iii) The plan for laying the final cover ("Final Cover") for the Landfill Facility

(c) The Concessionaire shall provide the Final Cover in accordance with MSW Rules, 2000.

5.4 Vegetative cover

(a) The Concessionaire shall, in accordance with MSW Rules ensure the provision of a vegetative cover after laying of the Final Cover.

(b) The selection of the varieties of plants /grass to be planted shall be decided in consultation with the Project Engineer/MMC and shall form part of the Post Closure Maintenance Plan.

5.5 Leachate Collection and Removal System ("LCRS")

(a) The Concessionaire shall ensure that there is no run-on/ run-off to and from the facility.

(b) The Concessionaire shall ensure that all leachate drains are free from clogging and allows unobstructed flow of leachate.

(c) Only treated leachate to be let out from the site, which shall meet the standards prescribed under MSW Rules, 2000.

5.6 Provisions for Landfill Gas Recovery / Venting System

5.6.1 The Concessionaire shall examine the requirement of providing Landfill Gas Recovery / Venting System in consultation with the project engineer and if found necessary make suitable provisions to avoid any potential hazard to the environment. The MSW Rules, 2000 and other applicable guidelines prevailing guidelines prevent the disposal of bio-degradable waste into landfills. However, based on the level of segregation achieved and waste characterises disposed off into landfill, the requirement of gas recovery / venting system may be designed.

5.6.2 The concessionaire may also consider the requirements for getting CDM benefits, while planning for the above.

5.7 Post-Closure Maintenance Plan

5.7.1 The Concessionaire shall maintain the Landfill Facility during the Post Closure Period in accordance with the Post-Closure Maintenance Plan.

5.7.2 At least three months prior to the completion of any Financial Year during the Post Closure Period, the Concessionaire shall prepare and submit for review and approval by the Project Engineer/MMC, the Post Closure Maintenance Plan for the subsequent Financial Year.

5.7.3 Post-closure maintenance shall be in accordance with Applicable Laws and shall involve periodical inspections, of at least once every three months, of the Landfill Facility to monitor

land surface care, leachate collection, and methane control by way of flaring and to maintain flaring equipment.

5.7.4 Post-closure maintenance shall also involve investigations for detection of adverse environmental impacts, if any, and implementation of measures for mitigation of the same.

6 Environment Monitoring System

6.1.1 The Environmental Monitoring shall be carried out as stipulated in the MSW Rules, 2000, Manual on MSW Management, prepared by MoUD and other application regulations. The monitoring schedule, parameters and locations are to be detailed in the O&M manual to be prepared by the concessionaire.

6.1.2 The Concessionaire shall provide the instruments/equipment required for carrying out the environmental monitoring tests as per the above requirements.

7. Mandatory Facilities

The Concessionaire shall, unless suitably modified in the O&M Plan and/or the O&M Manual, operate and maintain the mandatory facilities in accordance with acceptable standards. The Manual shall cover the various operational aspects which could be exhaustive but including the following:

- Quality Control Laboratory
- Internal Roads
- Lighting and other electrical works
- Weigh Bridge
- Waste Receipt
- Waste Inspection
- Waste Weighing
- Waste Acceptance
- Waste Unloading
- Waste Placement and Compaction
- Landfill Machinery and their use, O&M issues etc
- Storm Water Drainage System
- Leachate Collection and Drainage System
- Leachate Treatment Plant
- Water Supply System

Emergency Maintenance

The terms and conditions shall be as set out under **Clause 8** of **Schedule 2**.

8. Reporting

(a) The Concessionaire shall ensure that MMC and Project Engineer is provided with adequate information and forewarned of any event or any other matter affecting the Project Facilities to enable them to control/minimise any adverse consequences.

(b) The frequency and formats for the reports to be submitted shall be finalised in consultation with the Project Engineer and form part of the O&M Plan and O&M Manual.

(c) The following data should form part of the reports submitted by the Concessionaire:
   (i) Residual Inert Matter quality test reports
   (ii) Leachate generation
   (iii) Emission of greenhouse gases
   (iv) Ground Water quality (both within and outside the Site)

(v) Waste processed per month
(vi) Breakdowns and repairs
(vii)Waste converted to compost or combusted for energy recovery

(d) The Concessionaire shall also maintain a system for tracking the location of Landfilling operations within the Engineered Sanitary Landfill on a daily basis.

(e)The Concessionaire shall furnish to MMC three copies of "as-built" Drawings of any construction undertaken after COD.

9. Tests for Inerts & Compost

The Concessionaire shall include relevant testing procedures for inert and compost in the O&M manual.

APPENDIX –1

TEST PROCEDURE FOR ORGANIC CONTENT IN WASTE

Following testes needs to be carried out to prove that Residual Inert Matter meets the desired norms:

Reagents & Chemicals	1. 35% Perchloric Acid (v/v) 2. 2% Iodine Solution 3. Dissolve 4 gms of Iodine (AR Grade) and 8 gms of Potassium Iodide in 500 ml distilled water
Method	1. Weigh 1 gm of Air-dried sample in a 100 ml beaker. Keep the mixture to react for 20 mintues. 2. Filter the slurry through Whattman No. 542 Filter paper in a 250 ml conical flask 3. Add 2 ml of Iodine solution to the filtrate and observe the colour change
Results	
Golden Yellow Colour	Indicates total Inerts – Acceptable at landfill site
Reddish Brown Colour	Indicates some biodegradables – Sample needs to be physically examined before acceptance
Greenish Blue to blue Colour	Not acceptable at landfill site

The test as above is an indicative test and any other equivalent test mutually agreed between MMC and the concessionaire may be sued to determine the percentage of biodegradable matter in Residual Inert Matter.

SCHEDULE – 3

CALCULATION OF MONTHLY FEES

1. Daily waste quantity
   a. 350 TPD starting from COD and immediate next year.
   b. For subsequent years, MMC shall indicate to the Concessionaire, by end of 11th month (November, 200X) of every year during the Term, the Waste Quantity that MMC shall be supplying daily at the Receipt Point(s) during the next year (January through December of 200X + 1). However, such quantity can not be less than the quantity indicated by MMC for the current year.

1. Minimum Daily waste quantity is 10% less than the daily waste quantity indicated by MMC. (During the first year of COD, it would be 315 TPD)

2. Actual Daily Waste Quantity is the quantity of waste actually supplied by MMC at the receipt point at any particular day.

3. Minimum Aggregate Waste Quantity (Assured waste Quantity)

   Wm = Minimum Daily Waste quantity *D tonnes

   Where,

   Wm is the aggregate quantity of Municipal Solid Waste agreed to be supplied by MMC to the Receipt points during any given Month ("Assured Waste Quantity").

   D is the number of days in a particular Month,

   As an example, for the month of April in first year after COD,

   Wm = 315 TPD x 30 days - = 9450TPD

4. Fees

Refers to the rate per tonne of MSW quoted by the Concessionaire as a part of its financial bid. The applicable fees for each year is enclosed at Annexure ____. It may be noted that if the transportation facility is made operational before processing & disposal facilities are developed, the applicable fees shall refer to the amount quoted under transportation head in the financial proposal.

5. Preparation of monthly fee statement
   a. Minimum monthly fees is the amount arrived by multiplying the applicable fees with the assured waste quantity (Minimum aggregate waste quantity). It may be specifically noted that even if the actual waste supplied by MMC is less than Assured Waste Quantity for any particular month, the Concessionaire shall still be entitled to receive payments equivalent to Minimum monthly fees.
   b. Monthly fees is the amount arrived by multiplying the applicable fees with the actual total waste quantity supplied by MMC in any given month.
   c. Additional monthly fees:
      i. If on any particular day, the actual daily waste quantity is more than 125% of the Daily Waste quantity (for eg. 350 TPD during first year after COD), then MMC shall pay, for such excess quantity of waste, an additional amount that shall be calculated as below:

         Additional fees for a particular day

         = (Actual waste quantity - 125% of daily waste quantity) * 25% of the applicable fees

      ii. If on any particular day, the actual daily waste quantity is less than minimum daily waste quantity (90% of the Daily Waste quantity), then MMC shall pay, for such deficient quantity of waste, an additional amount that shall be calculated as below

Additional fees for a particular day = (Minimum daily waste quantity - Actual waste quantity) * 25% of the applicable fees

Additional monthly fees is the sum total of all such additional fees calculated for any particular month.

d Monthly fee statement

Monthly fee statement shall be sum total of the higher of (a) or (b) and (c) and shall be furnished as per the format provided below:

Monthly fee statement for the month of ----------, 20XX

Net Applicable fee for the year 20XX,	100 Rs/T
Daily waste quantity	350 TPD
Minimum Daily waste quantity (90% of daily waste quantity)	315 TPD
Maximum Daily waste qty (125% of Daily waste quantity)	437.7 TPD

S.No.	Date	Actual waste quantity received	Quantity less than Minimum waste qty	Quantity more than Maximum waste qty	Additional fees in Rs	
					Short supply	Excess supply
1	1-Apr-09	330	0	0	0	0
2	2-Apr-09	350	0	0	0	0
3	3-Apr-09	370	0	0	0	0
4	4-Apr-09	310	5	0	625	0
5	5-Apr-09	300	15	0	1875	0
6	6-Apr-09	500	0	62.5	0	1562.5
7	7-Apr-09	370	0	0	0	0
8	8-Apr-09	290	25	0	3125	0
9	9-Apr-09	310	5	0	625	0
10	10-Apr-09	475	0	37.5	0	937.5
11	11-Apr-09	370	0	0	0	0
12	12-Apr-09	300	15	0	1875	0
13	13-Apr-09	310	5	0	625	0
14	14-Apr-09	490	0	52.5	0	1312.5
15	15-Apr-09	370	0	0	0	0
16	16-Apr-09	320	0	0	0	0
17	17-Apr-09	300	15	0	1875	0
18	18-Apr-09	525	0	87.5	0	2187.5
19	19-Apr-09	430	0	0	0	0
20	20-Apr-09	290	25	0	3125	0
21	21-Apr-09	310	5	0	625	0
22	22-Apr-09	475	0	37.5	0	937.5

23	23-Apr-09	370	0	0	0	0
24	24-Apr-09	300	15	0	1875	0
25	25-Apr-09	310	5	0	625	0
26	26-Apr-09	490	0	52.5	0	1312.5
27	27-Apr-09	400	0	0	0	0
28	28-Apr-09	290	25	0	3125	0
29	29-Apr-09	310	5	0	625	0
30	30-Apr-09	475	0	37.5	0	937.5
		11040			20625	9187.5

Minimum monthly waste quantity = 9450 T
Actual monthly waste quantity = 11040 T

Monthly fees = 11,100 * 100 = Rs. 11,04, 000
Additional monthly fees = Rs. 29,813
Total Monthly fees = Rs. 11,33,813/-

Schedule – 4

LAND LEASE AGREEMENT (Model)

This LEASE AGREEMENT made on the _____ day of _____ in the year Two Thousand and Six

BETWEEN

Madurai Municipal Corporation, a municipal body established under the Madurai Municipal Corporation Act 1971 and having its offices at _____, acting through its Commissioner (hereinafter referred to as "**the Lessor**" which expression shall wherein the context or subject to implies include its successors and assigns)

AND

M/s ___, a company incorporated under the Companies Act, 1956 and having its registered office at _____ (hereinafter referred to as "Lessee" which expression shall unless it be repugnant to the subject or context be deemed to include its successors and permitted assigns).

WHEREAS

A. The **Madurai** Municipal Corporation is desirous of improving its municipal solid waste management and disposal capabilities in order to enable the due discharge of its functions under the MSW Rules 2000 and for that purpose has approved the establishment of an integrated municipal solid waste project by the Lessee at **Madurai** ("**Project**") and has entered into a concession agreement dated __ with M/s ___, the Developer ("**Concession Agreement**"), on the same date as this lease Agreement, under which it has authorized the Lessee to implement the Project.

B. The **Madurai** Municipal Corporation in order to enable the due implementation of the Project and to discharge its obligations under the Concession Agreement is hereby providing the Lessee (the Developer under the Concession Agreement), by way of this lease agreement ("**this Agreement**"), the Demised Premises (more particularly delineated in Schedule A hereto and shown in the site map attached thereto) for the purposes of implementing the Project and constructing, operating and maintaining the integrated waste processing plant and disposal facility on the Demised Premises, on the terms and conditions and subject to the covenants and stipulations hereinafter contained.

NOW THIS INDENTURE OF LEASE WITNESSETH AS FOLLOWS:

1. This Agreement shall be co-terminus with the Concession Agreement and is to be read, for any interpretation, together with the provisions of the Concession Agreement.
2. The terms that are used but not defined in this Agreement shall have the same meaning as given to them in the Concession Agreement.
3. In consideration of the Lessee undertaking to implement the Project in accordance with the provisions of the Concession Agreement and undertaking to pay the lease payment stipulated in Clause 4 below; the Lessor hereby demises to the Lessee, all the land (together with any physical structures existing thereon) which is described, delineated and shown in the Schedule A hereto (the"**Demised Premises**"), to hold the said Demised Premises, without interruption or interference together with the full and free right and liberty of way and passage and other rights in relation thereto, for as long as the Concession Agreement does not lapse due to expiry of its term or is not terminated earlier in accordance with the provisions

thereof. The term of this Agreement shall be co-terminus with the Concession Agreement. The Lessor hereby agrees and authorizes the construction, operation and maintenance of the Plant and each of the Project Facilities on the Demised Premises in accordance with the terms of the Concession Agreement.

4. In consideration of the transfer of the Demised Premises under this Agreement, the Lessor shall, effective from COD, receive a rent of Rupee one per square meter per annum payable on or before the 10th day of the first calendar month in each year provided however, the lease payment can be paid in advance for such period of time as the Lessee may deem fit. The Lessor undertakes and assures the Lessee that the lease payment for the Demised Premises shall remain fixed for the entire period that this Agreement remains valid and binding.

5. The Demised Premises are being vested with the Lessee, under this Agreement, free from any Encumbrances (other than the existing physical structures thereon which has been inspected by the Lessee and agreed to be taken over in accordance with the terms of the Concession Agreement), whether legal or physical in nature. At any time during the term of this Agreement if the Lessee discovers any Encumbrances upon or under the Demised Premises which materially adversely affect its rights in relation to the Demised Premises/the Project, it shall notify the Lessor, which shall, within twenty one (21) days from the receipt of the notice, either remove or cause to be removed such encumbrances at its own cost. In the event that the Lessor fails to remove such encumbrances within twenty one (21) days from the notice thereof, the Lessee may remove or cause to be removed such encumbrance and the costs and expenses or consequential liabilities incurred in respect thereof shall be reimbursed to the Lessee by the Lessor.

6. The Demised Premises are being vested with the Lessee, under this Agreement only for the purposes of the Project including for the purposes of developing, establishing, designing, constructing, operating the maintaining the Plant, which the Lessor is desirous of being constructed, operated and maintained on the Demised Premises for the purposes of enabling the processing the Municipal Waste in accordance with the Concession Agreement. The Lessor hereby authorizes and consents to the receipt of consignments of Municipal Waste, the storage and processing of Municipal Waste and Residual Inert Matter as well as to the receipt and storage of any waste (including Excluded Waste and Rejected Waste) that may have been received by the Lessee in any consignment of Municipal Waste.

7. The Lessor hereby authorizes the Lessee, to construct, erect, own, operate and maintain any superstructure, facility or any movable or immovable structures constituting the Plant (including each of the Project Facilities) on the Demised Premises and for that purpose also remove, renovate, use or demolish any structures that may be existing on the Demised Premises as of the date of this Agreement. The Lessor hereby agrees and acknowledges that it shall not own or have any rights to any superstructure, facility or any moveable or immovable structures constituting the Plant that are constructed or erected or placed on the Demised Premises and further that the same shall be owned by the Lessee. The Lessor hereby agrees that the construction, operation and maintenance of the Plant at the Demised Premises and the receipt, storage and processing of Municipal Waste at the Demised Premises is being undertaken pursuant to the Concession Agreement granted by it and for the purposes of enabling the Lessor to discharge its functions of managing, processing and disposing Municipal Waste.

8. The Lessee shall have the right to, without requiring any prior permission of the Lessor, vest with the Lenders the power to take over the control, possession and all rights and interests in relation to the Demised Premises by appointing a person, the substitute entity, to replace the Lessee and undertake the construction, operation and maintenance of the Plant upon

the occurrence of an event of default by the Lessee, as the case may be, under any of the Financing Agreements. The Lessor shall novate this Agreement in favour of the substitute entity, which shall constitute an agreement between the substitute entity and the Lessor on the terms and conditions of this Agreement as existing at the time of such novation.

9. The Lessor hereby authorises the Lessee to create any Encumbrance over the Plant constructed on the Demised Premises (excepting the land) and this Agreement in favor of the Lenders for enabling financing of the construction, operation and maintenance of the Project. The Lessor agrees that it shall enter into such agreement as may be required by the Lenders to enable financing of the Project and creation of the Encumbrance required by the Lenders. Without prejudice to the terms of this Agreement, the Lessor shall be governed by the terms of any agreement that the Lenders may have entered into with the Lessor in respect of the Encumbrance over the Project Facilities (other than the land constituting the Site which shall not be mortgaged), any assets of the Project and this Agreement, created in favour of the Lenders.

The Lessor hereby covenants and assures the Lessee that:

a) all the land comprising the Site is of non-agricultural status and is permitted and duly authorized and earmarked for purposes of establishment, construction, operation and maintenance of the Plant and the Project Facilities, and that it shall obtain any additional Applicable Approvals that may be required for the development, construction, operation and maintenance of the Project Facilities;
b) the Site is free from any encroachment or encumbrances whatsoever and is not subject to any acquisition or other legal proceedings by any authority, body or government nor is any claim of any third party subsisting in respect thereof or relating thereto;
c) Lessor is the owner of the lands constituting the Demised Premises and it shall, in that capacity, defend or satisfy all actions or claims against the use of the Demised Premises for the Project;
d) it shall not demand or in any manner claim or seek to recover the rent prior to the COD or increase the rent due and payable by the Lessee under the provisions of this Agreement;
e) it shall not interfere with or impede in any manner or otherwise limit, restrict or impose any conditions or restrictions on the complete, free and full enjoyment and use of the Demised Premises and all rights in relation thereto, including the creation of security interest in favour of the Lenders in accordance with the provisions of the Concession Agreement;
f) it shall not interfere in or impede in any manner or otherwise limit, restrict or impose conditions in relation: (i) to the construction, operation and maintenance of the processing Plant & disposal facility; (ii) the implementation of the Project by the Lessee and (iii) the possession, control and use, by the Lessee of the Demised Premises and the Plant;
g) It shall enter into appropriate further documentation or additional writings as the Lessee or the Lenders may reasonably require to give effect to the provisions of this Agreement and the Financing Agreements;
h) there are no litigation, claim, demand or any proceedings (whether administrative, legal or quasi judicial) pending before any authority in respect of the Demised Premises or its use for the purposes of managing, processing and disposing MW; and
i) the Lessee shall have complete, lawful and uninterrupted, possession, control and use of the Demised Premises.

10. The Lessee hereby covenants with the Lessor as follows:
   a) That it shall implement the Project in accordance with the Concession Agreement; and
   b) that it shall observe and perform all terms, covenants, conditions and stipulations of this Agreement.

13. Lessor has lawful title, possession and control of all the lands constituting the Site and has the requisite right and authority to lease the same to Lessee for the Term for the purposes of the Project on the terms and conditions of this Agreement and further that Lessee shall have full, free and uninterrupted peaceful Vacant Possession, enjoyment/ occupation and use of the Demised Premises throughout the Term, without any obstruction interference or disturbance or claim whatsoever from the Lessor or from any person claiming through under or in trust for Lessor or from any third person whomsoever. Lessor shall keep Lessee fully indemnified and harmless against any claims or demands from any Person claiming right, title or interest to or in the Demised Premises or any part thereof or challenging the validity of the usage of the Demised Premises for the Project or challenging the validity of this Agreement, as also against any actions, proceedings, damages, losses and expenses caused to Lessee as a result or in consequence of any such claims or demands as aforesaid.

14 (a) Subject to Sub-Clause(b) and(c) below, no assignment of this Agreement or any rights or duties hereunder shall be made in whole or in part by any Party without the written consent of the other Party and in the event of any assignment the assignee shall assume the duties and liabilities of the assignor.

   (b) It is hereby specifically agreed that the Lessee shall, in the event of forming a limited company either as subsidiary company or jointly along with any other company or otherwise, be at liberty to assign and transfer the Plant, the Demised Premises and this Agreement or the rights and benefits hereof or duties hereunder to such newly formed limited company or in favour of such subsidiary company of the Lessee or any of its holding company for the time being. The Lessee, shall, however, in such event obtain formal consent from the Lessor, which consent shall not be withheld by Lessor. Any assignment by the Lessee shall be subject to the condition that the assignee shall assume the duties and liabilities of the Lessee.

   (c) The Lessor hereby agrees that the Lessee shall not require any prior approval of the Lessor for creating any Encumbrance, right, title, or interest over the Demised Premises (excepting land) and the Project Facilities and the other assets of the Project, in favour of the Lenders.

   (d) Lessor confirms that the Financing Documents may include suitable rights in favour of the lenders for taking over the Demised Premises and the Plant for management, in enforcement of their security upon the happening of an event of default thereunder/the Concession Agreement on the part of the Lessee.

15 The Lessor hereby assures and represents to the Lessee that the vesting of the Demised Premises under this Agreement shall be irrevocable for as long as the Concession Agreement remains in force and the Lessor shall not terminate or seek to terminate this Agreement except upon the expiry or early termination of the Concession Agreement. The Parties hereby agree that on the expiry or termination of the Concession Agreement, the Demised Premises shall be handed back to the Lessor in accordance with the provisions of the Concession Agreement and that this Agreement shall terminate only on the handing over of the Plant and the Site to the Lessor in accordance with the terms of the Concession Agreement

16. Any disputes and/or differences arising between the Parties, in relation to or under this Agreement will be resolved through arbitration in accordance with clause 20 of the

Concession Agreement as per provisions of the Arbitration and Conciliation Act, 1996. The governing law of the arbitration shall be Indian law.

17. The Lessor hereby recognizes that this is a commercial act being undertaken by the Lessor and that it hereby unconditionally and irrevocably waives any right of immunity, sovereign or otherwise from legal proceedings that may be initiated to enforce any provisions of this Agreement.

IN WITNESS WHEREOF the Parties have affixed therein and sealed to this Lease Agreement the day and year first hereinabove written:

SIGN SIGNED, SEALED AND DELIVERED IN THE NAME AND ON BEHALF OF THE LESSOR THROUGH:	
SIGNED, SEALED AND DELIVERED BY LESSEE THROUGH ITS AUTHORISED SIGNATORY IN PRESENCE OF:	

SCHEDULE A

DEMISED PREMISES

(With Site Map)

Schedule – 5

APPLICABLE APPROVALS

List of Approvals / Clearances

S. No	Approval / Clearance	Responsibility to obtain clearance
1.	Prior environmental clearance from Ministry of environment & forests	Concessionaire
2.	Renewal of Site Authorisation under MSW Rules, 2000 from Tamilnadu Pollution Control Board (TNPCB) –	Concessionaire
3.	Chimney Height Clearance from Airport Authority of India, if required.	Concessionaire
4.	Consent to Establish under Air and Water Act from TNPCB	Concessionaire
5.	State urban development department / authority	Concessionaire
6.	Clearance from groundwater board	Concessionaire
7.	Obtaining a tariff for power generated by submitting a petition/ request to the Tamilnadu Electricity Regulatory Commission (TNERC), if required	Concessionaire
8.	Principal approval for power evacuation from distribution company, if required	Concessionaire
9.	Signing up of Power Purchase Agreement with power procurers, if required.	Concessionaire
10.	Tie-up for marketing of products produced from the facility, which may be Refuse Derived fuel, compost/manure, etc.	Concessionaire
11.	Consent to Operate under Air and Water Act from TNPCB	Concessionaire

Schedule – 6

SCOPE OF PROJECT ENGINEER

1. Role of the Project Engineer

The Project Engineer ("PE") is expected to play a positive, proactive & unbiased role in discharging its functions, thereby facilitating the smooth implementation and operation of the Project Facilities. Broadly, the role of the Project Engineer or his authorized representative is to:

(a) review, monitor and where required by the Agreement, to supervise & approve activities associated with the Design, Construction, Operation and Maintenance of the Project Facilities to ensure compliance by the Concessionaire with the Construction Requirements and O&M Requirements;

(b) report to MMC on the various physical, technical and financial aspects of the Project based on inspections, site visits and Tests;

(c) assist in arriving at an amicable settlement of disputes, should the need arise at primary level without recourse to the intervention of C.E.O of the concessionaire and Commissioner of MMC

(d) review matters related to safety and environment management measures adopted by the Concessionaire for the Project.

(e) The engineer may take the services of a III party engineer/firm for providing the services as envisaged hereunder and the mechanism therefor, may be mutually agreed upon by Parties.

2. Scope of Services

The services to be provided by the Project Engineer are listed below. In addition, the scope of services would also include such other functions as are required to be undertaken pursuant to specific provisions of the Agreement.

2.1 Implementation Period

(a) Ensure that all implementation work fully complies with all Applicable Laws and, in particular, MSW Rules governing the requirements of Municipal Solid Waste disposal.

(b) Review all the drawings submitted by the Concessionaire and ensure conformity of the same with the Construction Requirements.

(c) Review of the following submitted by the Concessionaire :

(i) Quality Assurance Plan;

(ii) Implementation Plan;

(iii) O&M Plan – Implementation Period.

2.2 Implementation Period - Construction Inspection and General Services

2.2.1 The Project Engineer would monitor, in accordance with Good Industry Practice, the progress in implementation of the Construction of Transfer stations and transportation of waste, Waste Processing Facility and the Landfill Facility and ensure compliance with the Construction Requirements. For this purpose the Project Engineer shall undertake, inter alia, the following activities and where appropriate make suitable suggestions:

(a) Provide administration of the contract in full and in complete accordance with applicable laws;

(b) Act on the MMC's behalf as the MMC's representative regarding all contact with the Concessionaire unless expressly indicated otherwise;

(c) Review and approve test results and materials and/or equipment used in the Construction Works;

(d) Interpret the requirements of the contract and make decisions regarding performance of the Concessionaire. The PE shall inform and advise the MMC, in a timely manner all matters relating to the execution, progress, and completeness of the Construction Works;

(e) Reject work which fails to comply with the specifications and requirements of the Agreement. Whenever considered necessary or advisable to ensure correction of defective work, the PE may require inspection or testing of such work, whether or not such work be then fabricated, installed, or completed;

(f) Review drawings, samples, and other submissions of the Concessionaire to determine compliance and conformance with the requirements of the Agreement;

(g)Provide the services of experts to check the quality of materials and the workmanship during the installation/construction of the Waste Processing Facility, including the following:

(i) weigh bridge at the Project Facility entry gate;
(ii) windrow platforms;
(iii drainage system;
(iv) leachate collection and treatment system;
(v) water supply system;
(vi) seiving mechanism for the Residual Inert Matter;
(vii) quality control laboratory and associated equipments;
(viii)electrical systems.

(h) Provide the services of experts to check the quality of materials and the workmanship during the installation/construction of the Landfill Facility, including the following:

(i) weigh bridge at the Landfill Facility gate;
(ii) drainage system;
(iii) leachate collection system;
(iv) leachate treatment plant
(v) composite liner system of the Engineered Sanitary Landfill;
(vi) Stability of the Engineered Landfill upto Final Cover
(vii) testing laboratory and associated equipments

(i) Address issues relating to specific site conditions, modifications/amendments, or Concessionaire disputes.

2.2.2 The PE or his authorized representative shall attend regular meetings with the MMC to be held at least once fortnightly during the Implementation Period to report on progress and quality of work performed by the Concessionaire and to discuss problems or other pertinent matters relating to the work. The PE shall take notes at the meetings and provide a copy of the minutes to each person who attended the meeting.

2.2.3 The PE or his authorized representative shall prepare and submit to MMC, Fortnightly Progress Reports including the following:

(a) Progress of works;
(b) Slippages, if any, in the construction vis-à-vis planned construction schedule and the reasons thereof;
(c) Construction schedule for the succeeding week;
(i) Report on Tests
(ii) Report on notices issued

(d) Issues, if any, with regard to the works along with the details of the action taken for the resolution of the same;
(e) Photographic record of progress of works over the previous week , if desired

2.2.4 The PE shall provide all other services as normally provided by a Project Coordinator on behalf of MMC.

2.3 Active Operations Period

2.3.1 During this period the Project Engineer would monitor, in accordance with Good Industry Practice, the operations and maintenance activities undertaken by the Concessionaire so as to ensure compliance with the O&M Requirements. The specific activities to be undertaken would include the following:

(a) Provide administration of the contract in full and in complete accordance with applicable laws;
(b) Act on the MMC's behalf as the MMC's representative regarding all contact with the Concessionaire unless expressly indicated otherwise;
(c) Interpret the requirements of the contract and make decisions regarding performance of the Concessionaire. The PE shall inform and advise the MMC, in a timely manner all matters relating to the execution, progress, and completeness of works;
(d) Reject work which fails to comply with the specifications and requirements of the Agreement. Whenever considered necessary or advisable to ensure correction of defective work, the PE may require inspection or testing of such work, whether or not such work be then fabricated, installed, or completed;
(e) Review submissions of the Concessionaire to determine compliance and conformance with the requirements of the Agreement;
(f) Provide the services representative during the period commencing from 7 seven days from the date of nomination of the PE until the expiry of the PE's nomination.
(g) In addition to conduct a general inspection of the Project Facilities at least once a month and as and when exigencies require to ascertain conformity with Construction Requirements and O&M Requirements;
(h) Provide the services of experts to check the quality of materials and the workmanship during the construction of the Landfill Facility, including that of the following:
    (i) leachate collection system;
    (ii) intermediate liner system of the Engineered Sanitary Landfill;
    (iii) daily cell cover;
    (iv) gas venting and flaring system;
    (v) slope stability of the Engineered Sanitary Landfill;
    (vi) final cover system.
(i) Inspect and certify the quality of Municipal Solid Waste supplied by MMC, when required
(j) Inspect and certify composition of the Residual Inert Matter
(k) Address issues relating to specific site conditions, design modifications, or Concessionaire disputes.
(l) Review the O&M Plans submitted by the Concessionaire from time to time and assists the Concessionaire in finalising the same.
(m) Periodically review the O&M Manual for adequacy;
(n) Monitor Operation and Maintenance activities (including maintenance of Project Facilities and equipment, standards of service, safety and environmental issues) and

the overall quality of O&M activities so as to ensure compliance by the Concessionaire with the O&M Requirements, O&M Plan and O&M Manual;

(o) Review and ascertain the cost variation arising as a result of Change in Law and determine the Additional Cost;

(p) Undertake a quarterly review of the various records and registers to be maintained by the Concessionaire and suggest suitable remedial measures/ procedures, where necessary.

2.3.2 The PE shall attend regular meetings ("Project Review Meetings" or "PRMs") with the Concessionaire, to be held at least once in every month during the Active Operations Period to report on progress and quality of work performed by the Concessionaire and to discuss problems or other pertinent matters relating to the work. The PE shall take notes at the meetings and provide a copy of the PRM minutes to each person who attended the meeting.

2.3.3 The PE shall prepare and submit to MMC, Monthly Project Reports including the following:

(a) Report on Tests

(b) Report on notices issued

(c) Issues, if any, with regard to the works along with the details of the action taken for the resolution of the same;

(f) Photographic record of progress of works over the previous week.

2.4 Handover of Waste Processing Facilities to MMC

2.4.1 At the time of handing back the Waste Processing Facilities to MMC at the end of Active Operations Period, the PE shall:

(a) monitor and certify compliance with the Handback Requirements,

(b) issue a Certificate of Compliance with Handback Requirements to the Concessionaire,

(c) assist in preparation of the Post Closure Maintenance Plan

2.5 Post Closure Period

2.5.1 During the Post Closure Period, the PE shall monitor and certify compliance with the Post Closure Maintenance Plan.

2.5.2 Arrange meetings between MMC and the Concessionaire, to be held at intervals as mutually decided upon by the Parties, to discuss problems or other pertinent matters relating to the Project. The PE shall take notes at the meetings and provide a copy of the minutes of such meetings to each person who attended the meeting.

2.6 Meetings, Records and Reporting

2.6.1 The Project Engineer shall, in the ordinary course, maintain record of the activities undertaken by it in discharge of its functions and responsibilities. This would include records in respect of the following:

(a) Manpower deployed and other organisational arrangements of the Project Engineer;

(b) Reviews of documents submitted to it by the Concessionaire to meet Construction Requirements and O&M Requirements, such as manuals, Drawings, As Built drawings, schedules, plans and reports;

(c) Inspections undertaken and notices/ instructions issued to the Concessionaire;

(d) Review of compliance with Construction Requirements and O&M Requirements;

(e) Tests;

(f) Concession Payments / Tipping Fees certified;

(g) Change in Law;

(h) Force Majeure Events;

(i) Breaches and defaults by the Parties; and

(j) Handback Requirements

2.6.2 The Project Engineer would be required to submit the following reports to MMC during the Concession Period:

(a) Implementation Period
  (i) Fortnightly Progress Report (in accordance with Article 2.2.3 above)
  (ii) Readiness Certificate (including Provisional Readiness Certificate)
  (iii) Any supplemental or special report that may be considered necessary by the Project Engineer (including Force Majeure, and breach of obligations).

(b) Active Operations Period
  (i) Monthly Project Report (in accordance with **Article 2.3.3** above)
  (ii) Any supplemental or special report that may be considered necessary by the Project Engineer (including Force Majeure, and breach of obligations)
  (iii) Annual Review of O&M Manual

(c) Report on Handover Requirements.

Any other report as may be reasonably required by MMC or as may be necessary to give effect to the provisions of the Agreement.

Schedule – 7

Format of Performance Bank Guarantee

SAMPLE FORM OF PERFORMANCE BANK GUARANTEE (UNCONDITIONAL)

TO:

The Municipal Commissioner
Madurai Municipal Corporation

WHEREAS_____[name and address of Contractor] (hereinafter called the Contractor) has undertaken in pursuance of Contract No. _____dated _____to execute the work of development, design & engineering, finance, construction and operation & maintenance of a Municipal Solid Waste Processing facility at Madurai (hereinafter called the Contract); AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a nationalized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee; NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Rs. [amount of Guarantee] _____ [in words], such sum being payable in Indian Rupees in which the contract price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument any sum or sums within the limits of _____[amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us form any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

The guarantee shall be valid until 90 days of the contract completion/termination date or specified otherwise in Letter Of Acceptance (LOA).

SIGNATURE AND SEAL OF THE GUARANTOR:_____

NAME OF BANK:_____

ADDRESS_____

DATE:_____

Request for Proposal
For Collection and Transportation of Municipal Solid Waste in Alandur Municipality (Model)

1 Definitions

In this Contract the following words and expressions shall have the meanings ascribed to them below except where the context otherwise requires:

"AM" means the Alandur Municipality, a body established under The Tamil Nadu District Municipalities Act, 1920 and represented by its Commissioner and shall include its assignees and its legal successors in title.

"Bins" means a container where MSW collected from the Designated area is deposited until its transportation to the Disposal Area

"Change in Law" means the enactment or issuance of (i) any new approval required to be obtained by the Company or any new law (including any act, rule, regulation, notification, order or instruction that have the force of law), or (ii) the amendment, alteration, modification or repeal of any existing law or regulation of a Government Agency (including, without limitation, any law or regulation relating to any taxes, levies, duties, customs, deductions, charges, withholdings, cesses, import fees or assessments or any expropriation or compulsory acquisition) or (iii) any authoritative interpretation of any authority contrary to the existing official interpretation thereof, in each of cases (i) through (iii) above coming into effect after the date of execution of this Contract.

"Collection and disposal of MSW" broadly refers to the process of evacuation of MSW from the designated areas in AM to the disposal area. It will depend on the plan of action submitted by the contractor with his bid and as accepted by AM. But it typically include any or a combination of the following activities:

- Street sweeping

  Streets with proper pavement – systematic sweeping with dust collection

  Streets without proper pavement – searching and sweeping focusing on litter and visual aspect
- Deployment of Bins and reception of MSW in the Bins
- In the case of narrow streets transfer of MSW from Bins to small vehicles (such as tricycles or Autos), for transportation to point of exchange to other vehicles or directly to the disposal area as desired by the contractor
- Transfer of MSW from small vehicles to larger vehicles either directly or after unloading, if desired by the contractor (MSW should not be left in the unloaded state for more than 3 to 4 hours)
- Transfer of MSW from bins to vehicles in broader streets/roads
- Transportation and disposal of all MSW collected from the designated area to the nominated disposal area

"Complaint Desk" means an arrangement provided by the Contractor for AM Inspectors and general public to record complaints, the arrangement being in the form of a desk manned by one or more employees of the Contractor and equipped with atleast one telephone connection.

"Contract Period" is the period specified in Clause 5 of the conditions of contract

"**Contract"** is the contract between AM and the contractor to execute the work of collection and disposal of MSW in the designated area

"**Contractor"** is a person or corporate body whose Bid to carry out the Works has been accepted by the AM and includes the Contractor's personnel, representatives, successors and permitted assignees.

"Days" are calendar days; "**months"** are calendar months.

"Designated area" means the area as specified in the plan issued by AM to the Contractor and placed in section 6 of the RFP document and as revised subject to mutual consent of the AM and the Contractor.

"Disposal Area" means the dumping grounds at R.S.No. 23/1A in Pallikaranai village managed by the AM as specified in the RFP documents and as revised subject to mutual consent of the AM and the Contractor.

"GoTN" means Government of Tamil Nadu.

"Government Agency" means Government of India and Government of Tamil Nadu and all organisations in which the government of India or the Government of Tamil Nadu in their respective executive capacity hold a controlling interest

"Handover Period" means the time period during which the Handover takes place

"Handover" means the process of transfer of facilities and operations of collection and disposal of MSW from the AM to the Contractor as described in the Initial Plan of Action submitted by the contractor with his bid .

"Initial Plan of Action" means a concise plan for the collection, transportation and disposal of MSW in the Designated Area submitted by the contractor, as a part of his technical proposal, which will be annexed to the contract at the time of its execution. This will be replaced by the Plan of Action as defined below.

"Lenders" are the persons who, from time to time, make credit facilities such as debt, letter of credit, together, in each case, with their respective successors and assigns.

"Minimum Average Daily Quantity" means an average of **fifteen metric tonnes** per day of MSW calculated over the days in a billing cycle and is the guaranteed quantity of MSW that will be offered by AM in the designated area, to the contractor subject to the provision of clause 13.3.3 of the Conditions of Contract. This can be revised subject to mutual consent of the AM and the Contractor, subject to the provisions of clause 13.3.4 of the Conditions of Contract .

"MSW" means municipal solid waste and includes garbage consisting of waste from households, commercial areas, markets, public places and other localities in the Designated Area, construction and demolition debris, garden and any vegetable waste, and any waste arising from street sweeping. Industrial effluents and contaminated bio-medical waste do not constitute MSW.

"Party" or "Parties" shall mean collectively the AM and the Contractor and individually, either of them.

"Penalties" are as defined in Clause 11.4 of the Conditions of Contract

"Performance Guarantee " means performance guarantee as defined in Clause 4.1 of the Conditions of Contract.

"Plan of Action" means a comprehensive plan for the collection, transportation and disposal of MSW in the Designated area which shall replace the Initial Plan of Action as and when it is submitted by the Contractor to the AM and approved by AM.

"Start Date" means the date as defined in Clause 4.2 Conditions of Contract.

"TNUIFSL" means the Tamil Nadu Urban Infrastructure Financial Services Limited, or its assignees and its legal successors in title.

"Vehicles workshops" means the area to be handed over by AM to the successful contractor. This area is to be used for the purpose of parking / servicing of contractors vehicles and the cost of development, maintenance and operation of this area shall be borne by the successful contractor within his quoted rates.

"Work" means the collection of MSW from the Designated area and disposal of the same at the Disposal Area by the Contractor as contemplated by this Contract.

2 Interpretation

2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings and paragraph numbering have no significance and are for convenience only . Words have their normal meaning under the language of the Contract unless specifically defined. The Commissioner Alandur Municipality will provide instructions clarifying queries about the Conditions of Contract.

2.2 Reference to any legislation or to any provisions of any legislation shall include any statutory modification or re-enactment of, or any legislative provision substituted for and all legislation and statutory instruments issued under such legislation or provisions till date;

2.3 References to Clauses, Annexures are references to Clauses and Annexures of this Contract

2.4 References to Clauses shall be read in the case of sub-clauses, paragraphs and sub-paragraphs as being references to sub-clauses, paragraphs and sub-paragraphs as may be appropriate;

2.5 Reference to any document or contract shall be deemed to include references to such document or contract as amended, novated, supplemented, varied or replaced from time to time;

3. Scope of work

3.1 The actual plan of work of the contractor shall be as per the Initial plan of action duly amended by the Plan of action and shall include the Sweeping / collection of MSW from the entire Designated area, transportation to the Disposal Area and unloading of MSW at the Disposal Area. The scope may be divided into the following:

- Street sweeping
  - Streets with proper pavement – systematic sweeping with dust collection
  - Streets without proper pavement – searching and sweeping focusing on litter and visual aspect
- Deployment of Bins and reception of MSW in the Bins
- In the case of narrow streets transfer of MSW from Bins to small vehicles (such as tricycles or Autos), for transportation to point of exchange to other vehicles or directly to the disposal area as desired by the contractor
- Transfer of MSW from small vehicles to larger vehicles either directly or after unloading, if desired by the contractor (MSW should not be left in the unloaded state for more than 3 to 4 hours)
- Transfer of MSW from bins to vehicles in broader streets/roads
- Transportation and disposal of all MSW collected from the designated area to the nominated disposal area

3.2 For the purpose of clarity the work will be as further described in the Initial Plan of Action submitted by the contractor, which will form an *Annexure* to the contract document.

3.3 The work shall involve collection and disposal of MSW to be conducted during the night and the day; details of the division between night and day collection and transportation will be as described in the Initial Plan of Action.

4. Preliminaries

4.1 Performance Guarantee

4.1.1 The Contractor shall furnish a Performance Guarantee for an amount of 5% of expected **annual reimbursement (365 days)** calculated for the minimum average daily quantity of MSW at the rates quoted by the contractor.

4.1.2 The Performance Guarantee shall be in the form of an acceptable Bank Guarantee of a Nationalised Bank / Scheduled Bank. The format for which is given in section 4 - forms of agreement. This shall be made valid for a period of thirty days beyond the end of the Contract Period.

4.1.3 If the Performance Guarantee is encashed at any point of time by the AM due to reasons mentioned elsewhere in these Conditions, the Contractor shall furnish a fresh Performance Guarantee within 5 (five) working days of the encashment by AM of the earlier Performance Guarantee. Failure to do so on part of the Contractor shall result in an event of default by the Contractor.

4.2 The **Start Date** shall be the date of signing of this Contract

4.3 Conditions precedent

4.3.1 The Contractor shall fulfil the following conditions precedent within 90 (ninety) days from the date of signing this Contract:

4.3.1.1 The Contractor shall prepare and submit to the AM, a detailed Plan of Action for the work. The contents of the Plan of Action shall not deviate from the contents of the Initial plan of action, submitted by the Contractor, except to the extent agreed by AM in writing.

4.3.1.2 The Contractor shall procure all necessary equipment and vehicles and employ the necessary personnel for the work in accordance with the Plan of Action. The number of personnel, equipment and vehicles that are required to be arranged shall be in accordance with the Plan of Action; the Contractor shall have furnished to the AM, proof of procurement of vehicles and equipment and of employment of personnel for the work.

4.3.1.3 The contractor shall receive all requisite permits and clearances with regard to the work from the concerned central / state / local authorities

4.3.1.4 The contractor shall furnish the Performance Guarantee as described in clause 4.1 of the Conditions of Contract.

4.3.2 AM shall, within 90 (ninety) days from the date of signing this Contract:

4.3.2.1 Hand over the area nominated for the Vehicles Workshops located in Balaji Nagar extension, Adambakkam to the Contractor. The area shall be made available on an "as-is-where-is" condition and shall be provided on rent-free basis to the Contractor for use during the Contract Period. Ownership of the Vehicles Workshops area shall remain with AM. The contractor shall not sublet the premises or carry out activities other that which arises from this contract.

4.3.2.2 Submit copies of the *council* resolution authorising AM to execute the Contract

4.3.2.3 Provide an irrevocable standby Letter of Credit as per rules in force and Reserve Bank of India (RBI) guidelines, issued in favour of the Contractor as described in clause 13.6 of the Conditions of Contract.

4.3.3 Costs of satisfying the above condition precedent shall be borne by the respective Parties responsible for satisfaction of the Conditions Precedent

4.3.4 Non-fulfilment of the Conditions Precedent

4.3.4.1 In case of non-fulfilment of Conditions Precedent attributable to reasons beyond the control of the Contractor and the AM the period for satisfaction of Conditions Precedent may be extended by mutual consent of the Contractor or the AM

4.3.4.2 If any of the conditions precedent contemplated at Clause 4.3.1 and 4.3.2 has not been satisfied in full or has not been waived, within the time stipulated or such extended time that the Parties may agree upon, then and in such event either party shall have the right to terminate this Contract by 30 days notice in writing to the other Party, given at any time thereafter, but prior to such conditions precedent being so satisfied or waived, and if the conditions precedent are not satisfied or waived within such notice period, upon expiry of such notice, this Contract shall terminate

4.3.4.3 If the Contract is terminated due to the non-satisfaction of conditions precedent by the contractor, as set forth at Clause 4.3.1 except that set forth in Clause 4.3.1.3 for reasons beyond the contractors control , the Contractor shall not be compensated in any manner whatsoever and the Performance Guarantee shall be forfeited and encashed

4.3.4.4 If the Contract is terminated due to non-satisfaction of conditions precedent, set forth at Clause 4.3.2 or Clause 4.3.1.3 for no fault of the contractor then AM shall release the Performance Guarantee.

4.4 Start of Operations

The Contractor shall commence the operation of collection and disposal of MSW in a material part of the Designated area within 90 (ninety) days after signing the Contract, subject to the satisfaction or waiver of the Conditions Precedent contained in clause 4.3 of this section. The date from which payment is claimed by the Contractor in accordance with the provisions of clause 13 of the Conditions of Contract for MSW collected and disposed from the full or part of the Designated area shall be defined as the **Date of Start of Operations.**

5 Contract Period

The Contract Period shall be a period of **THREE** years from the Start Date or until the termination of this Contract, whichever is earlier.

6 Exclusivity of Contract

During the Contract Period the Contractor shall be the sole and exclusive agency nominated by AM to undertake the collection and disposal of MSW on AM's behalf, within any part of the Designated area, and no contract permitting such activities by any other Party shall be entered into by AM. If quantity of MSW arising in the designated area turns out to be more than the minimum average daily quantity, the contractor shall have to dispose the additional quantity at the same rate already agreed to for the base quantity.

7 Ownership of MSW

The ownership of the MSW collected and disposed by the Contractor shall rest with the AM.

8 End of Contract Period

8.1.1 Unless contrary laws would be applicable in the state of Tamil Nadu at the end of the Contract Period or upon the termination of the Contract, AM shall not be responsible for employment of the personnel employed by the Contractor for the work.

8.1.2 All contracts entered into by the Contractor and then subsisting shall be determined and AM shall not be liable for any costs including but not limited to termination costs arising thereby. AM shall be indemnified and deemed harmless by the Contractor in respect of the same.

9 Extension of Contract Period

The Contract may be renewed or extended for a further period on terms and conditions to be mutually agreed between AM and the Contractor. Negotiations for renewal of the Contract shall commence 1 (one) year before the expiry of the Contract Period.

10 Variations to the Plan of action

10.1 The Contractor shall conduct his activities according to the Initial Plan of Action that will be attached to the Contract and the Handover Process

10.2 In case the Contractor desires to make any deviations to the Initial Plan of Action the same may be permitted, with the written consent of the AM

10.3 Any deviations to the Initial Plan of Action as approved by AM shall not result in any increase in reimbursement agreed between the Contractor and the AM, attached as an annexure to the Contract save in the circumstances enumerated in this section.

10.4 The Contractor shall periodically inform AM in writing the identities of such personnel and registration numbers of such vehicles (including their capacity) which shall be provided access to the Disposal Area

10.5 Inaccessibility to the Disposal Area/designated area

10.5.1 In the event of restriction of access to the Disposal Area for vehicles belonging to the Contractor, he shall be obligated to transfer the MSW collected to an alternative site if provided.

10.5.2 In the event AM fails to provide the Contractor with an alternative site for disposal of MSW, the contractor shall be relieved from his obligations to collect and dispose MSW, for the period of time for which the restriction of access to the disposal area persists or till the time AM fails to provide the Contractor with an alternative site for disposal of the MSW.

10.5.3 The Contractor shall be obligated to inform the AM, in writing, the period and the cause of restriction of access to the Disposal Area.

10.5.4 In the event that the access to the designated area or any part is restricted or changed or is not complete, as it existed during the time of submission of bids, albeit a temporary one, the contractor shall plan an alternate MSW collection method, in consultation with the AM, for evacuating the MSW in the affected area. Such changed plan will have to devised and executed if MSW collection will be affected for a period of more than two days in the concerned area. The contractor shall claim no extra compensation for such revised measures that are likely to continue for a period of upto and including fifteen days. However if such obstructions/change to the access in the designated area are for causes attributable to the contractor there shall

be no limits to the time for which the revised MSW evacuation plan will have to be adopted, without any claim for extra compensation. Such of those changes to the access that are permanent in nature, due to private parties exercising their legitimate property rights, there shall be no cure for the contractor and he shall continue to employ the revised evacuation plan at no extra cost till the end of contract.

10.5.5 AM shall provide accessibility to the Disposal Area for personnel and vehicles belonging to the Contractor

10.5.6 AM shall inform the Contractor at least 24 hours in advance in case of any restriction/obstruction to the access to or from localities within the Designated area. In case where there is a restriction to access in the designated area that was not permanent or not intimated to the contractors at the time the bid was submitted and is not attributable to the contractor, the AM shall make all attempts to remove such obstructions at the earliest. If however such restriction/obstruction persists for a period of more than 15 days, the AM shall look into the suitably substantiated claims, for additional compensation if any, submitted by the contractor for the alternate MSW evacuation plan adopted by the contractor in the affected area. The claims which are not suitably settled by AM within 30 days period can be referred by the contractor to the expert or to arbitration . However permanent changes to access brought about by private parties exercising their legitimate property rights shall not place any fresh obligations on AM.

11 Service quality and penalties for defaults in service delivery

11.1 AM inspections

11.1.1 AM shall conduct random inspections of the Designated area. The identities of the inspectors appointed by AM for conducting such inspections shall be informed to the Contractor.

11.1.2 Complaints, if any, shall be recorded by the AM inspectors or public in the complaint book at the Complaint Desk of the Contractor and the complaint book shall be made accessible to them.

11.2 Resolution of Complaints

11.2.1 If a complaint arises from the Contractor's breach of his service obligations, the Contractor shall cure such breach within 24 (twenty-four) hours of its receipt of details regarding such complaint

11.2.2 If a complaint arises from the Contractor's failure to perform his service obligations for reasons beyond its control, the Contractor shall perform such services as soon as reasonably practicable

11.2.3 If a complaint arises despite the Contractor's performance of his service obligations the Contractor and AM shall resolve problems through discussions.

11.3 Performance Evaluation Committee

11.3.1 The AM shall constitute a committee called the Performance Evaluation Committee to examine the performance of the contractor. The AM shall provide the Contractor with a list of all Performance Evaluation Committee members and update that list periodically to reflect changes in membership

11.3.2 The Contractor shall provide the Performance Evaluation Committee with the details of complaints received and action taken to resolve these complaints.

11.3.3 Performance evaluation committee shall analyse the causes for the complaints and suggest methods to the contractor to improve his operations. The Performance Evaluation Committee shall also evaluate the redressal of complaints by the Contractor and decide on the levy of penalties. It shall provide the Contractor an opportunity to present any objection to the levy of such penalties.

11.3.4 If the Contractor is not satisfied with the verdict of the committee, he may then appeal to the Commissioner, AM, whose decision shall be final.

11.3.5 The mechanism of complaint resolution may be periodically reviewed and modified by mutual consent of AM and the Contractor

11.4 Penalties

The following penalty will be levied provided:

- The total number of recorded complaints due breach of service obligations on part of the contractor, which have remained unresolved for a period exceeding 24 hours, are on the rise.
- In the view of the performance evaluation committee there is visible accumulation of MSW awaiting evacuation in the designated area

The penalty shall be 20% of payment that would have been due otherwise for quantity short of the average daily MSW disposed over a period of immediately preceding 30 days assessed as defect free by the performance evaluation committee. **This penalty will be levied on a day to day basis**. If 30 trouble free days are not available for the performance evaluation committee there shall be an assessment based on data available for a shorter time of up to a week. If data even such short periods are not available as is likely during the initial days of the operation the shortfall in quantity shall be assessed by the performance evaluation committee. The Penalties will be waived by the AM during the Hand over Period.

12 Periodic Reports

12.1 The Contractor shall, within 15 days from the end of each month furnish to AM a statement containing the list of complaints, along with a short description of the nature and cause of each complaint recorded by the public, AM Inspectors and all other complaints recorded at the Complaint Desk of the Contractor and the action taken by the Contractor to rectify each complaint

13 Billing and payment

13.1 Measurement

AM shall make arrangements at the Disposal Area to weigh the MSW disposed by the Contractor by the vehicles described in its Proposal / Plan of Action, and to deliver a receipt for each vehicle. The receipt shall be issued in printed form and signed by an authorised representative of AM. It shall identify the vehicle (capacity, type and registration number) and indicate the load in kilograms or tons, the date and the time of delivery. One copy shall be retained by AM.

13.2 Billing

13.2.1 The Contractor shall, not later than the 5th (fifth) working day of every month, submit an Invoice with enclosures of receipts of delivered MSW at the Disposal Area in the previous month and the amount of reimbursement due to him for the same.

13.2.2 The reimbursement claimed by the Contractor from the first day of effective start of operations, shall be calculated at the rates filled in at the time of submission of the bids.

13.2.3 The Invoice submitted by the Contractor shall be based on the measurement of MSW carried out at the Disposal Area

13.2.4 In case of failure of the weighing apparatus on any day (full or part) the MSW shall be weighed at the nearest weigh bridge authorised by AM. The cost of weighing shall be reimbursed by AM on production of the bills. One copy of the weigh bridge slip specifying the details stated in clause 13.1 shall be handed over to AM.

13.3 Additional Payment to the Contractor

13.3.1 The Contractor shall provide AM data on the daily collection and disposal of MSW in the Designated area

13.3.2 AM may, after the end of the Hand over Period, offer MSW collected from areas other than the Designated area at a suitable location to make good the minimum average daily quantity of MSW, defined under Clause 1 of the contract conditions. The Contractor shall be obligated to dispose this MSW at the Disposal Area with the MSW disposed by the Contractor in the regular course of operation for which the Contractor shall be reimbursed at the same rate as for MSW disposed by him in the regular course of operations.

13.3.3 In the event that the disposal of MSW from the Designated area is below the Minimum Average Daily Quantity, for reasons not attributable to the defaults of the contractor, the AM shall compensate the Contractor for the shortfall in quantity at the rate quoted. No compensation shall be paid by the AM to the Contractor in accordance with this clause during the Hand over Period.

13.3.4 The period for which the Contractor claims compensation according to clause 13.3.3 shall subsequently be excluded when the Minimum Average Daily Quantity of MSW is recalculated subject to the mutual consent of AM and the contractor.

13.4 Payment

13.4.1 AM shall, within 15 (fifteen) days of receiving the Invoice, pay the amount due to the Contractor as per the Invoice, after deducting the Penalties as per clause 11.4 of the contract conditions.

13.4.2 Late payments i.e. payments made by AM, more than 30 (thirty) days after the receipt of the Invoice shall bear an interest of 12% for the period of delay beyond thirty days.

13.4.3 Tax will be deducted at source as per provisions of Income Tax Act 1961.

13.5 Letter of Credit

13.5.1 AM shall provide an irrevocable stand by Letter of Credit as per rules in force and RBI guidelines, issued in favour of the Contractor by a bank or banks reasonably acceptable to the Contractor. The first LoC shall however be provided by AM only on start of operations. AM shall no later than twenty (20) days prior to the date upon which any letter of credit provided pursuant to this clause is expressed to expire provide the Contractor with an irrevocable revolving letter of credit issued in favour of the Contractor by a bank or banks in India reasonably acceptable to the Contractor, on the basis that:

a. the Contractor may draw upon the AM Letter of Credit for payment of a monthly Invoice by presenting to the issuing bank a copy of the unpaid Invoice that has been delivered by the Contractor to the AM in accordance with this Contract; and

b. the value of a AM Letter of Credit shall be equal to 110% (one hundred and ten percent) of one succeeding monthly payment, calculated for the purpose of the value of the Letter of Credit as follows:

- for the first three months following the date of Start of Operations the value of the Letter of Credit shall be calculated for a MSW Quantity of 15 metric tonnes per day, at the rate of reimbursement as quoted in the contractors bids
- for the remaining portion of the contract LoC shall be calculated for a MSW quantity equal to the average monthly quantity collected and disposed by the contractor for the immediately preceding three months at the rate quoted

c. the AM Letter of Credit shall be fully revolving so that it will be automatically renewed for its full value upon each call made on the Letter of Credit

13.5.2 The Contractor may transfer each AM Letter of Credit to or for the benefit of the Lenders' representative on behalf of the Lenders.

14 Project assets

14.1 Ownership of Project Assets

14.1.1 The Contractor shall procure and own certain assets required for the work, including without limitation vehicles and other movable property and any fixed assets that in the view of the contractor are needed for the work, to be located in the Vehicle Workshops, on land owned by AM

14.1.2 AM hereby provides the Contractor rent-free rights to enter, improve, use and enjoy the land and improvements constituting the demarcated area of the Vehicle Workshops only for the purpose of the work arising out of this Contract, which rights shall remain valid and subsisting until termination or expiry of this Contract. The contractor shall not sublet the premises or carry out jobs other than those arising put of this contract.

14.1.3 The Parties agree to execute such instruments and filings as may in the opinion of either of them be necessary or advisable to confirm such rights.

14.2 Access to Vehicle Workshops

Vehicles and other movable property owned by the Contractor may enter onto or be stored on or in the Vehicle Workshops, provided the Contractor shall remove such property therefrom reasonably promptly after termination or expiration of this Contract. AM agrees to provide continued access and rights to the Contractor for Contractor vehicles and property located at Vehicle Workshops for a reasonable period after termination or expiration of this Contract to ensure that the Contractor may implement an orderly transition of his business. The reasonable transition period shall be decided by the Commissioner, AM

14.3 Ownership of Project Assets on termination or expiry of Contract

14.3.1 The Contractor shall remain the owner of his vehicles and other movable property located at the Vehicle Workshops and elsewhere notwithstanding the termination or

expiration of this Contract. The Contractor shall be free to relocate or dispose of any such vehicles or other movable property at his sole discretion upon termination or expiration of this Contract and may explore with AM sale thereof to AM

14.3.2 The Contractor shall remain the owner of his fixed assets and improvements attached or constructed at the Vehicle Workshops and elsewhere notwithstanding termination or expiration of this Contract. AM hereby waives all rights arising at law to own, use or exclude others from access or use of any such fixed assets and improvements and agrees to execute such instruments and filings as may in the opinion of the Contractor be necessary or advisable to contain such waivers during the period of Contract.

14.3.3 Recognising the Contractor's ownership of fixed assets and improvements to be located in Vehicle Workshops and AM's ownership of land burdened by such fixed assets and improvements, it is agreed that in event of termination of this contract for any reasons, the Contractor is granted an option, exercisable once by notice to AM not more than 90 days after termination of this Contract requiring AM's purchase at book value all of the Contractor's fixed property and improvements located on or in Vehicle Workshop land and buildings. For purposes of the foregoing, "book value" shall assume straight line amortisation of such assets values over five years. The detailed bill of quantities of such fixed asset created, based on the PWD basic schedule of rates prevailing in the year of start of operations shall be furnished by the contractor with the request for fixed asset take over by AM. If for any item PWD schedule of rates are not available, the rates available in other central/state government basic schedule of rates shall be adopted. Items not covered by any government schedule of rates are not permitted in costing the fixed assets requested for take over. The AM shall verify the reasonableness of the costing of the fixed assets created and intimate the contractor of the cost at which it is willing to take over with reasons for deviations from the contractors proposal. If the decision of the AM as to the right value of the fixed asset is not accepted by the contractor the matter may be referred for arbitration by the contractor.

14.3.4 Upon expiration of this Contract the Contractor shall cause transfer to AM for no consideration, all of its fixed assets and improvements (but not vehicles or movable property) located on or in Vehicle Workshop land and buildings except such parts thereof as the Contractor has advised AM it wishes to remove. The removal of parts of the building shall be allowed only if AM is convinced that such removal shall not affect the fixed assets that it was owning in the demarcated areas of the vehicle workshop, prior to the start of the contract.

15 Force majeure

15.1 Definition of Force Majeure

15.1.1 Force Majeure shall mean any event or circumstance or combination of events or circumstances set out below that materially and adversely affects any Party in the performance of its obligations in accordance with the terms of this Contract, but only if and to the extent that such events and circumstances are not within the affected Party's reasonable control, and/or the effects of which the affected Party could not have prevented through prudent business practices or, through reasonable skill and care, including through the expenditure of reasonable sums of money:

(i) the effects of any natural element or other Act of God, including but not limited to any rain storm leading to flooding of the Designated area, lightning, earthquake, cyclone or other natural disaster;

(ii) fire or explosion, each case not being due to (A) inherent defects of the equipment used for the work (B) the failure to execute the work in accordance with prudent business practices of (C) circumstances within the reasonable control of the affected Party's contractors;

(iii) act of war (whether declared or undeclared), sabotage, terrorism or act of public enemy, (including the acts of any independent unit or individual engaged in activities in furtherance of a program of irregular warfare), acts of belligerents or foreign enemies (whether accorded diplomatic recognition or not), blockades, civil disturbance, revolution, rebellion or insurrection, exercise of military or usurped power, or any attempt at usurpation of power;

(iv) strikes, work to rule actions, go slows or similar labour difficulties in the industry or in and around Chennai city as whole and not specific to the work which restrict the Contractor from performing his duties;

(v) any Governmental Agency's unreasonable delay, denial or refusal to grant or renew or any unreasonable revocation of any required permit, license, approval or authorisation, including Governmental Authorisations, provided that such adverse governmental action or inaction did not result from the Contractor's non compliance with any applicable law or any condition to the granting or maintenance of any such permit, license, approval or authorisation that was in effect on the date of signing this Contract;

15.2 Exclusions from Force Majeure

15.2.1 Force Majeure shall expressly not include the following conditions, except to the extent resulting from a Force Majeure;

(a) unavailability, late delivery or changes in cost of plant, machinery, equipment, materials, spare parts or consumables for the work;

(b) a delay in the performance of any contractor or supplier

(c) non-performance resulting from normal wear and tear typically experienced in a work of this kind; and

(d) non-performance caused by, or connected with, the non-performing Party's (i) negligent or intentional acts, errors or omissions, (ii) failure to comply with any of the Laws of India, or (iii) breach of, or default under this Contract.

15.3 Notification Obligations

15.3.1 The Party claiming Force Majeure shall inform the other Party of any event or circumstance of Force Majeure as soon as reasonably practicable. The affected Party shall thereafter furnish weekly reports with respect to its progress in overcoming the adverse effects of such event or circumstances and as soon as reasonably practicable shall submit to the other Party information supporting the claim for relief under this Article.

15.3.2 The Party claiming Force Majeure shall give notice to the other Party of (i) the cessation of the relevant event or circumstance of Force Majeure and (ii) the cessation of the effects of such event or circumstance of Force Majeure on the enjoyment by such Party of its rights or the performance by such Party of its obligations under this Contract as soon as practicable after becoming aware of such cessation.

15.4 Consequences of Force Majeure

15.4.1 Neither Party shall be responsible or liable for or deemed in breach because of any failure or delay in complying with its obligations under or pursuant to this Contract due solely to one or more Force Majeure or its or their effects or by any combination thereof, and the periods allowed for the performance by the Parties of such obligation(s) shall be extended on a day-for-day basis; provided, however, that no relief shall be granted to the Party claiming Force Majeure pursuant to this Clause to the extent that such failure or delay would have nevertheless been experienced by that Party had such Force Majeure not occurred.

15.4.2 Except as otherwise provided in this Article, any time period specified for the performance of any obligation hereunder by the affected Party shall be extended by a period equal to the duration of the Force Majeure event or circumstance provided that the affected Party shall not be entitled to any such extension to the extent that such delay or failure or perform would have occurred, irrespective of the Force Majeure event or circumstance.

15.4.3 Either Party shall have the right to terminate the Contract in the event of pendancy of the Force Majeure conditions for a consecutive period of 180 (one hundred and eighty) days.

15.5 Duty to Mitigate

15.5.1 Each Party shall use reasonable efforts to mitigate the effects of any event or circumstance of Force Majeure and to cooperate to develop and implement a plan of remedial and reasonable alternative measures to remove the event of Force Majeure. The Party affected by and event of Force Majeure shall make it best efforts to resume normal performance of its obligations under the Contract as soon as possible.

16 Change in law

16.1 If as a result of change in Law, the Contractor suffers a reduction in net after tax return the aggregate financial effect of which exceeds 2.5% of his projected profits, in any Accounting Year, the Contractor may notify AM and propose amendments to this Contract so as to put the Contractor in the same financial position in terms of net after tax return as it would have occupied had there been no such change in Law.

16.2 Upon notification by the Contractor as aforesaid, the Parties shall meet as soon as reasonably practicable but no later than 30 (thirty) days and agree on amendments to the rates to implement the foregoing.

16.3 Provided that if no contract is reached as aforesaid by the Parties within 90 (ninety) days of the meeting pursuant to this Clause the Contractor may by notice in writing require AM to pay in an amount that would put the Contractor in the same financial position it would have occupied had there been no such change in Law resulting in reduction in net after tax return as aforesaid.

16.4 If as a result of change in Law, the Contractor enjoys an increase in net after tax return the aggregate financial effect of which exceeds 2.5% of his projected profits, in any Accounting Year, the AM may notify the Contractor and propose amendments to this Contract so as to put the Contractor in the same financial position in terms of net after tax return as it would have occupied had there been no such Change in Law.

16.5 Upon notification by the AM as aforesaid, the Parties shall meet as soon as reasonably practicable but no latter than 30 (thirty) days and agree on amendments to rates to implement the foregoing.

16.6 Provided that if no contract is reached as aforesaid by the Parties within 90 (ninety) days of the meeting pursuant to this Clause, AM may by notice in writing require the Contractor to pay an amount that would put the Contractor in the same financial position it would have occupied had there been so such change in Law resulting in increase in net after tax return as aforesaid.

16.7 If AM (or the Contractor) shall dispute the quantum of such compensation claims of the contractor (or the AM), the same shall be finally settled in accordance with the Dispute Resolution Procedure.

17 Representations and warranties

17.1 The Contractor represents and warrants to AM that:

(a) the Contractor has full power to carry on its business and to enter into, legally bind itself by, and perform its obligations under, this Contract;

(b) this Contract has been duly authorised, executed, and delivered by the Contractor after fulfilling all legal formalities and constitutes its legal, valid and binding obligation;

(c) the execution, delivery, and performance of this Contract, does not constitute a violation of (i) any statute, judgement, order, decree or regulation or rule of any court, governmental authority or arbitrator of competent jurisdiction applicable or relating to the Contractor, its assets or its businesses, and (ii) the Contractor's Articles of incorporation or other organic documents or any indenture, contract or contract to which it is a Party or by which it or its property shall be bound;

(d) there are no outstanding judgements against the Contractor or its Initial Shareholders, and, to the best knowledge of the Contractor, no action, claim, suit or proceeding is pending or threatened against the Contractor or its initial Shareholders before any court, governmental authority or arbitrator of competent jurisdiction that could reasonably be expected to affect materially and adversely the financial condition or operations of the Contractor or the ability of the Contractor to perform its obligations under this Contract;

(e) the Contractor is not in default under any contract to which it is Party or by which it or its property shall be bound, nor in any material default of any obligation, which could have a material adverse effect on the ability of the Contractor to perform its obligations under this Contract; and

(f) no information given by the Contractor in relation in this Contract contains any material misstatement of fact or omits to state a fact which would be materially adverse to the enforcement of the rights and remedies of AM or which would render any statement, representation or warranty contained herein incorrect.

17.2 AM hereby represents and warrants to the contractor that:

(a) it is duly created pursuant to statute, existing and has, so far as is material to the Contractor, complied fully with all applicable Laws of India, and that there are no proceedings pending, or to the best of its knowledge, threatened of any dissolution of AM;

(b) this Contract has been duly authorised, executed, and delivered by AM after fulfilling all legal formalities and constitutes its legal, valid and binding obligation;

(c) the AM has full power to carry on its business and to enter into, legally bind itself by, and perform its obligations under, this Contract;

(d) the execution, delivery, and performance of this Contract, does not constitute a violation of (i) any statute, judgement, order, decree or regulation or rule of any court, governmental authority or arbitrator of competent jurisdiction applicable or relating to the AM, its assets or its businesses, and (ii) The Tamil Nadu District Municipalities Act, 1920 by which the AM is bound;

(e) there are no outstanding judgements against AM and, to the best knowledge of AM, no action, claim, suit or proceeding is pending or threatened against AM before any court, governmental authority or arbitrator of competent jurisdiction that could reasonably be expected to affect materially and adversely the financial condition or operations of AM or the ability of the AM to perform its obligations under this Contract;

(f) no information given by AM in relation to this Contract contains any material misstatement of fact or omits to state a fact which would be materially adverse to the enforcement of the rights and remedies of the Contractor or which would render any statement, representation or warranty contained herein incorrect.

18 Events of default and termination

18.1 Events of default

18.1.1 Save as otherwise provided in this Contract, the Contractor shall be in a default of his obligations when:

(a) the Contractor attempts to collect MSW from any area other than the Designated area without the written consent of the AM;

(b) in case the Contractor disposes the MSW collected into any area other than the Disposal Area, without the written consent of AM;

(c) in case any license or consent required by the Contractor to perform its obligations under the Contract is revoked or is not renewed;

(d) in case the Contractor abandons the work or repudiates the Contract;

(e) in case the Contractor commits any other breach of the Contract and, where the breach is capable of being remedied, it has not been remedied within 10 (ten) days after AM notified to the Contractor in writing of the nature of the breach and required it to be remedied.

18.1.2 Save as otherwise provided in this Contract, AM shall be in default of its obligations when:

(a) in case AM commits any breach of the Contract other than the breach of its payment obligations and where the breach is capable of being remedied, it has not been remedied within 10 (ten) days after the Contractor notified to the AM in writing of the nature of the breach and required it to be remedied;

(b) in case AM fails to make payment to the Contractor within 60 days of receipt of the relevant Invoice.

(c) in case a Letter of Credit is not in effect at any time as required under this Contract.

18.2 Notice of default

18.2.1 Upon the occurrence of a Contractor Event of Default or a AM Event of Default, as the case may be, AM or the Contractor, shall deliver a notice to the other Party

("Notice of specifying in reasonable detail the Contractor Event of Default or the AM Event of Default", as the case may be,) giving rise to the Notice of Default. The Contractor shall send to GoTN a copy of any Notice of Default in case of an AM Event of Default.

18.2.2 In the event of receipt by either Party of a Notice of Default, such Party shall within 5 (five) Days state in writing to the other Party its position as to the alleged Event of Default and what action it plans (including the timing thereof), if any, to remedy such default.

18.2.3 15 (fifteen) days after delivery of the Notice of Default by the Contractor for any AM Event of Default and unless AM Event of Default giving rise to the Notice of Default shall have been remedied, the Contractor may at any time terminate the Contract by issuing a termination notice to AM ("Contractor Notice of Termination"). The Contractor shall send to GoTN a copy of any Contractor Notice of Termination.

18.2.4 15 (fifteen) days after delivery of the Notice of Default by AM for any Contractor Event of Default and unless the Contractor Event of Default giving rise to the Notice of Default shall have been remedied, AM may at any time terminate the Contract by issuing a termination notice to the Contractor (a "AM Notice of Termination").

18.3 Consequences of Default

18.3.1 In the event the Contractor gives a Contractor Notice of Termination to AM, then the Performance Guarantee given by the Contractor shall be released and AM shall make the payment for reimbursement of MSW collection disposal if any, due to the Contractor, as on the date of notice of termination.

18.3.2 In the event AM gives the Contractor an AM Notice of Termination, then unless the Parties otherwise agree in writing, the Contractor shall not be compensated in any manner whatsoever and Performance Guarantee shall be liable to be forfeited and encashed. AM shall make the payment for reimbursement of MSW collection disposal if any, due to the Contractor, as on the date of notice of termination.

19 Dispute resolution

19.1 Nature of Dispute

19.1.1 If any dispute arises between AM and the Contractor in connection with or arising out of or in relation to the Contract, the affected Party shall issue a Dispute Notice to the other Party giving a description of the nature of dispute.

19.1.2 Each Party shall attempt to settle such dispute amicably within ten (10) days of the issue of the Dispute Notice.

19.2 Expert Determination

19.2.1 If a dispute cannot be settled amicably within period specified in Clause 19.1.2, then the same shall be referred to an Expert for determination.

19.2.2 Any Party may refer the dispute to an Expert by giving a written notice (a "Referral Notice") to the other Party. The Party giving a referral notice is the "Applicant" and the Party receiving such notice is the "Respondent".

19.2.3 A Referral Notice shall contain:

(a) a description of the dispute;

(b) the grounds on which the Applicant relies in seeking to have the dispute determined in its favour;
(c) all written material which the Applicant proposes to submit to the Expert; and
(d) the names of not less than three individuals who meet the requirements and whom the Applicant would be willing to accept as the Expert for that dispute.

19.2.4 The Expert shall certify that he or she is not subject to any conflict of interest and is willing to serve as an Expert on the terms set out.

19.2.5 If the Respondent wishes to contest the dispute, he shall, within seven (7) days after receiving the Referral Notice give the Applicant a notice (a "Response") of its intention to contest the dispute. The Response shall include:

(a) the grounds on which the Respondent relies and seeks to have the dispute determined in its favour.
(b) all written material that the Respondent proposes to submit to the Expert; and
(c) which, if any, of the Experts proposed by the Applicant are acceptable to the respondent and, if no such Experts are acceptable, not less than three individuals meeting the requirements to whom the Respondent would be willing to refer the dispute.

19.2.6 If an Expert acceptable to both Parties is selected within seven (7) working days after the applicant's receipt of the response, the dispute shall be referred to the chosen expert. If no expert is chosen within that period, the dispute shall be settled by arbitration.

19.2.7 Unless the Parties otherwise agree:

(a) the Expert shall give the Parties not less than seven (7) days prior notice of the time and place at which the Parties shall be given an opportunity to present their case to the Expert;
(b) the place for hearing the dispute shall be in Chennai;
(c) the date of the hearing shall be not more than fourteen (14) days after the Expert was appointed;
(d) at the time nominated for the hearing, each Party shall appear before the Expert to present its case;
(e) the Parties shall not be entitled to have access to the other Party's records or data in connection with the dispute except as expressly provided in the Contract.
(f) the Expert may permit a Party to use or produce documents not referred to in the Referral Notice or, as the case may be, the Response if he or she believes it is fair and equitable to do so, provided that the other Party shall be given a reasonable opportunity to respond to such documents;
(g) the Expert shall render his or her decision on the dispute as soon as possible after completing the hearing and shall advise the Parties in writing of the reasons for that decision;
(h) the hearing shall not be regarded as an arbitration and the procedural rules governing arbitration shall not apply to it;
(i) no admissions or other statements made by a Party during the course of any hearing for an Expert may be used as evidence in any other proceedings.
(j) the Expert's fees and expenses shall be shared equally by the Parties

19.2.8 The Expert's decision shall be advisory only and shall not be binding upon either Party unless the Parties enter into a written stipulation agreeing to be bound by the Expert's decision.

19.2.9 If the Expert does not reach a decision within 30 (thirty) days of his appointment or such longer period as the Parties may agree in writing, either Party may terminate the Expert's appointment by giving a notice of termination to the other Party and the Expert. Unless a new Expert is appointed within seven (7) days after termination of the previous Expert's appointment, the dispute shall be resolved by arbitration in accordance with Clause 19.3.

19.3 Arbitration

19.3.1 In the event that the Parties are unable to resolve a dispute, controversy or claim within 30 (thirty) days of the appointment of the Expert, then either Party may give notice to the other of its intention to appoint Arbitrators.

19.3.2 In case no Expert is appointed by the Parties for resolution of the dispute, then at any point of time after a dispute arises, either Party may give notice to the other of its intention to appoint Arbitrators

19.3.3 Within 7 days of the receipt of the notice of intention to appoint Arbitrators, the AM and the Contractor shall appoint an Arbitrator each. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the President of the Institution of Engineers (India), Tamilnadu Chapter, Chennai.

19.3.4 If one of the parties fails to appoint its arbitrator in pursuance of the above within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the President of the Institution of Engineers (India), Tamilnadu Chapter, Chennai, shall appoint the arbitrator. A certified copy of the order of the President of the Institution of Engineers (India), Tamilnadu Chapter, Chennai., making such an appointment shall be furnished to each of the parties.

19.3.5 The arbitration proceedings shall be conducted in the English language and shall be held in accordance with the provisions of the Indian Arbitration and Conciliation Act, 1996 and such arbitration proceedings shall take place in Chennai.

19.3.6 The award of the Arbitrators shall be reasoned one giving reason for each claim allowed for and disallowed for. The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.

19.3.7 Performance under the contract shall continue during the arbitration proceedings and payments due to the contractor by the owners shall not be withheld, unless they are the subject matter of the arbitration proceedings.

19.3.8

19.4 Waiver of Sovereign Immunity

AM unconditionally and irrevocably agrees:

19.4.1 that the execution, delivery and performance by it of this Contract constitute private and commercial acts rather than public or governmental acts;

19.4.2 waives any right of immunity which it or any of its assignees now has or may acquire in the future in any jurisdiction

19.3.3 consents generally in respect of the enforcement of any judgement against it in any such proceedings in any jurisdiction to the giving of any relief or the issue of any process in connection with such proceedings (including, without limitation, the making, enforcement or execution against or in respect of any property irrespective of its use or intended use)

20 Miscellaneous clauses

20.1 Indemnification

20.1.1 The Contractor shall indemnify the AM against all losses and claims in respect of:

(a) death or injury to any person including employees of the AM or the employees of the Contractor directly due to the negligence or wilful misconduct of the Contractor, but only if and to the extent of such negligence or wilful misconduct;

(b) loss of or damage to any property directly due to the negligence or wilful misconduct of the Contractor, but only if and to the extent of such negligence or wilful misconduct;

(c) any other risks specifically to be covered as may be agreed by the parties after the date of this Contract which may arise out of or in connection with the work against all related claims, demands, proceedings, damages, costs, charges and expenses due to a reasons attributable to the Contractor.

20.1.2 The Contractor shall protect and indemnify the AM against any claim or liability arising directly from or based on the violation of any laws, rules, regulations or bylaws, whether by himself or by his employees.

20.1.3 The AM shall indemnify the Contractor against all losses and claims in respect of:

(a) death or injury to any person including employees of the AM or the employees of the Contractor directly due to the negligence or wilful misconduct of the AM, but only if and to the extent of such negligence and misconduct;

(b) loss of or damage to any property due to a reasons attributable to the AM;

(c) any other risks specifically to be covered as may be agreed by the parties after the date of this Contract which may arise out of or in connection with the work against all related claims, demands, proceedings, damages, costs, charges and expenses due to a reasons attributable to the AM.

20.1.4 The AM shall protect and indemnify the Contractor against any claim or liability arising from or based on the violation of any laws, rules, regulations or bylaws, whether by itself or by its employees.

20.1.5 All transport vehicles shall be insured and copy of the insurance policies furnished to AM for perusal and record.

2.2 Assignments; Security Interests

20.2.1 Except as provided in the Contract, neither Party shall, without the other Party's prior written consent, transfer, assign or grant any form of security over the Contract or any of their obligations, rights or benefits under the Contract as may be agreed

by the parties after the date of this Contract. Any purported transfer, assignment or security interest granted without the other Party's consent shall have no effect.

20.2.2 The Contractor shall have the right, after written notice of 15 (fifteen) days to the AM, to assign any or all of its rights and interests under this Contract to the Financing Parties as security for its obligations under the Financing Documents, which assignment shall not relieve the Contractor of its obligations under this Contract. The AM shall execute all such consents and/or acknowledgements of any such security granted by the Contractor to the Financing Parties, as the Contractor may reasonably request or as may be agreed to make such security effective.

20.3 Transfer by AM to a successor company

20.3.1 The AM shall be entitled to transfer its rights and obligations under the Contract to any entity provided the GoTN confirms the same in writing to the Contractor.

20.3.2 The Parties shall cooperate in signing all such acknowledgements and novation contracts necessary to give effect to a subletting, assignment, transfer or creation of security/interest permitted by this Clause.

20.4 Governing Law

20.4.1 The Contract shall be governed by and construed in accordance with the laws of the Republic of India and other applicable laws in the State of Tamil Nadu; Courts in the State of Tamil Nadu shall have exclusive jurisdiction.

20.5 Notices

20.5.1 All notices to be given under the Contracts shall be in writing and in the English language. All certificates, notices or written instructions to be given under the Contracts to a Party other than any certificates, notices or written instructions that are to be given in accordance with the Dispatch Procedures shall be delivered by hand, sent by post or transmitted by cable, telefax or telex as follows:

If to the Contractor – for attention of ----------

If to AM – for the attention of Commissioner, Alandur Municipality, No 1, New Street, Alandur , Chennai – 600 016.

Either Party may change any of the details set out in this Clause by giving notice of the change to the other Party. Notices shall be effective when received by the intended recipient. Notices given by post shall be deemed to have been received seven (7) days after they were deposited in the post, properly addressed and with appropriate postage prepaid. Notices given by telefax shall be deemed to have been received within two (2) hours after transmission if transmitted during normal business hours at the place of receipt or otherwise at 11 a.m. on the next business day at the place of receipt and transmission of the notice shall be confirmed by the transmission report unless the recipient shall have promptly notified the sender in writing that notice was not legible.

20.6 Alandur Municipality shall instruct the hospitals to follow the instruction given for segregation of biomedical waste. The Contractor shall not be held responsible if the waste picked up from the hospitals includes some biomedical waste. The liability for the disposal of biomedical waste shall rest with the hospitals. However, the contractor shall report to the AM, the details of the hospitals which do not segregate and remove biomedical waste whenever it comes to the Contractor's notice so that AM could initiate necessary action.

Section 6

Section 7

All inclusive reimbursement per ton of MSW collected and disposed by the Contractor in Indian rupees per MT Rs.----------/MT (Rupees ---------- per metric tonne)

(in figures) (in words)

PERFORMANCE BANK GUARANTEE

To: Alandur Municipality

_____ *[address]*

WHEREAS _____ *[name and address of Contractor]*

(hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____

dated _____ to execute _____ *[name of Contract*

and brief description of Works] (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of _____ *[amount of guarantee]*[1] _____ *[in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ *[amount of guarantee]*[1] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until 30 days after the contract period or the end of contract which ever is later

Signature and seal of the guarantor _____
Name of Bank _____
Address _____
Date _____

1 An amount shall be inserted by the Guarantor, as specified in clause 4.1 of the Conditions of Contract denominated in Indian Rupees.

AGREEMENT FORM

This Contract made the ------day of -------,2001 between Alandur Municipality, Alandur, established under the Tamil Nadu District Municipalities Act, 1920 and represented by its Commissioner (hereinafter referred to as "AM" which expression unless the context otherwise requires shall include its successors in interest and assigns) of the one part

and

---------- (name and address of the contractor) (hereinafter referred to as "Contractor" which expression unless the context otherwise requires shall include its successors in interest and permitted assigns) of the other part.

WHEREAS the Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL) had invited bids, on behalf of the AM, through Competitive Bidding Process, for collection and disposal of municipal solid waste from the designated Area.

WHEREAS the Contractor among others, had submitted bid for the aforesaid work and after evaluation was selected and intimated by AM vide letter No.------ dated ------2001

WHEREAS the aforesaid work required the Contractor entering into a Contract with AM

NOW THIS CONTRACT WITNESSETH as follows:

1. In this Contract, words and expression shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Contract.
2. In consideration of the payments to be made by the AM to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the AM to execute service contract Work and remedy any defects therein in conformity in all aspects with the provisions of the Contract.
3. AM hereby covenants to pay the Contractor in consideration of the delivery of the service contract work and the remedying the defects wherein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
4. The following documents shall be deemed to form and be read and construed as part of this Contract, viz.:

   i) Letter of Acceptance;

   ii) Contractor's Bid including the initial plan of action, the price quote;

   iii) Conditions of contract

   iv) Plans

In witness whereof the parties thereto have caused this Contract to be executed the day and year first before written.

The Common Seal of

_____

was hereunto affixed in the presence of:

Signed, Sealed and Delivered by the said _____
_____
_____

in the presence of:

Binding Signature of AM

_____ ___

Binding Signature of Contractor

_____

ANNEXURE VI

NORMATIVE STANDARDS

WASTE GENERATION:

Norms For Generation Of Garbage

Garbage generated	Average Waste
(1) Population range upto 1 lakh (2) Population range 1 to 5 lakh (3) Population range 5 to 10 lakh (4) Population range 10 to 20 lakh	**0.21 Kg per person per day** **0.31 Kg per person per day** **0.45 Kg per person per day** **0.57Kg per person per day**
Street sweepings and drain silt	**0.10 Kg per person per day**
Slaughter House: (1) Small slaughter house (2) Medium slaughter house (3) Large slaughter house	 **0.5 to 1.0 ton per day** **2 to 6 ton per day** **6 to 7 ton per day**
Domestic waste from Hospitals/Clinics	**1.1 Kg per bed per day**

COLLECTION:

Normative Standards For Street Sweeping And Collection Of Municipal Solid Waste (4 Hours)

1. Average road width .. 80 ft. .. One worker / 350 mtrs length
2. Average road width .. 60 ft. .. One worker / 500 mtrs length
3. Average road width .. ?40 ft. .. One worker / 750 mtrs length

Street sweeping which includes roadside drain cleaning and Waste to be collected by primary / secondary transport vehicle and to be sent to storage facility/ landfill - dump site.

Primary Collection of Waste:

For Slums and BPL settlements:

- One 40 litre –HDPE bin to be placed for every unit of 100 people of the area.(approximately 20 households)
- Approximate weight of waste per bin would be 15 Kgs
- One push cart/tricycle to be provided for transfer of waste from the bins to push cart
- Then the waste from the push carts/tricycles or from 40 litre collection bins to be transferred to nearest secondary container.

Normative Standards for operation:

a) **Push Cart:**
   - One push cart (Capacity - 40 to 50 Kgs) can hold waste from 3 or 4 bins
   - Approximate time taken for one such operation for delivering to secondary container - 30 minutes

Depending on operational distance and travel time, quantity of waste and number of houses handled would vary.

b) **Tricycle:**
   - One tricycle (Capacity - 80-100 Kgs) can hold waste from 4-6 bins
   - Approximate time taken for one such operation for delivering to secondary container – 45 minutes
   - Recyclables to be delivered to a separate transport system using existing vehicles like tippers and tractor trailers at pre determined time schedules**.**

From Non Slum residents:

a) **Auto Tipper:**
   - The auto tipper would stop at every 50 m
   - The segregated green waste is to be delivered by the residents to the vehicle either on move or stationary, at 50m distance intervals
   - Atleast 10 houses can be handled at each stop.
   - Time taken at every stop including transverse is 3 minutes
   - Time take by auto tipper for collection from 500 houses before 1st transfer of waste to secondary container =2½ to 3 hours
   - Time duration for collection from 1000 houses = 6 hours.(6.30 AM to 1.30PM) with one hour break in between.

The waste collected from auto tippers would be transferred directly to 3cum/4.5cum secondary container.

b) **Push Cart**
   - One push cart can cover about 160 houses in a shift
   - Push Cart can collect waste from 40 houses in a trip
   - After each trip, the waste is delivered to the secondary container
   - Time required for one trip will be 90 minutes
   - One person is required for the operation of waste collection

c) **Tricycle**
   - One tricycles can cover 240 houses in a shift (6Hour)
   - Tricycle can collect waste from 80 houses in one trip
   - After each trip, the waste is delivered to the secondary container
   - Time required for one trip will be 2 hours
   - In a 6 hour shift 240 houses can be covered
   - One person is required for the operation of waste collection

Collection from Commercial Establishments:

- Waste to be collected during afternoon soon after green waste collection from houses
- Time duration for collection -1-2 hours approximately (10% of the houses)

Collection from Bulk waste generators:

- Waste generators to make their own provisions as per specified storage container for storage of waste and to synchronise its collection and transport system
- Waste generators may also arrange for storage and transport of waste under contract management
- Separate fee can be collected for handling the above waste

Recyclable Waste Collection- from houses:

- Periodical collection on scheduled days and at a specific time-once/twice in a week
- Waste so collected would be delivered to a specified collector of recyclable waste

- In the absence of an established collection system by the recycling operators, the ULB has to store the waste at the disposal site and make arrangements for recycling agencies to collect the waste

SECONDARY COLLECTION:

Normative Standards:

- Secondary containers are to be transported either by Dumper placer/ Tractor/Tipper as per recommendation based on the size and suitability of ULB
- Dumper Placers/Compactors are to be provided for cities with a population more than 1 lakh and more and distance from the town to the disposal site is more than 10 km
- The green waste and predominantly biodegradable waste to be transported to treatment facility/disposal site as per arrangement
- The inorganic waste only has to be transported directly to landfill site
- One twin container Dumper placer would be required to make 5 trips in shift to treatment / disposal site with an average one way load of 10 km
- ULB to procure the vehicle and operate the system

ULB to operate the system on contract basis with the operator providing the designated type of vehicle

நகராட்சி சேவைப் பணிகள் – தனியார் மயமாக்கல் – வழிகாட்டு நெறிகள் – வெளியிடப்படுகின்றன
நகராட்சி நிர்வாகம் மற்றும் குடிநீர் வழங்கல் (நீதி3) துறை

அரசாணை (நிலை) எண். 69 நாள் 4.5.98

ஆணை:-

1. தமிழ்நாட்டின் மக்கள் தொகையில் 40 சதவிதத்தினர் நகர்ப்புறங்களில் வாழ்கின்றனர். இப்பகுதிகளில் நகராட்சிகளின் சேவைப்பணிகளை பயனுள்ள விதத்தில் திறம்படி வழங்குதல் நகராட்சிகளின் கடமையாகம்.

2. அரசு நகர்ப்புற உள்ளாட்சி அமைப்புகளின் சேவைப்பணிகளை திறம்பட நிறைவேற்றவுள்ள கருவிகளில் ஒன்று தனியார் மயமாக்கல் எனக் கருதப்படுகிறது. சேவைப் பணிகளைப் பிரித்து அவற்றில் தனியார் மயமாக்கப்பட்டால் பயன்விளைவிக்கக்கூடிய பணிகளை மட்டும் தனியாரிடம் ஒப்படைப்பது சாலச் சிறந்தது. அத்தகைய தனியார் மயமாக்கல், எந்தவகையிலும் தனியார் துறையின் ஏகபோகத்திற்கு வழியேற்படுத்தக் கூடாது என்பதும் கவனத்தில் கொள்ளப்பட வேண்டும்.

3. மேலே பத்தி இரண்டில் கூறப்பட்டுள்ள நிலையில் ஒரு கொள்கை அடிப்படையிலான வழிகாட்டு நெறிகளை வெளியிடுவது பயனுள்ளதாக இருக்கும் என அரசு கருதுகிறது. இக்கருத்தின் அடிப்படையில் ஓர் கொள்கைக் குறிப்பு தயாரிக்கப்பட்டு இத்துடன் இணைக்கப்பட்டுள்ளது.

4. கொள்கைக் குறிப்பின் அடிப்படையில் நடவடிக்கை எடுக்குமாறு அனைத்து மாநகராட்சி ஆணையர்கள், நகராட்சி ஆணையர்கள் பேரூராட்சி செயல் அலுவலர்கள் ஆகியோர் கேட்டுக் கொள்ளப்படுகிறார்கள். இதன் மீது எடுக்கப்பட்ட நடவடிக்கை குறித்து நகராட்சி நிர்வாக ஆணையர் / பேரூராட்சி ஆணையர் மூலமாக அரசுக்கு அவ்வப்போது அறிக்கை அனுப்புமாறும் அவர்கள் கேட்டுக் கொள்ளப்படுகிறார்கள்.

(ஆளுநரின் ஆணைப்படி)

எஸ். மாலதி
அரசு செயலாளர்.

பெறுநர்
நகராட்சி நிர்வாக ஆணையர், சென்னை – 5.

தமிழ்நாட்டில் நகராட்சி சேவைப் பணிகளை தனியார் மயமாக்குதல் குறித்து கொள்கைக் குறிப்பு

தமிழ்நாட்டின் நகர்ப்புற பகுதிகளில், மக்கள் தொகையில் 40 சதவீதத்தினர் வாழ்கின்றனர். இப்பகுதிகளில் நகராட்சிகளின் சேவைப்பணிகள் பயனுள்ள வகையிலும், திறம்படவும் நிறைவேறுதல் உறுதி செய்யப்பட வேண்டும். அரசமைப்புச் சட்டத்தின் 74–வது திருத்தத்தை மாநிலம் ஏற்றுக் கொண்டது. சேவைப் பணிகளை திறம்பட நிறைவேற்றுவதில் அரசின் கொள்கை ரீதியான இடையீட்டினைக் குறிக்கும் ஓர் ஆரம்ப அடையாளமாகும். 1996 செப்டம்பர்–அக்டோபர் மாதங்களில் சுமார் 700–க்கும் மேற்பட்ட நகர்ப்புற உள்ளாட்சி அமைப்புகளுக்குத் தேர்தல்கள் நடத்தி முடிக்கப்பட்டன. நகர்ப்புற உள்ளாட்சி அமைப்புகளின் செயலாற்றலை வளர்க்கும் பணியை அரசு தற்போது மேற்கொண்டு வருகிறது.

பயனுறும்வகையில், திறம்படி சேவைப்பணிகளை நிறைவேற்றவுள்ள கருவிகளில் ஒன்று தனியார் மயமாக்கல் என்பதை அரசு ஏற்றுக் கொண்டுள்ளது. இருந்த போதிலும் தேவைப்படின், வேலைப் பணிகளை கட்டவிழ்த்து, குறிப்பாக சிலவற்றை அடையாளங்கண்டு பிரித்தெடுத்து அவற்றை எவ்வகையிலும் அரசின் மேலான நோக்கத்திற்கு குந்தகம் ஏற்படாத வகையில் தனியார் மயமாக்கப்பட வேண்டும். எனவே, ஒவ்வொரு சேவைப்பணியிலும், பின்வரும் அம்சங்கள் தனியார் மயமாக்கப்படக்கூடியவை என அரசால் அடையாளம் காணப்பட்டுள்ளன :–

முதன்மை மற்றும் இதர சேவைப் பணிகள்
பின்வருவன முதன்மை மற்றும் இதர சேவைப்பணிகள் என கருதப்படுகின்றன :–

முதன்மை சேவைப் பணிகள் :–
1. திடக்கழிவு மேலாண்மை
2. தெருவிளக்குகள் பராமரிப்பு
3. சாலைகள் மற்றும் பாலங்கள் பராமரிப்பு
4. குடிநீர் மற்றும் துப்புரவுப் பராமரிப்பு

இதர சேவைப்பணிகள் :–
1. பூங்காக்கள்
2. வணிக வளாகங்கள்
3. சந்தைகள்

<u>இயக்கம் மற்றும் பராமரிப்பு</u>

முதன்மைப் பணிகள் :–

திடக் கழிவு மேலாண்மை :–

நகராட்சியின் திடக் கழிவு மேலாண்மை கீழ்க்கண்ட இன்றியமையாத கூறுகளைக் கொண்டது :–

அ) வீடுகளிலிருந்து திடக் கழிவுகளை – சேகரித்தல்
ஆ) தெருக்களில் குப்பை கூட்டுதல்
இ) பேருந்து நிலையங்கள், சந்தைகளை சுத்தம் செய்தல்
ஈ) குப்பைகளை இடமாற்ற நிலையங்களுக்கு (Transfer Stations) எடுத்துச் செல்லுதல்
உ) இறுதியாக குப்பைகள் கொட்டப்படும் களத்திற்கு (Dumping Yard) எடுத்துச் செல்லுதல்
ஊ)குப்பைக் களங்கள் மேலாண்மை

எ) அழுகக்கூடிய மற்றும் அழுகாத பொருட்களை மறுபயனுக்குத் திருப்புதல்.

மேற்கண்ட ஏழு பணிகளில் (ஆ), (இ), (உ), (ஊ) மற்றும் (எ) ஆகிய பணிகள் தனியார் மயமாக்கக் கூடிய சாத்தியமுள்ளவை. நாள்தோறும் குப்பைகளை வீடுகளில் இருந்தும், தெருக்களிலிருந்தும் மொத்தமாக சேகரிப்பதையும், தெருக்களை சுத்தம் செய்வதையும் மட்டும் நகராட்சிகள் மேற்கொள்ளுவது சாலச் சிறந்தது. அதற்கடுத்து, குப்பைகளை இறுதியாக குப்பைக் கொட்டும் களத்திற்கு ஏற்றிச் செல்வது வரையிலான இடைப்பட்ட பணிகளை தனியாரிடம் விட்டுவிடுதல் நலம். தனியார் மயமாக்கப்படுதல் என்பது தனியார் துறையின் ஏகபோகத்திற்கு வழிவகுக்காமல் இருக்க வேண்டியதை உறுதி செய்தல் வேண்டும். ஏனெனில், தனியார்மயமாக்கல் என்ற கொள்கைக்கே அது எதிரானதாக அமையும். குப்பை கொட்டும் களங்களை மேலாண்மை செய்வதும் குப்பைகளை மறுபயனுக்குத் திருப்புவதும் ஒன்றோடொன்று தொடர்புடையதாக உள்ளதால் அவற்றை தனியார் துறையினர் சிறப்பறிவுத் திறனுக்கே விட்டுவிடுதல் நலமான செயலாகும்.

ஆ) அதேபோன்று பேருந்து நிலையங்கள் மற்றும் சந்தைகளை இரவு நேரங்களில் துப்பரவு செய்யும் பணியை தனியாரிடம் ஒப்பந்த முறையில் விட்டுவிடுவதை சில நகராட்சிகள் சோதனை முறையில் கடைப்பிடித்து வருகின்றன. இம்முறை நல்ல பயன்தரக்கூடியதாக உள்ளது. அத்தகைய ஒப்பந்தங்களில் அகற்றப்பட்ட குப்பைகளின் எடை அளவுக்கேற்ப பணம் வழங்கலாம்.

இ) தெருவிளக்குகள் பராமரிப்பு : தெருவிளக்குகள் பராமரிப்பினை தனியார் மயமாக்குதலை கோவை மாநகராட்சி சோதனை முறையில் செயல்படுத்தியது. இதன்படி குறிப்பிட்ட எண்ணிக்கையில் தெருவிளக்குகள் ஒப்பந்த அடிப்படையில் தனியார் பராமரிப்புக்கு விடப்பட்டன. தரத்தை உறுதிசெய்யும் பொருட்டு விளக்குகளில் இணைப்புப் பாகங்களை உள்ளாட்சி அமைப்பே வழங்கும். இம்முறையை மற்ற நகர்ப்புற உள்ளாட்சி அமைப்புகளும் சோதனை முறையில் கடைப்பிடித்துப் பார்க்கலாம்.

ஈ) குடிநீர் விநியோகம் :–

தற்போது நடைமுறையில் உள்ள திட்டங்கள் எதிலும் நீரேற்று தலைமை நிலையங்கள் பராமரிப்பினையும் பொதுமக்களின் புகார்கள் மீது நடவடிக்கை எடுப்பதையும் கட்டணம் விதிப்பது, வசூலிப்பது போன்ற பணிகளையும் பயனுள்ள வகையில் தனியாரிடம் விடலாம்.

கழிவு நீரகற்றல் :–

பெரும்பாலான நகர்ப்புற உள்ளாட்சி அமைப்புகள் தங்கள் ஆட்சியெல்லைக்குள் வெவ்வேறு அளவில் கழிவு நீர் வடிகால்கள் அமைந்துள்ளன. பெரும்பாலானவை பயனுள்ள வகையில் தூர் எடுக்கப்படாமல் விடப்பட்டுள்ளதால் அவை கொசு உற்பத்திக் களங்களாக மாறி கடுமையான சுகாதாரக்கேடு விளைவிப்பதாய் ஆகிவிட்டன. ஒப்பந்தமுறை மூலம் இவ்வடிகால்களை தூர் எடுக்கும் பணியையும், சுத்தம் செய்யும் பணியையும் தனியாரிடம் ஒப்படைத்துவிட்டு, ஒரு குறிப்பிட்ட நீள அளவுக்கு தக்கவாறு பணம் வழங்கி பயனுள்ளவகையில் பராமரிப்பு பணியை செயல்படுத்தலாம்.

பொதுக் கழிப்பிட வசதிகள் :–

இப்பணியை 100 சதவீதம் தனியாரிடமே விட்டுவிடலாம். பயனாளிகளோ அல்லது ஒப்பந்தக்காரர்களோ கட்டணக் கழிப்பிட முறையில் இதை அமுல்படுத்தலாம். உள்ளாட்சி அமைப்புகளால் பராமரிக்கப்படும் கழிப்பிட வசதித் திட்டங்களில் உள்ளார்ந்த நடைமுறைச் சிக்கல்கள் காரணமாக அனைத்து உள்ளாட்சி அமைப்புகளும் இத்திட்டங்களில் இருந்து தங்களை விலக்கிக் கொள்வது அவசரத் தேவையாகும்.

சாலைகள் மற்றும் பாலங்கள் :

உள்ளாட்சி அமைப்புகளின் உயிர்நாடி போன்ற பெருஞ்சாலைகளை ஒப்பந்த முறையில் தனியார் மூலம் பராமரிக்கலாம். சாலைகளில் ஏற்படும் குழிகளை நிரப்புதல், சாலைகள் வெட்டப்பட்டால் உடனடியாக சீரமைத்தல், நடைபாதைகளை பராமரித்தல், ஆக்கிரமிப்புகளை அகற்றுதல் ஆகிய பணிகளையும் தனியாரிடமே ஒப்படைத்து விடலாம்.

மூலதனம் :

நிதி மற்றும் தொழில்நுட்ப அம்சங்களைப் பொறுத்தவரை சாத்தியம் என்ற நிலையில் கட்டி, இயக்கி, மாற்றம் (Build Operate and Transfer) என்ற அடிப்டையில் பாலங்கள் கட்டுதல் போன்ற நகராட்சிப் பணிகளில் தனியார் முதலீடு செய்ய வாய்ப்பு உள்ளது. உள்ளாட்சி அமைப்புகள் வணிக வளாகங்கள், சந்தைகள் கட்டி வாடகையை உயர்த்த இயலாத நிலையில் தொடர்ந்து நட்டமடைந்துள்ளன. அதே நேரத்தில் நகராட்சிக்குச் சொந்தமான நிலங்கள் மிகவும் விலைமதிப்புமிக்க சொத்துக்கள். அவற்றை வருவாய் தரக்கூடிய பயனுக்குட்படுத்தல் அவசியம். நகராட்சி நிலங்களில் கிடைக்கும் வருவாயை பகிர்ந்து கொள்ளக்கூடிய வகையிலும் முதலீட்டாளருக்கு சலுகைக்காலம் அளிக்கும் வகையிலும் தனியார் முதலீட்டினை வரவேற்கக் கருதிப்பார்க்கலாம். இது இழப்பு ஏற்படும் அபாயங்களை குறைப்பதுடன் விலைமதிப்பு மிக்க நகர்ப்புற நிலங்களை அதிக பயன்தரும் விதத்தில் உபயோகப்படுத்த வழிவகுக்கும்.

மேற்கொண்டு எடுக்கப்படவேண்டிய நடவடிக்கைகள் :–

மேலே குறிப்பிட்ட பணிகளை ஒவ்வொரு நகர்ப்புற உள்ளாட்சி அமைப்பும் கருதிப் பார்த்து படிப்படியாக தனியாரிடம் விடக்கூடிய பணிகள் குறித்து முடிவெடுக்கலாம். இருப்பினும் நகராட்சிப் பணிகளை தனியாரிடம் விடுவதற்கு முன் பின்வருவனவற்றை கருத்தில் கொள்ள வேண்டும் :–

அ) ஏலத்தால் முடிவாகக்கூடிய விலையில் (Competitive price) திறம்பட பயன்தரும் வகையில் நகராட்சி சேவைகள் கிடைக்க வேண்டும்.
ஆ) உள்ளாட்சி அமைப்புகளில் ஆட்குறைப்பு ஏற்படும் விதத்தில் அமையக்கூடாது.
இ) ஒப்பந்தம் குறித்த முடிவுக்கு அடிப்படையான அளவுகோல் அனைத்துத் தரப்பினருக்கும் விளங்கக்கூடிய விதத்தில் தெளிவானதாக இருக்க வேண்டும் என்பதால், பின்பற்றப்படும் ஒப்பந்த வழிமுறைகள் வெளிப்படையானதாக இருக்க வேண்டும்.
ஈ) ஒப்பந்த வழிமுறைகள் வெளிப்படையானதாகவும், ஆரோக்கியமான போட்டியை உருவாக்கும் விதமாகவும் இருக்கும்பொருட்டு மேற்கண்ட ஒவ்வொரு பணிக்கும் பொதுப்படுத்தப்பட்ட ஏல ஆவணங்கள் மற்றும் ஏலம் தெரிவு செய்யும் வழிமுறைகளை தயாரிக்குமாறு தமிழ்நாடு நகர்ப்புற உள்கட்டமைப்பு நிதியுதவி நிறுவனம் (Tamil Nadu Urban Infrastructure Financial Services Ltd) கேட்டுக் கொள்ளப்படும். நகர்ப்புற உள்ளாட்சி அமைப்புகள் இந்த ஆவணங்களை தேவைப்படின் உள்ளூர் நிலைமைகளுக்குத் தக்கவாறு மாற்றங்கள் செய்து பயன்படுத்தலாம்.

எஸ். மாலதி
அரசு செயலாளர்

// ஆணைப்படி அனுப்பப்படுகிறது //

பிரிவு அலுவலர்

ABSTRACT

Labour – Contract Labour (Regulation and Abolition) Act, 1970 and the Tamil Nadu Contract Labour (Regulation and Abolition) Rules 1975- Government Order for Abolition of Contract Labour System in the processes of sweeping and scavenging in the establishments / factories employing 50 or more workmen – Ordered – Exemption to Corporation of Chennai from the Government Order and exemption from all the provisions of the Act and Rules- Notifications – Issued.

LABOUR AND EMPLOYMENT DEPARTMENT

G. O. Ms. No. 99 Dated : 8-7-1999

Read:

1. G.O. Ms. No. 2082, Labour and Employment Department, Dated 19.9.1988
2. Letter from the Commissioner, Corporation of Chennai Letter No. LOC. No. L.C2/2748/99, dated 26.4.'99.
3. From the Commissioner of Labour Letter No. L1/43961/99 dated 29.6.99 and 12.7.99.

ORDER:

In the G.O first read above, the Government of Tamil Nadu had prohibited the employment of Contract Labour system in the processes of sweeping and scavenging in the establishments/factories which are employing 50 or more workmen.

2. The Commissioner, Corporation of Chennai in his letter second read above has stated that the Government of Tamil Nadu have issued guidelines in G.O Ms. No.69, Municipal Administration and Water Supply Department dated 4.5.98 to privatise work relating to cleaning and scavenging in local bodies. The above Government order has been issued in public interest with a view to ensure that the members of the public live in better environmental and sanitary conditions. The Commissioner, Corporation of Chennai has also stated that the orders issued in G.O. Ms. No.69, Municipal Administration and Water Supply Department, dated 4.5.98 could not be implemented, due to orders issued in G.O Ms. No.2082, Labour and Employment Department, dated 19.9.88 prohibiting the employment of contract labour system in sweeping and scavenging. The Commissioner, Corporation of Chennai has also stated that the result of non-implementation of privatisation in regard to certain work envisaged in G.O.Ms.No.2082, Labour and Employment Department, dated 19.9.88 would affect the residents of Municipal Corporations, Municipality, Panchayat etc,
3. In view of the above circumstances, the Commissioner, Corporation of Chennai requested the Government to exempt the Corporations, Municipalities, Local Bodies, etc. from the operation of G.O. Ms. No.2082, Labour and Employment Department, dated 19.9.88 for a period of 5 years.
4. The Government, after careful consideration of the request of the Commissioner, Corporation of Chennai and in consultation with the Commissioner of Labour, have decided to amend the notification issued with G.O. Ms.No.2082, Labour and Employment Department dated 19.9.88 in so for as the Corporation of Chennai only, in order to enable the Corporation of Chennai to employ contract labour in the processes of sweeping and scavenging and to issue the following Notifications.
5. The following notifications will be published in the Tamil Nadu Government Gazette;-

NOTIFICATION I

In exercise of the powers conferred by sub-section (1) of section 10 of the Contract Labour (Regulation and Abolition) Act, 1970 (Central Act XXXVII of 1970), the Governor of Tamil Nadu, after having regard to clauses (a) to (d) of sub -section (2) of the said section, hereby takes the following amendment to the Labour and Employment Department's Notification No.II (2) /LE/1352/88, dated the 9th September, 1988 published on page 710 of Part II Section 2 of the Tamil Nadu Government Gazette, dated the 8th September, 1988.

AMENDMENT

In the said Notification, after the expression, employing 50 or more workmen expression "except Chennai Corporation" shall be added.

NOTIFICATION – II

In exercise of the powers conferred by section 31 of the Contract Labour (Regulation and Abolition) Act, 1970 (Central Act XXXVII of 1970), The Governor of TamilNadu here by directs that all the provisions of the said Act and Rules made therender shall not apply to Chennai Corporation in so for as employment of contract labour in the processes of sweeping and scavenging is concerned in view of the urgency prevailing in Chennai Corporation in said processes.

(BY ORDER OF THE GOVERNOR)

G.A. RAJKUMAR
SECRETARY TO GOVERNMENT

To
The Works Manager,
Government Central Press,
Chennai-79 (for Publication in Tamil Nadu Government Gazette)
The Tamil Development Culture and Religious Endowments Department, Chennai – 9
The Commissioner of Labour, Chennai – 6.
The Chief Inspector of Factories, Chennai-5
The Commissioner, Corporation of Chennai-5
Copy to:
All Departments of Secretariat, Chennai-9.

// Forwarded by Order//

SECTION OFFICER

Tips for Implementation of MSWM

- Implementation of the MSW Rules should start with bulk waste generators. This perhaps is the most critical and cost effective way for waste management in a city. Usually bulk generators accounts for 30-40 per cent of city's total waste. These generators are less in number and can be more easily covered. It is possible to achieve early successes by concentrating on these bulk waste producers, initially.
- The waste processing is also easier if such bulk waste is not allowed to get mixed with rest of the city waste. Such waste is more homogeneous / concentrated (containing mostly wet garbage) and thus can easily be recycled / composted or used as a land fill (debris) without additional cost incurred on segregation.
- This can save precious space in land fill site. It is incorrect to dump debris in land fill sites. Similarly, waste from markets and eateries can be composted into organic manure instead of ending in land fill.The rejects from the processing would be disposed into the sanitary landfill.
- Independent collection and transportation of waste from bulk producers helps in establishing a system of collection and transporting segregated waste. As separate vehicles are provided to collect waste from bulk producers, this system can gradually be extended to cover segregated waste collection from other sources.
- Another spin off is less nuisance around community bins. Hotel waste contains leftover food items and it is an usual sight to find dogs and cattle around such bins. Direct collection of waste from the bulk producers prevents such waste from coming on to the streets, and thus from nuisance due to cattle, etc.
- Service charges can be more easily be recovered from such producers. The Municipal legislation allows levy of special sanitation fees on hotels, restaurants, cattle sheds, etc. These generators can also afford to pay the service charges.

The following type of waste could be collected and managed separately.

- ► Waste generated from construction materials/ debris
- ► Waste generated at restaurants, canteens, marriage/party halls, temples
- ► Waste from vegetable & fruit markets, slaughter houses, meat and fish market
- ► Waste generated in parks and gardens, household garden waste, etc
- ► Waste generated during exhibitions, fairs, religious assemblies, conferences etc
- ► Specific waste generated in a proportionally large quantity in a city.

A direct service charge on the generators of bulk cost need to be recovered for the services provided.

ACTION POINTS:

1: *Provide Separate Collection and Disposal Mechanism for Construction Waste / Debris*
2: *Provide Separate Collection Mechanism for Bulk Waste Producers*
3: *Provide for independent handling of Garden / Green Waste*
4: *Specify how residents can handover waste to municipal body*
5: *Prohibit littering on roads, streets*
6: *Municipal bodies must undertake direct door to door collection from all generators*
   Start with a small area first
   Separate Collection Mechanism Required for Different Residences.
   Give the Community rights to monitor services.
7: *Municipal bodies must insist on segregated waste being given during door to door collection*
   Let dry waste be the property of the operator
   Have proper Infrastructure to handle segregated waste
   Plan a separate system for collection of dry waste.
8: *Encourage waste reduction*
   Set up purchase centers for dry waste
9: *Transport waste directly to the processing Site*
10: *Levy user charges for the SWM services with proper bye laws*

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