Para-wise reply as per 24th EAC meeting (Infra-2) held on 30-31 October 2017

"Integrated Municipal Solid Waste Processing Facility in Rewari Cluster at Near Ramsinghpura Village, Rewari, Haryana by M/s Rewari Municipal Council".

1. **Fresh Form-1 along with project specific details.**

Reply- Fresh form is attached along with project specific details.

2. **Adequacy of the facility to cater to wastes generated from the HUDA areas also once they are transferred to the Municipal Corporation.**

Reply- Proposed project is only responsible for management of the waste generated in its municipal area. Waste management HUDA sectors is undertaken by private contractors, RWAs as well as by permanent employees of HUDA. The plant is designed keeping in mind the future waste generations and shall be able to cater the larger quantities of waste if received.

3. **Complete site details as per the notification of 2016 and conformity to siting criteria as mentioned therein.**

Reply- Complete site details is furnished in PFR as per the notification of 2016. The location analysis criteria is attached as an annexure-….

	Criteria	CPHEEO Manual Requirement
1	Lake/Pond	200 m away from the Lake/Pond
2	River/Streams	100 m away from the river/stream
3	Flood Plain	No land fill shall be constructed within a 100 year flood plain
4	Highway	Away from 200 m NHAI/State
5	Public Parks	300 m away from public parks
6	Wet Lands	No landfill within wet lands.
7	Habitation	500 m away from the notified habitation Area
8	Groundwater Table	Groundwater table > 2m.
9	Critical Habitat Area	No landfill within the Critical habitat area.
10	Airports	No landfill within 20 Km
11	Water Supply Schemes/Wells	Minimum 500 m Away
12	CRZ	Should not be sited

4. **Is it a new proposal or an expansion is the site being currently used? Why is this not a violation case.**

Reply- The site is currently used as dumpsite. The processing and sanitary landfilling is proposed to be done in this side for the Rewari cluster.

5. **The specific proposals for waste handling and disposal.**

Reply- The specific proposal for waste handling and disposal is being defined in PFR. The proposed plant will comply all the prescribed norms.

6. **Details of infrastructure and other plant and machinery to match with the proposals.**

Reply- Construction of Intermediate storage, Wheel wash facility, Office building, Approach and Internal road, Compound wall, Secured landfill cell in phases, Leachate well, Ground water monitoring well, RDF, Bio-methanation plant, composting facility etc.

7. **Need for power from the electricity board when a captive power plant is proposed.**

Reply- Captive power plant is not envisaged, the power will be sourced from 1 DG set of 250 KVA during construction phase. Afterwards required power 250 KW will be supply from

state electricity board cater to the needs of the MSW processing facility, also 1 D.G. set of 250 KVA capacity will be kept on standby.

8. Need for composting when wastes to energy options are proposed.

Reply- Waste to energy plant is not envisaged in proposed project and it has been updated in Form-1 & PFR. The MSW processing unit would comprise of the following:

1. Bio-Methanation Plant
2. RDF Processing Facility
3. Composting Facility
4. Sanitary Landfill

9. Details of waste water treatment.

Reply- The total water requirement during operation phase will be 80.06 KLD, waste water generation will be 48.5 KLD which will treated in Effluent Treatment Plant (60 KLD).

10. Consolidated inventory of sources of Air and water pollution.

Reply- Sources of Air Pollution-: Construction Activities, Vehicles Movement, Loading & Unloading of Trucks, D.G Set, Processing of Waste

Sources of Water Pollution-: Domestic Waste, Leachate from Windrow Compost Plant & Leachate from landfill.

11. Clear details on handling and disposal of Hazardous wastes.

Reply- Generated spent oil from D.G sets (Category 5.1) will be collected and handed over to authorized recyclers. Approximately 300 liter/year used oil will be generated.

APPENDIX I

FORM – I

(I) Basic Information:-

<table>
<tr><th>Sr. No</th><th>Item</th><th>Details</th></tr>
<tr><td>1.</td><td>Name of the project/s</td><td>Proposed Integrated Municipal Solid waste processing facility for Rewari Cluster {Ateli Mandi, Bawal, Dharuhera, Kanina, Mahendragarh, Nangal Choudhary, Narnaul and Rewari}</td></tr>
<tr><td>2.</td><td>S. No. in the schedule</td><td>7 (i) Common Municipal Solid Waste Management Facility (CMSWMF)</td></tr>
<tr><td>3.</td><td>Proposed capacity/area/length/tonnage to be handled/ command area/lease area/ number of wells to be drilled</td><td>Total Area- 14.625 acres
Plant Capacity- approx 300 TPD</td></tr>
<tr><td>4.</td><td>New / Expansion / Modernization</td><td>Existing Dumpsite</td></tr>
<tr><td>5.</td><td>Existing Capacity/ Area etc.</td><td>Not Applicable</td></tr>
<tr><td>6.</td><td>Category of Project i.e. ‘A’ or ‘B’</td><td>Category ‘A’</td></tr>
<tr><td>7.</td><td>Does it attract the general condition? If Yes, please specify.</td><td>Yes, Interstate boundary of Haryana and Rajasthan lies at a distance of 6.44 Km from project site.</td></tr>
<tr><td>8.</td><td>Does it attract the specific condition? If Yes, please specify</td><td>No</td></tr>
<tr><td>9.</td><td>Location</td><td>
<table>
<tr><th>Coordinate Points</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>A.</td><td>28^{0}03’42.93"N</td><td>76^{0}32’31.29"E</td></tr>
<tr><td>B.</td><td>28^{0}03’42.48"N</td><td>76^{0}32’26.23"E</td></tr>
<tr><td>C.</td><td>28^{0}03’46.44"N</td><td>76^{0}32’25.75"E</td></tr>
<tr><td>D.</td><td>28^{0}03’47.14"N</td><td>76^{0}32’27.85"E</td></tr>
<tr><td>E.</td><td>28^{0}03’48.81"N</td><td>76^{0}32’27.86"E</td></tr>
<tr><td>F.</td><td>28^{0}03’47.51"N</td><td>76^{0}32’33.06"E</td></tr>
<tr><td>G.</td><td>28^{0}03’45.42"N</td><td>76^{0}32’35.71"E</td></tr>
</table>
</td></tr>
<tr><td></td><td>Plot/Survey/Khasra No.</td><td></td></tr>
<tr><td></td><td>Village</td><td>Near Ramsinghpura</td></tr>
<tr><td></td><td>Tehsil</td><td>Rewari</td></tr>
<tr><td></td><td>District</td><td>Rewari</td></tr>
<tr><td></td><td>State</td><td>Haryana</td></tr>
<tr><td>10.</td><td>Nearest railway station/airport along with distance in kms.</td><td>Bawal railway station 3.19 Km
New Delhi Airport 76 Km</td></tr>
<tr><td>11.</td><td>Nearest town, city, district headquarters along with distance in kms.</td><td>Nearest Town/City Rewari 5.7 Km</td></tr>
</table>

12.	Village Panchayat, Zila Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	Rewari Municipal Council
13.	Name of the applicant	Rewari Municipal Council
14.	Registered address	Near Bharawas Gate, Rewari.
15.	Address for correspondence:	
	Name	Shri. Ajay Sikka
	Designation (Owner/Partner/CEO)	Municipal Engineer
	Address	Rewari Municipal Council
	Pin Code	123401
	E-mail	secymc.rewari@gmail.com
	Telephone No.	01274-225263
	Fax No.	
16.	Details of Alternatives Sites examined, if any. Location of these sites should be shown on a Topo sheet	Details of Alternate site are given in PFR (pre-Feasibility report).
17.	Interlinked Project	No
18.	Whether separate application of interlinked project has been submitted?	NA
19.	If Yes, date of Submission	NA
20.	If no, reason	NA
21.	Whether the proposal involves approval/clearances under: if yes, details of the same and their status to be given. The Forest (Conservation) Act, 1980? The Wildlife (Protection) Act, 1972? The C.R.Z Notification, 1991?	No
22.	Whether there is any Government Order /Policy relevant/ relating to the site?	No
23.	Forest land involved (hectares)	No
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? Name of the court Case No. Orders/directions of the Court, if any and its relevance with the proposed project.	None

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

Sr. No	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	Total land = 14.625 acres In the proposed site, MSW has been dumped for more than a years. The proposed project will clear the unorganized dump and the waste from the dump will be disposed of in a sanitary landfill etc.
2.	Clearance of existing land, vegetation and buildings?	**No**	**NA**
3.	Creation of new land uses?	**Yes**	**NA**
4.	Pre-construction investigations e.g. bore houses, soil testing?	**Yes**	Pre- construction investigations of bore wells and soil characteristics are in progress.
5.	Construction works?	**Yes**	The Proposed involves capping/construction of new secured landfill/composting facility etc.
6.	Demolition works?	**No**	NA
7.	Temporary sites used for construction works or housing of construction workers?	**Yes**	Local laborers to be employed from nearby villages. If required make labor camp with basic amenities shall be set up within the site only.
8.	Above ground buildings, structures or Earthworks including linear structures, cut and fill or excavations	**Yes**	All buildings (i.e. Shed, Lab, Office etc.) are above ground except landfill cells, foundations and underground storage tank.
9.	Underground works including mining or tunneling?	**Yes**	NA
10.	Reclamation works?	**No**	NA
11.	Dredging?	**No**	NA

12.	Offshore structures?	**No**	NA
13.	Production and manufacturing Processes?	**Yes**	NA
14.	Facilities for storage of goods or materials?	Yes	Materials which are used for construction shall be stored in temporary sheds at site.
15.	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	Detail disposal of solid waste is discussed in Pre-feasibility report
16.	Facilities for long term housing of Operational workers?	**No**	Priority to be given to local villagers
17.	New road, rail or sea traffic during Construction or operation?	**Yes**	Only Road traffic will increase. Traffic due to transportation of construction material during construction phase, during nonpeak, day hours of approximately 5 trucks. During operation phase: Approximately 20 trucks. Increase in Vehicular traffic due to commute of employees and workers during construction and operation phase.
18.	New road, rail, air waterborne or Other transport infrastructure including new or altered routes and stations, ports, airports etc.?	**No**	Existing infrastructure is sufficient to cater the extra traffic load due to the proposed project.
19.	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	**No**	NA
20.	New or diverted transmission lines or pipelines?	**No**	NA
21.	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	NA
22.	Stream crossings?	No	NA

23.	Abstraction or transfers of water form ground or surface waters?	**No**	Water shall be provided from Municipal Council Rewari.
24.	Changes in water bodies or the land surface affecting drainage or run-off?	**No**	NA
25.	Transport of personnel or materials For construction, operation or decommissioning?	**Yes**	Laborers and raw material will be transported via the existing Infrastructure
26.	Long-term dismantling or decommissioning or restoration works?	**No**	Not Applicable. Closure of landfill cell at end as per CPCB guidelines. Green belt/garden will be developed.
27.	Ongoing activity during decommissioning which could have an impact on the environment?	**No**	NA
28.	Influx of people to an area in either temporarily or permanently?	**No**	Priority will be given to local area people
29.	Introduction of alien species?	**No**	NA
30.	Loss of native species or genetic Diversity?	**No**	NA
31.	Any other actions?	**No**	NA

2. **Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

Sr. No	**Information/Checklist Confirmation**	**Yes/No**	**Details thereof (with approximate quantities /rates, wherever possible) with source of information data**
2.1.	Land especially undeveloped or agricultural land (ha)	No	Currently Waste is being openly dumped at this land
2.2.	Water (expected source & competing users) unit: KLD	**Yes**	Construction Phase: 6 - 8 KLD Source: Municipal Council of Rewari Operation Phase: 80.06 KLD Source: Ground water / Treated sewage from Municipal Council of Rewari

2.3.	Minerals (MT)	**No**	NA
2.4.	Construction material – stone, aggregates, sand / soil (expected source – MT)		Cement, Steel, Rocks and aggregates, Sand, Geo Membrane Stone, Aggregate, Steel, Cement Source: Local Supplier
2.5.	Forests and timber (source – MT)	**No**	NA
2.6.	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)		1 D.G set of 250 KVA will be utilized for power during construction phase. During operation phase 250KW power will be taken from of State Electricity Board and for emergency 1 D.G set of 250 KVA will be utilized as backup.
2.7.	Any other natural resources (use appropriate standard units)	**No**	NA

3. Use , Storage , transport , handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health

Sr. No	**Information/Checklist Confirmation**	**Yes/No**	**Details thereof (with approximate quantities /rates, wherever possible) with source of information data**
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	NA
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	**No**	Positive change expected. With capping of existing dumpsite and with construction of new secured landfill, occurrence of disease expected to decrease.
3.3	Affect the welfare of people e.g. By changing living conditions?	**No**	Improved living condition by direct & indirect employment.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	**No**	-
3.5	Any other causes	**No**	-

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

Sr. No	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	**No**	All the excavated material generated out of foundation excavation will be used for construction of embankment of the cell.
4.2	Municipal waste domestic and or commercial wastes)	**Yes**	The Municipal solid waste handled during operation phase is expected to be 197 TPD in 2017, 236 TPD in 2025 and 335 TPD in 2035.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	**Yes**	--
4.4	Other industrial process wastes	**No**	--
4.5	Surplus product	**No**	--
4.6	Sewage sludge or other sludge from Effluent treatment	**Yes**	Sludge, if any generated, from leachate treatment plant- to be landfilled..
4.7	Construction or demolition wastes	**Yes**	--
4.8	Redundant machinery or equipment	**No**	NA
4.9	Contaminated soils or other materials	**No**	NA
4.10	Agricultural wastes	**No**	NA
4.11	Other solid wastes	**No**	NA

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

Sr. No	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Not envisaged except for movement of vehicles for transporting waste to site.
5.2	Emissions from production processes	**Yes**	Air emissions will be generated from production process based on RDF. The same will be treated as per the SPCB/CPCB norms using flue gas cleaning system before its release in environment.
5.3	Emissions from materials handling Including storage or	**No**	NA

	transport		
5.4	Emissions from construction activities including plant and equipment	**Yes**	Fugitive emissions during unloading of construction material, concrete mixers etc.
5	Dust or odors from handling of materials including construction materials, sewage and waste	**Yes**	Dust and Odour will be generated during transportation and handling of Municipal solid waste. Same will be kept under control by water spraying, odour control measures and other methods.
5.6	Emissions from incineration of waste	**No**	**-**
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	**No**	NA
5.8	Emissions from any other sources	**Yes**	D. G Emission

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

Sr. No	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Increase in noise level due to the movement of vehicles and construction machinery.
6.2	From industrial or similar processes	**Yes**	Noise will be generated during MSW processing but same will be kept as per noise limitation of SPCB.
6.3	From construction or demolition	**Yes**	Minor increase in noise due to transportation of construction material
6.4	From blasting or piling	**No**	NA
6.5	From construction or operational traffic	**Yes**	Minor increase due to transportation activity
6.6	From lighting or cooling systems	**No**	---
6.7	From any other sources	**No**	---

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

Sr. No	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage	**No**	NA

	of hazardous materials		
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	**No**	Leachate will be treated as per PCB/CPCB norms. There will not be any land disposal of leachate.
7.3	By deposition of pollutants emitted to air into the land or into water	**No**	NA
7.4	From any other sources	**No**	NA
7.5	Is there a risk of long term buildup of pollutants in the environment from these sources?	**No**	--

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

Sr. No	**Information/Checklist Confirmation**	**Yes/No**	**Details thereof (with approximate quantities /rates, wherever possible) with source of information data**
8.1	From explosions, spillages, fires etc. from storage, handling, use or production of hazardous substances	**Yes**	NA
8.2	From any other causes	**Yes**	NA
8.3	Could the project be affected by Natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc.)?	**No**	The project fall under seismic zone IV

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

Sr. No	Information/Checklist Confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
9.1	Lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: •Supporting infrastructure roads, power supply, waste or waste water treatment, etc.) •housing development •extractive industries • supply industries • other	**No**	Due to the proposed project, local ancillary units will be developed. Local infrastructure as well as low-scale commercial facilities will be developed.
9.2	Lead to after-use of the site, which could have an impact on the environment	**Yes**	The landfill will be scientifically capped after the project completion.
9.3	Set a precedent for later developments	**Yes**	NA
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	**No**	NA

(III) Environmental Sensitivity

Sr. No	Area	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	**NIL**	NA
2	Areas which are important or sensitive for Ecological reasons Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	**NIL**	NA
3	Areas used by protected, important or Sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	**NIL**	NA
4	Inland, coastal, marine or underground waters.	**NIL**	NA
5	State, National boundaries.	**Yes**	Inter State boundary of Haryana and Rajasthan lies at a distance of 2.23 km from project site.

6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas.	**No**	NA
7	Defense installations	**None**	NA
8	Densely populated or built-up area	**Yes**	Rewari lies at a distance of 5.7 km from project site.
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	**Yes**	Rewari lies at a distance of 5.7 km from Integrated MSW Processing facility.
10	Areas containing important, high quality or scarce resources. *(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)*	**No**	NA
11	Areas already subjected to pollution or Environmental damage. *(those where existing legal environmental standards are exceeded)*	**None**	NA
12	Areas susceptible to natural hazard which Could cause the project to present environmental problems. (*earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions*)	**Nil**	NA

(IV) Proposed Terms of Reference for EIA studies

"I hereby given undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost.

Date: 19.09.2017

Place:

Rewari Municipal Council,
Rewari, Haryana.

Pre- Feasibility Report

Integrated Solid Waste Management, Haryana

For

Rewari Cluster

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 EXECUTIVE SUMMARY

Rewari Cluster generates all kinds of waste, which poses a serious health and sanitation hazard for its residents. Apart from MSW, Rewari, cluster generates a lot of e-waste (due to a huge corporate sector) as well as bio-medical waste (due to a growing hospital sector). Besides, industrial waste (including sludge etc.) is also generated in large quantities due to a growing industrial base. The cluster has an urban area of about 1594 square km. and a resident population of about 437363 as of 2017. It generates 197 metric tons of Municipal solid waste as per MCR officials every single day. The projected population in 2025 will be 554039 generating 249 metric tons municipal waste and in 2035 population will be 744582 generating 335 metric tons of municipal waste.

The Municipal Council of Rewari (MCR) is the apex body responsible for waste planning and management in the city. As far as its operational role is concerned, MCR is only responsible for management of the waste generated in its municipal area. Waste management in HUDA sectors is undertaken by private contractors, RWAs as well as by permanent employees of HUDA.

The proposed integrated municipal solid waste processing facility will cater to the needs of Rewari Cluster which comprises ULBs of Ateli Mandi, Bawal, Dharuhera, Kanina, Mahendragarh, Nangal Chaudhary, Narnaul and Rewari. Estimated MSW generation in Rewari cluster is about 197 TPD in 2017. It is expected to reach 335 TPD by 2035. Municipal Council Rewari is the designated ULB for Rewari cluster.

Table 1-1: Details of the proposed project

S. No.	Information	Details
1.	Project name	Integrated Municipal Solid Waste Processing facility, Rewari, Haryana
2.	Area	Total Area- 14.625 acres
	Location of Site	
3.	Villages	Near Ramsinghpura village
4.	District	Rewari
5.	State	Haryana
6.	Water Requirement and its source	80.06 KLD
7.	Power Supply and its source	Construction Phase : D.G set 1x 250 KVA Operation Phase : 250 KW, State electricity board
8.	Project Cost	72.65 crore
9.	Nearest Railway station	Bawal Railway Station, 3.19 Km
10.	Nearest SH/NH	NH-8

11.	Nearest Air port	New Delhi 76 Km

2 INTRODUCTION AND BACKGROUND

2.1 Identification of Project and Project Proponent

The state of Haryana generates about 4514 tonnes per day (TPD) of Municipal Solid Waste and this quantity is likely to increase till 7,675 TPD by 2035, assuming the rate of increase of per capita waste generation is in proportion to increase in urban population. Directorate of Urban Local Bodies (DULB), in its endeavor to provide people with safe, clean and healthy environment, has proposed to set up cluster based integrated solid waste management facilities in the ULBs of Haryana in Public Private Partnership mode.

Based on factors such as existing treatment plants, free land pockets, and optimal waste transport distance, 15 cluster based MSW treatment plants have been proposed in Haryana. Rewari cluster comprises of the ULBs of Ateli Mandi, Bawal, Dharuhera, Kanina, Mahendragarh, Nangal Choudhary, Narnaul and Rewari. Estimated MSW generation in Rewari Cluster is about 197 TPD. It is expected to reach 335 TPD by 2035.

The proposed integrated Municipal solid waste Processing facility with a capacity of approx. 300 TPD will be set up in 14.625 acres of existing site in Ramsinghpura village.

2.2 Need of Project and its Importance to Region

Rewari is an ancient city and known as Brass City. Rewari has a variety of industries, from cottage industries to small-scale integrated units and automobiles and auto ancillary industries. The traditional industries are brass metalwork and ornamental shoes (Tilledar Jooti) Rewari has kept the traditional art of Tilledar Jooti alive and is famous for such ornamental local shoes. World's largest production of motor cycles is in Hero Moto Corp. Dharuhera plant. Due to rapid development and urbanization in the city is generating all kind of waste, which is becoming a serious health and sanitation hazard for its residents. Therefore, management of rapidly rising waste quantities is of utmost importance. The project seeks to improve and develop a socially and environmentally sustainable system of solid waste management which will reduce the associated environmental and public health risks.

The project intends to create a socially, economically and environmentally viable solid waste management system to develop an environmentally and aesthetically sound MSW dumping site. The major objective is to reduce the huge amounts of solid waste generated and its associated health risks in this Cluster.

In this regard, the Municipal Council of Rewari the designated ULB for Rewari cluster intends to obtain environmental clearance from the Ministry of Environment, Forest & Climate Change for Integrated Municipal Solid Waste Processing Facility for Ateli Mandi, Bawal, Dharuhera, Kanina, Mahendragarh, Nangal Choudhary, Narnaul and Rewari ULB's at Rewari village, in Rewari district, Haryana.

2.3 Employment Generation (Direct and Indirect) due to the Project

Presently, the entire waste is being dumped at the existing proposed site. For construction of processing facility there would be requirement of local semi-skilled people and also during operation period there would be requirement of skilled and semi-skilled people. This will lead to generation of employment at the local level. Unskilled workers would also be required for door to door collection of waste. All these activities would generate employment. Thus the project shall have positive impact on the society and will enhance the socio-economic condition of all people who would be associated with this project directly or indirectly. Approx. 200 individuals will benefit directly and approx. 50 individuals will be involved indirectly (supply chain).

3 PROJECT DESCRIPTION

3.1 Type of Project

As per the EIA notification dated 14th September, 2006, as amended till date, the proposed project falls under the Project / Activity: 7 (i)– Common Municipal Solid Waste Management Facility (CMSWMF) under Category "A ".

3.2 Site Location and Connectivity

The proposed integrated Municipal solid waste Processing facility is situated in Near Ramsinghpura Village, Tehsil & District: Rewari in Haryana. The site is easily approachable by NH-8. The nearest railway station is Bawal Railway Station. Indira Gandhi International airport is the nearest airport at an aerial distance of 76 km. The location map is shown in figure 3.1.

The coordinates of the proposed project site are given in below table and the Google map of the project site is shown in figure 3.2.

Table 3-1: Coordinates of the Project Site

Coordinate Points	Latitude	Longitude
A.	28^{0}03′42.93"N	76^{0}32′31.29"E
B.	28^{0}03′42.48"N	76^{0}32′26.23"E
C.	28^{0}03′46.44"N	76^{0}32′25.75"E
D.	28^{0}03′47.14"N	76^{0}32′27.85"E
E.	28^{0}03′48.81"N	76^{0}32′27.86"E
F.	28^{0}03′47.51"N	76^{0}32′33.06"E
G.	28^{0}03′45.42"N	76^{0}32′35.71"E

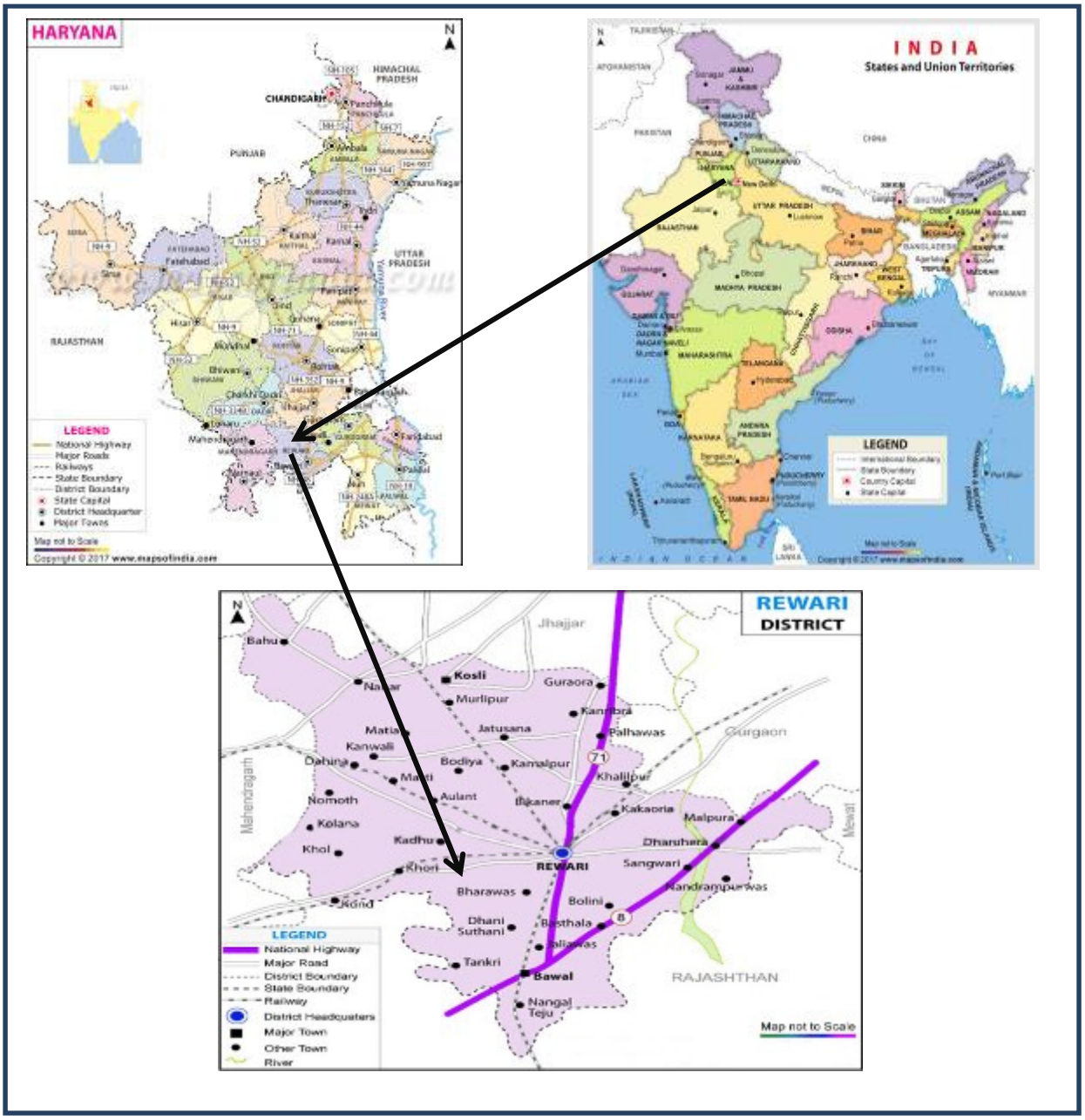

Figure 3-1: Site Location

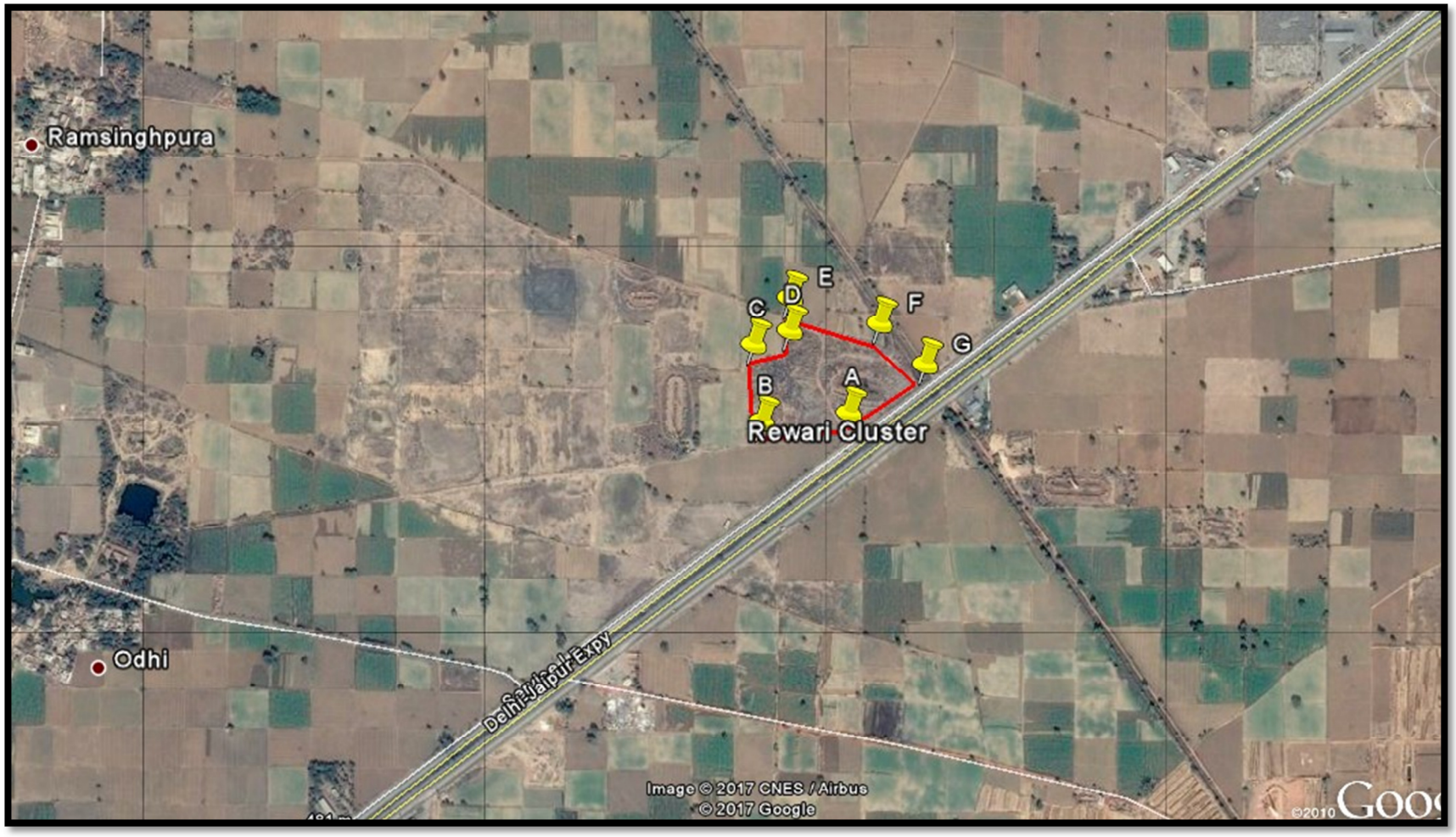

Figure 3-2: Google Image of the Project Site

Figure 3-3: Project Site

3.3 Details of Alternate Site Considered

As this is new project hence alternative sites were examined and the site at Rewari village was finalized based on the easy accessibility, approachability, transportation of waste etc.

This alternate landfill site was about 2.12 km away from the city center and near Jatuwas village.

Few of the perceived impacts of this site are:

The proposed Jatuwas site is nearer to residential area or habitation. There are a few villages within 1 km from the proposed site.

Due to lesser space availability we can't do any expansion in near future.

Comparison of both sites:

Sr. no	Parameters	Site at *Ramsinghpura*	Site near Jatuwas Village
1	Land Availability	√	√ (lesser space)
2	Land levelling cost (Cut and fill)	X	√
3	Ease of transportation of waste	√	√
4	Existing dumping site or defunct waste facility	X	X
5	Distance from river> 100 meter	√	√
6	200 meter from a pond	√	√
7	200 meter from Highways, Habitations, Public Parks and water supply wells	√	√
8	20 km away from Airports or Airbase	√	√
9	Hazard prone areas (earthquakes, winds, cyclone	X	X
10	No zone of coastal regulation	X	X
11	Important bird areas	X	X
12	Sensitive land use (water bodies, reservoirs, creeks, agriculture, forest, settlement, schools, hospital etc.) within 1 km.	X	X

3.4 Size and Magnitude of Operation

The proposed project is for design of integrated Municipal solid waste Processing facility of approx. 300 TPD of MSW in an area of 14.625 Acres for 20 years.

3.5 Project Description with Project Details

- **Cluster Formation**

MSW can be managed through a centralized approach, a decentralized approach or a combination of the two. Waste management services under each approach in turn can be delivered by the ULBs themselves or in association with the private sector or the local community. The Integrated Municipal solid waste processing facility at Rewari village will be developed with a Centralized approach.

- **Basis of Cluster Formation**

The quantity and composition of MSW generated in the ULB is essential for determining collection, processing and disposal options that could be adopted. They are dependent on the population, demographic details, principal activities in the city/ town, income levels and lifestyle of the community. In order to assess the sufficiency of the existing and potential MSW treatment capacity of the State of Haryana, the following step-wise process has been followed;

- Data on current MSW generation from non-industrial (domestic, commercial) and industrial sectors has been collected from ULBs
- Population projections have been made taking population of 2011 as the base figures and considering 3% YoY increase in urban areas (CPHEEO manual, 2015)
- Future MSW generation from domestic, commercial and industrial sectors is estimated using sector specific growth factors
- Treatment capacity of all functioning treatment plants and potential treatment capacity of identified land pockets have been estimated
- The optimal transport distance used to identify the cluster boundary is estimated to be 30 km. In addition, the maximum distance used to define any cluster boundary is 50 km.

- **Constitution of Rewari Cluster**

Rewari cluster consists of seven ULBs, Municipal Committee Rewari, Municipal Council Ateli Mandi, Municipal Committee Bawal, Municipal Council Dharuhera,

Municipal Committee Kanina, Municipal Committee Mahendragarh, Municipal Committee Nangal Choudhary and Municipal Committee Narnaul Mandi ULBs. The cluster boundary is depicted in the following figure:-

- **Details of Participating ULBs**

The details of the ULBs constituting the Rewari cluster are as follows:

1. Ateli Mandi

Ateli is a Municipal Committee city in district of Mahendragarh, Haryana. The Ateli city is divided into 11 wards for which elections are held every 5 years. The Ateli Municipal Committee has population of 7,618 of which 4,040 are males while 3,579 are females as per report released by Census India 2011.

2. Bawal

Bawal is a Municipal Committee city in district of Rewari, Haryana. The Bawal city is divided into 13 wards for which elections are held every 5 years. The Bawal Municipal Committee has population of 16,776 of which 8,828 are males while 7,948 are females as per report released by Census India 2011.

3. Dharuhera

Dharuhera is a Municipal Committee city in district of Rewari, Haryana. The Dharuhera city is divided into 17 wards for which elections are held every 5 years. The Dharuhera Municipal Committee has population of 30,356 of which 16,414 are males while 13,930 are females as per report released by Census India 2011.

4. Kanina

Kanina is a village situated in Mahendragarh tehsil of Mahendragarh district in Haryana. The Kanina is divided into 13 wards. As per the Population Census 2011 the total population of Kanina is 12981.

5. Mahendragarh

Mahendragarh district occupies 19th position in population size during 2011.In terms of density Mahendragarh ranks at 16th position with a density of 486. Whereas during 2001 the density was 428. As per the Population Census 2011 the total population of Mahendragarh is 29128.

6. Nangal Chaudhary

Nangal Choudhary is an important town and tehsil headquarters of District Mahendragarh at Narnaul. It holds the crown of being "First Cyber Village of Haryana". Now it has an assembly seat in Haryana government.

7. Narnaul

Narnaul is a Municipal Council city in district of Mahendragarh, Haryana. The Narnaul city is divided into 23 wards for which elections are held every 5 years. The Narnaul Municipal Council has population of 74,581 of which 39,569 are males while 35,012 are females as per report released by Census India 2011.

8. Rewari

Rewari city is governed by Municipal Council and is situated in Haryana State/UT. As per provisional reports of Census India, population of Rewari in 2011 is 143,021; of which male and female are 75,764 and 67,257 respectively.

3.5.1 Salient Features of the Project

The proposed project is for design of integrated Municipal solid waste Processing facility of approx. 300 TPD of MSW in an area of 14.62 5 Acres for 20 years. Project Details are given in Table 3.2.

Table 3-2: Project Details

Sr. No.	Particulars	Details
1.	Land Area	14.625 Acres
2.	Life Span of Land Fill	20 Years
3.	Power Requirement	250 KW, State Electricity Board
4.	Proposed Capacity of D.G set in KVA	1 D.G. Set of 250 KVA
5.	Water Requirement	80.06 KLD
6.	Total Waste Generation	197 TPD

Environmental Settings of the Area of project are given in Table 3.3

Table 3-3: Environmental Settings of the Area

Sr. No.	Area	Place	Distance (km)
1.	Nearest River	-	-
2.	Nearest Road	NH-8	-
3.	Nearest Railway Station	Bawal Railway Station	3.19 Km
4.	Nearest Airport	Indira Gandhi International Airport	76 Km
5.	Nearest Town	Rewari	16.1 Km
8	Seismic zone	Zone – IV	

3.5.2 Processing Description

The activities planned in the proposed project include collection, transportation, segregation, treatment & disposal of municipal solid waste in compliance to the Solid waste Management Rules 2016.

- **Primary Collection**

Primary collection refers to the process of collecting waste from households, markets, institutions and other commercial establishments and taking the waste to a storage depot/ transfer station. Primary collection may be accomplished through the use of containerized push carts/tri-cycles, small mechanized vehicles, compactors and/or tipping vehicles.

- **Secondary Storage**

Secondary collection includes picking up waste from community bins, waste storage depots or transfer stations and transporting it to waste processing sites or to the final disposal site. It comprises of both activities – secondary storage and secondary transportation

- **Transfer Station**

Transfer stations have been proposed as a common collection point for solid waste from nearby ULBs. The waste carried in smaller vehicles from each ULB is first dumped at a transfer station and then transferred to larger vehicles (e.g. refuse compactors), which transport it to a processing facility. MSW from nearby ULBs is either delivered to a transfer station or directly to a processing facility depending on whichever is nearer. This method of transporting waste in bulk helps in reduction of the overall transportation cost and also substantially reduces the traffic and environmental nuisance associated with a number of small refuse collection vehicles on the road.

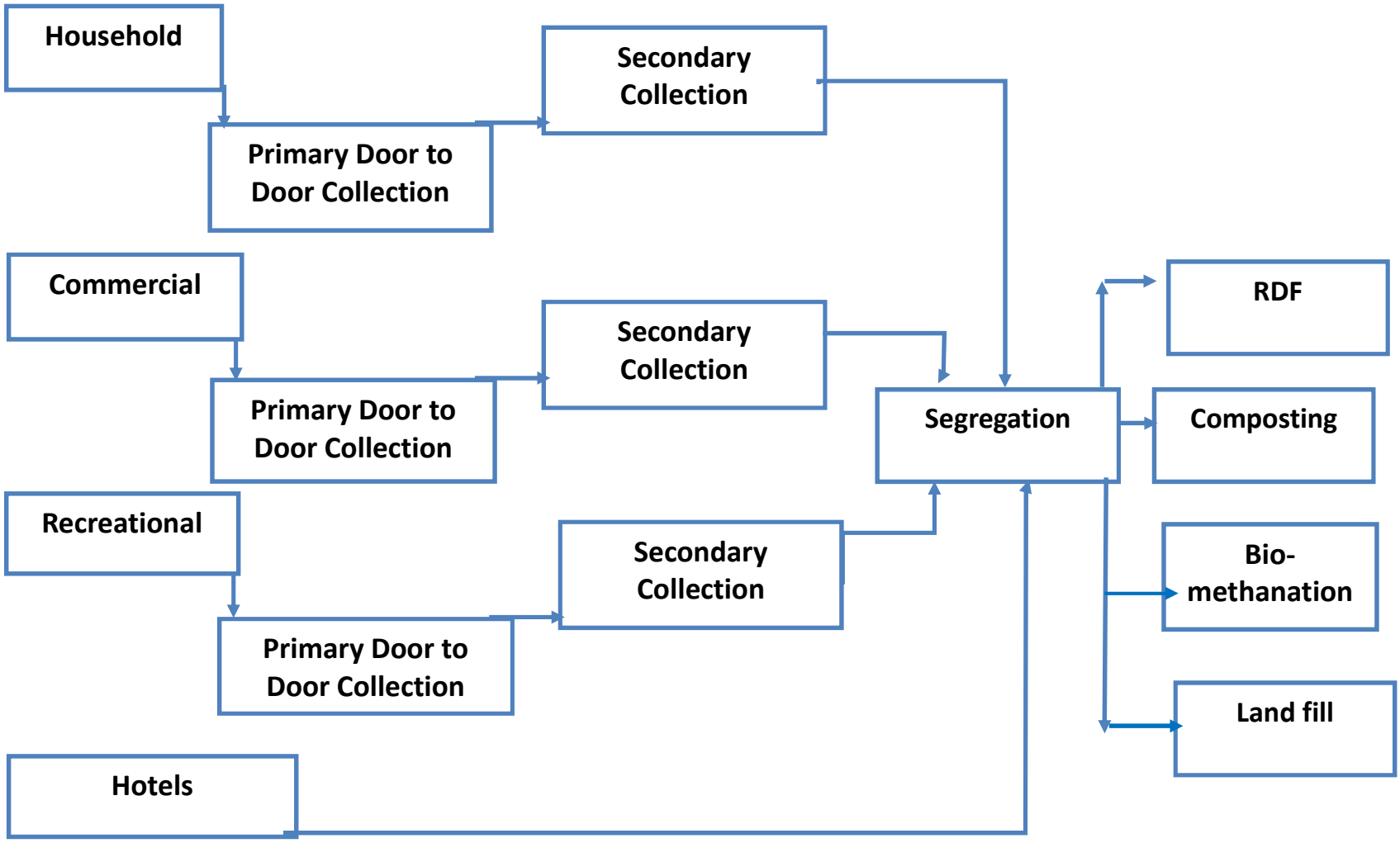

Figure 3-4: Methodology for Proposed Waste Collection

3.5.3 MSW Treatment Technologies

This project concept has been developed taking into considerations the following design criteria, for the design period of 20 years.

1. Compliance with the Solid Waste Management Rules (2016) for waste collection, transportation, treatment & disposal;

2. Providing Door to door collection of waste from source in segregated manner with the introduction of 2-bin system (for green waste and dry waste);

3. Introduction of an efficient secondary waste collection & transportation system.

4. Adapting the 4R's principal of waste management through reduction, reuse, recycle and recover.

Hence, proposed a mechanism for recovery of recyclables at the Processing facility and waste reuse through composting of food waste and other green waste

5. Final disposal of only rejects/inerts at the scientifically developed sanitary landfill with an attempt to dispose not more than 25% of the generated waste quantity at the landfill.

The municipal waste received at the site is processed at waste management facility by segregating the waste into recyclable and composting material. After separation of recyclables, the compostable material will be diverted to compost plant. The plant is designed to process approx. 300 TPD municipal solid wastes (MSW) and is able to process different kind of waste types.

MSW processing unit will comprise of the following plants:

A. Bio-methanation plant
B. RDF Processing Plant
C. Composting Plant
D. Sanitary Landfill

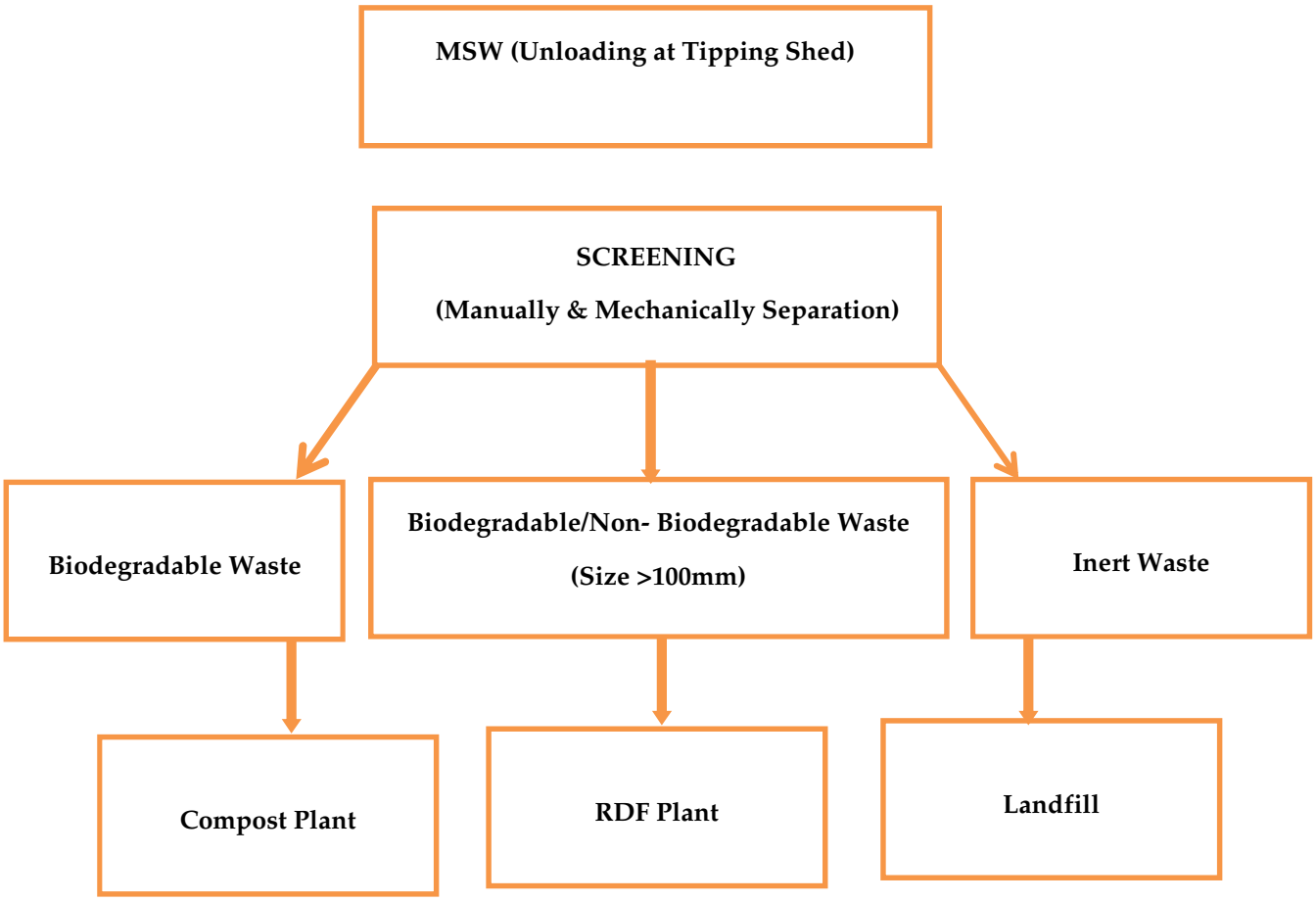

Figure 3-5: Flow chart for MSW Project

A. Bio-methanation Plant

Bio-methanation is a process by which organic material is microbiologically converted under anaerobic conditions to biogas. Three main physiological groups of microorganisms are involved: fermenting bacteria, organic acid oxidizing bacteria, and methanogenic archaea. Microorganisms degrade organic matter via cascades of biochemical conversions to methane and carbon dioxide. Syntrophic relationships between hydrogen producers (acetogens) and hydrogen scavengers (homoacetogens, hydrogenotrophic methanogens, etc.) are critical to the process. Determination of practical and theoretical methane potential is very important for design for optimal process design, configuration, and effective evaluation of economic feasibility. A wide

variety of process applications for bio-methanation of wastewaters, slurries, and solid waste have been developed. They utilize different reactor types (fully mixed, plug-flow, biofilm, UASB, etc.) and process conditions (retention times, loading rates, temperatures, etc.) in order to maximize the energy output from the waste and also to decrease retention time and enhance process stability. Bio-methanation has strong potential for the production of energy from organic residues and wastes. It will help to reduce the use of fossil fuels and thus reduce CO_2 emission.

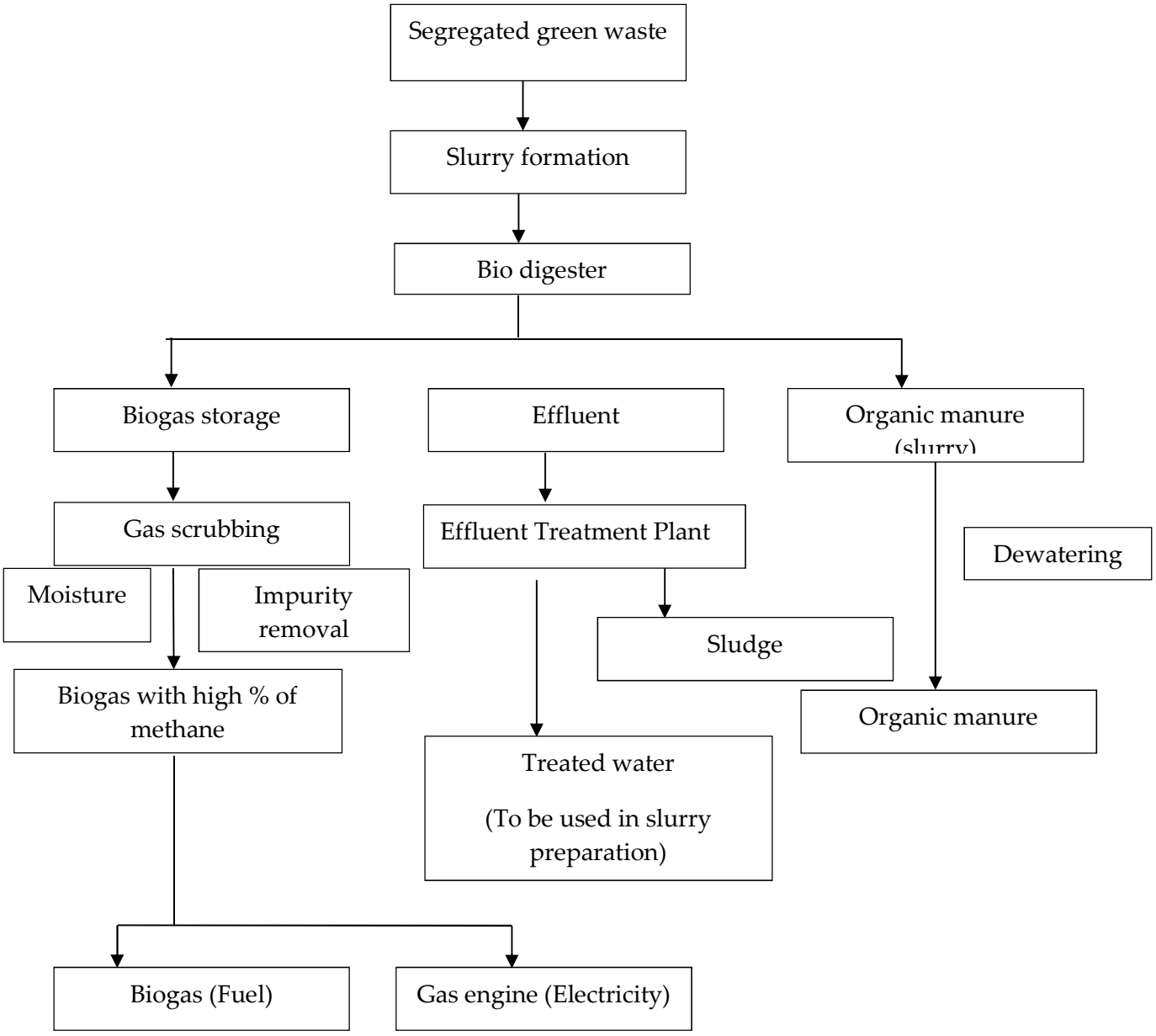

Figure 3-6: **Flowchart for Bio-methanation Plant**

B. RDF Plant

RDF (Refuse Derived Fuel) is a fuel with high calorific value that is normally produced from solid waste. The larger fractions of MSW, which are separated in the first segregation step, consist of larger combustible waste such as paper, plastic, textiles, coconut shells, rubber etc. The large inert fractions and the recyclable plastic and metals are sorted out manually and the remaining burnable waste is passed on to a mechanical separation unit. Air is added from below and the heavy non-combustible material, such as glass and inert material are separated from the light combustible fractions. Finally, the combustible material is mechanically crushed and chopped into a small fluffy fraction.

In order to produce refuse derived fuels with defined qualities and guaranteed specifications, multi-level processing is required that mainly includes the following stages:

1. Primary shredding
2. Separation of ferrous metal and non-ferrous metal
3. Separation of extraneous material (by e.g. air-steam or ballistic separators)
4. Secondary shredding
5. Pelleting(briquetting)

The RDF processing unit will receive MSW of > 100 mm size and produce RDF through various processes.

(i) The MSW from tipping floor or MSW pit will be conveyed to a trommel screen with >100 mm screen size (depending upon the Physical Characterization of waste). The below 50 mm size will be taken for composting and above 50 mm size will be further conveyed to the main shredder for size reduction. Trommel screens are mechanical segregation devices.

(ii) The shredder cuts the material to a size of less than approx. 100 mm, (can be adjusted by means of changeable bottom screens). Shredders are programmed in such a manner that in case the un-shreddable material is detected, the shredder will be stopped automatically. The foreign object is also automatically discharged to a dedicated container by means of reversible belt conveyor after the following conveyor. In good quality shredders MIPS (Massive Impact Protection System) protects the knives of the shredder in

case of unshreddable material enters the shredder. The shredded material is discharged from the shredder by means of chain/belt conveyor.

(iii) The ballistic separator is used to segregate the heavy inert, glass and metal pieces.

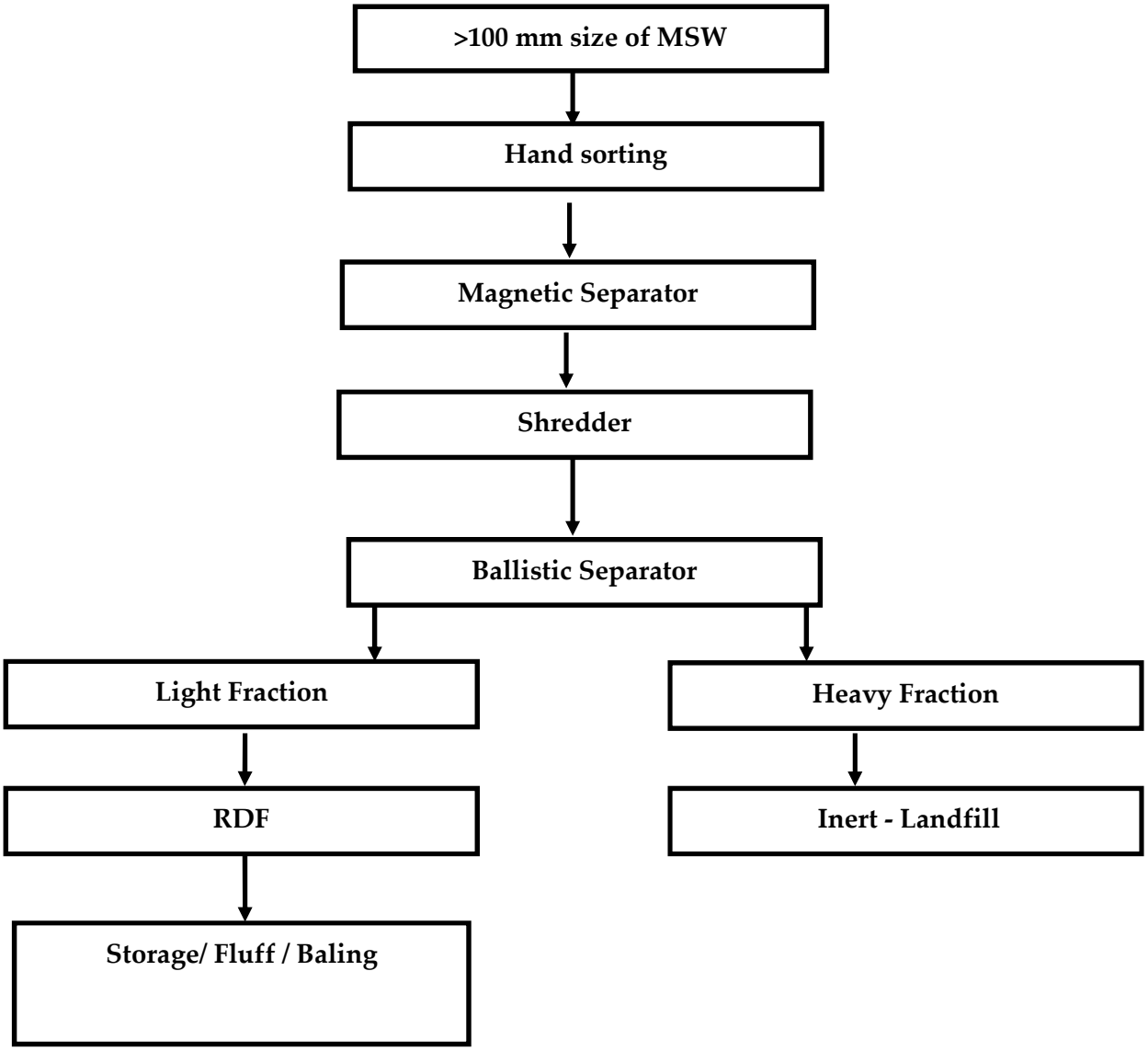

Figure 3-7: Flowchart for RDF Plant

C. Composting Plant

Aerobic composting is the decomposition of organic material by microorganisms to produce humus-like material called compost. It is suitable for the organic fraction of the MSW and agricultural waste such as garden waste, waste from slaughter houses and dairy waste. The compost is most commonly used as soil conditioning. Farmers in India have been using composting for many years to process agricultural waste and cow dung as a conditioner for the purpose of soil improvement. The application for MSW has proven successful and demonstrated in numbers of cities in India. Windrow composting has been found most relevant for large-scale applications in organic solid waste disposal. The compostable fraction mixed with inert material is used for aerobic composting in windrows. The waste is processed for 35 days with regular stir and mixing with bio-culture, which accelerates the degradation.

Elements of composting facility:

a) **Yard Management System:** The around 50 mm fraction of MSW screened in the trommel of pre- processing section is conveyed to the designated areas of compost pad for windrow preparation. In windrow type aerobic composting system, the fresh MSW is stacked in the form of trapezoidal heaps called 'windrows' with sufficient quantity of decomposing microbial cultures, will be inoculated at this point with sprayer to reduce odour and repel vectors. Moisture will also be supplemented at required levels before windrow preparation. The thoroughly mixed waste is then made to windrows of convenient dimensions and kept for the biological decomposition. The windrows are periodically turned (normally once a week) using hydraulic excavators to provide proper aeration and temperature control. The composting heap is stabilized in about 6 weeks, when it is shifted to the screening plant for removal of the inert and non-composted matter. Inside temperature of the windrow may go up to 65^0C.

b) **Coarse segregation system:** Stabilized material from monsoon shed is then fed to the 'coarse segregation section' using a Skid Steer Loader for intermediate screening. Two stage screening system is adopted to achieve maximum screening efficiency using trommel of different hole sizes. Cascading action inside the trommel ensures better screening of the lumpy and highly heterogeneous municipal solid waste. These days equipment in this section are hydraulically driven to ensure greater safety against breakdowns and to lower power consumption. Hydraulic drive also introduces features like on-load starting, centralized control etc. PLC based controls allows automatic shutdown in case of any emergency. Screened material coming out

of this section is uniform in texture and contains semi–stabilized organic compost. This material needs further stabilization so it is transferred to the curing section.

c) **Curing system:** Material coming out of the coarse segregation section is stored in curing section for 15 days for further stabilization and moisture control. Some additives, such as, as rock phosphate may be added at this stage to improve quality of final product. Curing area can hold up to 20 days of material that is brought to the curing section on a daily basis.

d) **Refinement system:** As per compost quality norms, nationally (FCO) and internationally, the compost should be below 4 mm average particle size and it should not contain impurities such as glass, plastic, other inert material etc. which spoils the overall appearance and creates suspicion in the mind of the end user about quality of the final product. This section consists of a trommel screen of 4 mm. The screened material coming out of the trommel screen is sent to the gravity separator which removes heavy impurities such as glass, metals, sand, silica etc. from the organic manure. The magnetic separator in the production line will take care of all kinds of ferrous impurities in the compost. Organic Manure free from major impurities is passed through a liquid add mixer where quality enhancer in powder or liquid form is added. High quality organic manure is then passed through the packing spout and final packing of the product takes place.

e) **Packing and Storage System:** The mechanized packing section can do the bagging, weighment and stitching of 50 kg bags and finally stacked in the finished product store by using a stacking conveyor.

f) **Leachate, litter and Odour Management System:** During composting some dark coloured thick fluid may get generated. This fluid is known as 'leachate'. It should not get percolated in the soil or else it will pollute the ground water. To avoid this, proper concreting of the 'compost pad' is done and a peripheral drain is provided to collect the leachate generated during the process. The leachate so collected has to be suitably treated or recycled over the windrows. The air-borne litter is controlled by providing a high wire mesh. A green belt is provided around the plant.

D. Landfill

The waste going to the landfill is restricted to certain inert material and other unusable waste and will stand for less than 8 percent of the incoming waste. Compactors will be used to arrange the waste in thin layers and to achieve high density of the waste. To minimize the run off to the ground water, the sanitary landfill will have a sealing system consisting of sheets made of plastic material and soil layer with low permeability. The site will be provided with a leachate collection and removal system, which will be

explained in the next section. Sand, silt and soil, which are separated during the segregation steps, are going to be used as earth cover to prevent infiltration. A cover of 10 cm is provided daily and an intermediate cover of 40-64 cm during monsoon

Deposition of waste in conical heaps over the landfill site and spreading these heaps using a tracked bull dozer is a low cost and easy option The lower levels of waste are permanently saturated and free flow of water into and out of the dumped waste will lead to the migration of leachate into the surrounding surface and sub-surface water and thereby contaminating the ground water aquifers.

The other major issue of simple deposition waste will be the formation of anaerobic conditions at the site as the waste deposition thickness increases, giving rise to the generation of landfill gas and thereby creating serious safety concerns in the immediate project influence area.

Leachate Generation and Treatment

Water that percolates through the placed solid waste is known as leachate. During its progress through the waste, the water entrains suspended solids, extracts soluble constituents of the waste and soluble products of the waste degradation process. The composition of leachate depends up on the stage of waste degradation and the types of waste within the landfill. The main components of leachate will comprise:

- Major elements and ions including calcium, magnesium, iron, potassium, sodium, ammonia, carbonates, sulphates, chlorides, etc.
- Trace metals including manganese, chromium, nickel, lead, cadmium, etc.
- Organic compounds including phenols, Poly aromatic hydrocarbons, etc.
- Microbiological components

The quantity of leachate generated will depend on the annual precipitation rates and active area of the landfill. This requires preparation of complete water balance of the landfill site, in accordance with the development phases of the project. It is now too early to anticipate a detailed phasing of the landfill site and hence it is assumed that an area equivalent to the total waste generated in a year would be the active area for the landfill site in the particular year.

However, it is to be noted that the leachate generation trends vary drastically depending upon the quantity of waste deposited every day and the actual quantity shall be estimated by considering the cumulative quantity of waste deposited in the landfill. The quantity estimated here will just give an idea for the area requirements of leachate treatment.

Landfill Gas Generation, Control and Management

Landfill gas is generated due to the degradation of the organic matter in the wastes. Since the landfill material will be basically inert, the landfill gas generation will be minimal. However, a minor portion of un-composted material may also go to the landfill and therefore adequate gas ventilation system has to be provided as a part of the design.

Storm Water Control and Management

The drains of storm water from the active landfill area and processing plant area, adequate drainage facilities are recommended for landfill area. As a part of this, drainage arrangements in each phase of the landfill will have to be constructed and drain towards the existing ravine side of the disposal site. Temporary and permanent drainage ditches would be installed in waste reception area, topsoil storage plant, haul roads, floor preparation areas and waste placement areas.

Clean and contaminated waters will be segregated and discharged to the nearby water body and treatment facility respectively.

Buffer Zones

A vegetative cover will have to be provided as buffer zone between the landfill site and the nearby localities. In addition to the buffer zone, a compound wall/rigid fencing all around the landfill site to a height of 3 m or as suitable, shall also to be constructed, to totally seclude the site from outside activities.

The proposed vegetative cover shall comprise trees and shrubs that improve the visual and aesthetic appearance of the site. In addition the waste reception area, administrative area and segregation areas shall also be provided with vegetative cover to the extent possible.

3.5.4 Proposed Site Infrastructure

In addition to the landfill area, the site shall be provided with the following infrastructure:

A. Waste reception facilities
B. Haul roads
C. Weigh bridge
D. Site Utility Office

E. Top soil storage
F. Support services such as electricity, water supply telephones etc.
G. Site Staff
H. Vehicles and equipment
I. Vehicle and equipment maintenance workshops and

A. Waste Reception Facilities

The waste reception facilities shall comprise of the following

- An approach road to permit two way traffic, metalled and of adequate length to permit the queuing of vehicles
- Site notice board displaying license conditions, hours of operation and site regulations
- Secure and lockable gates at the entrance to the site.
- Cattle grid at the entrance to the waste reception area
- A weigh bridge of 20 ton capacity capable of weighing 20 -25 vehicles per hour
- Weigh booking office with all amenities and preferably computer logging facilities
- By pass lane for non-waste vehicles and emergency services
- Site administration office for site management with all support services
- Amenity block with dining room, toilets and washing facilities
- Small testing laboratory with first aid facilities
- Designated car park area
- Adequate store room
- Work shop for the first line on-site maintenance with all spares and support services
- Adequate site lighting covering all traffic routes

B. Haul Roads

The entire stretch of access road shall be upgraded / paved to a minimum of 8 m width (for two way traffic). All the primary haul roads from the public high way to the waste reception area and the landfill operational area shall be treated as permanent roads and should be constructed as per the standards.

The secondary arterial roads and temporary roads within the site can be of lesser standards, as the locations of these roads will be changing, following the landfill development.

C. Weigh Bridge: The weighbridge operator should have a clear view of the plate and ensure the vehicle being weighed is positioned on the plate. Weighbridge operators should be aware that persons requiring a weighing may deliberately leave a wheel over the edge of the plate to reduce the weight shown.

D. Site Utility Office

Security to the whole of landfill area shall be provided for all 24 hours the day. A compound wall all around the site shall be constructed to provide integrity to the site and also serve as noise barrier to the adjoining areas. The wall can be of masonry or any other suitable material / rigid fence. As unauthorized access to the site may pose significant health and safety risks, warning notices and access control shall be provided at the following locations of the site.

- Plant and equipment compounds
- Waste receipt point
- Leachate and Land fill gas collection and treatment locations and
- Parts of site undergoing construction Vehicles and Equipment

E. **Top soil storage:** Soil erosion removes the top soil that is necessary for organic matter, nutrients, micro-organisms that are requires for plants to grow and shine. Soil conservation is one such step that protects the soil from being washed away. The soil then ends up in aquatic resources bringing in pesticides and fertilizers used on agricultural land. Healthy soil is important for plants to grow and flourish. Taking necessary steps to conserve the soil is part of environmentally friendly lifestyle. There are several ways to conserve soil that can be done through agricultural practices or measures you take at home

F. **Support services such as electricity, water supply telephones etc.:** The entire area of waste reception area and landfill site shall be provided with electricity and backup generators, potable water supply, communication facilities such as phones and efficient surface water drainage. The exact requirements of all these facilities shall be worked out during the detailed engineering phase of the project, before execution.

G. Site Staff

Adequate manpower is required to ensure that the site is constructed and operated successfully. The staff employed shall be sufficiently qualified, trained, competent

and adequately supervised, to ensure efficient functioning of the plant. The type of staff requirement anticipated for the study is presented below.

- Site manager supervising all aspects of construction and operation
- Supervisors overseeing the landfill operations and maintenance
- Resident engineers supervising landfill construction
- Unit Cashiers
- Clerk / Typists
- Weigh bridge clerks
- Stores in-charges
- Vehicle drivers
- Vehicle fitters and mechanics
- Electricians
- Lab technicians
- Environmental monitoring technicians
- Medical and first aid personnel
- Security guards and
- General labour

H. Vehicles and Equipment

The vehicle and equipment envisaged for the plant operations are as listed below. The number of pumps required shall be estimated as per the pumping needs of the facility operator.

- Weigh Bridge
- Tracked Bulldozer
- Tracked Loading Shovel
- Tracked Backhoe / loader
- Grader
- Compactor
- Dump Truck
- Tractor and Bowser / Sweeper
- Van / Pick up
- Pumps

In addition to the above, adequate firefighting equipment shall also be installed to meet the unforeseen fire accident.

I. Vehicle and Equipment Maintenance and Spares

In keeping with good working practice, regular machinery inspections shall be undertaken on weekly basis and preventive maintenance should be practiced. Workshop facilities will be provided on site, for routine maintenance and servicing as required. Sufficient holding of spare parts should be maintained, to keep each landfill facility operational on a continuous basis.

3.5.5 Containment of Potential Pollutants

Containment measures such as double liners at the bottom and lateral sides of the landfill, and surface capping after the land filling is completed, are required to control the pollutants and mitigate subsequent impacts on environment.

I. Basal and Lateral Containment

The basal and lateral containment at the site shall be provided by using in situ natural soils and geological strata of permeability less than $1x\ 10^{-9}$ m/sec. detailed geo-technical investigations, by excavating top soil should be carried out to assess the permeability of the soil. The site preparation and construction of liner will comprise of

a. Site clearance
b. Grading and dozing of the floor at foundation level to provide suitable slope for gravity drainage of leachate
c. Placement and compaction of excavated clay in minimum of four lifts of 250 mm thick with clay placed at or within +4% of optimum moisture content
d. Within each major phase the mineral liner will be laid, as to be continuous at foundation level and will form as the primary containment layer

If the geo-technical investigations conclude soil permeability, not suitable for liners, clay either has to be imported or in situ sandy materials, has to be improved though addition of bentonite under controlled application rates.

II. Surface Capping

To minimize the ingress of water into the site after completion, it is proposed to form an engineered capping layer. This will comprise a multilayer system comprising:

a. A protective layer of graded fine granular material of 100 mm thick and free from objects larger than 10 mm size, placed above the gas drainage layer

over the last lift of waste

b. Sealing layer with a maximum permeability and an equivalent layer of clay 1m thick with a permeability of 1 x 10^{-9} m/sec and
c. A second protective layer with same specifications as mentioned above, placed above the sealing layer

III. Ground and Surface Water Interception and Drainage

Conventional dewatering measures shall be employed within the landfill area to discharge and maintain groundwater levels below landfill foundation level. This will be ensured through

a. Pumping from perimeter trench drains installed on the bunds or from sumps installed below the landfill foundation level for areas undergoing preparation
b. Installation of temporary or permanent surface water interception drainage ditches to carry peak rainfall runoff and prevent flooding of landfill site

IV. Leachate Collection and Removal

The leachate collection shall be achieved through the following measures:

a. Gravity drainage and grading of the floor of the landfill cell to fall into a sump, located at the lowest point of the cell. The gradients shall be 2 per cent for main drainage with 1 per cent cross fall.
b. Installation of leachate drainage blanket above the basal mineral liner over the floor of each cell and partially up the side walls, constructed of free drainage coarse granular fill comprising of graded 50mm crushed rock laid to a depth of 400mm with a permeability of 1 x 10-4 cm/sec.
c. Inclusion of perforated HDPE pipes in the drainage blanket to facilitated leachate flow with pipes laid on a typical spacing of 50m.
d. Overlaying granular drainage blanket with 100m thick free draining fine granular fills of medium to coarse sand to act as a filter and protective layer.
e. Removal of leachate is effected by leachate collection chambers built up with successive lifts of waste and side slope risers located on the site perimeter.
f. The submersible pumps or adductor pumps should be used to remove leachate from the sumps and the collection chambers should be linked by permanent pipe work to the treatment plant.
g. The precise methods and degree of treatment shall accommodate the

fluctuations in leachate generation. However the following steps shall be followed to meet the standards prescribed by the ministry.

- Balancing of leachate flows and volumes
- Redistribution and recirculation of leachate to dry absorptive waste to reduce volume and to enhance the rates of stabilization
- Aerobic processing through lagoons

V. Landfill Gas and Management

The primary measures to restrict the uncontrolled migration of landfill gas from the site will comprise,

a. Low permeability containment layers and systems installed on the base and side walls
b. Permeable gas drainage blanket of 0.3 m thickness laid beneath the capping layer and
c. Vertical gas chimneys vents and extraction wells

The gas drainage blanket will be formed of a layer of fines free, graded granular fill overlain by a layer of fine sand 100 mm thick and provide protection to the capping layer. Chimneys, vents and extractions wells shall be constructed by drilling from the surface of the capping layer. The extraction wells will have an outer diameter of 0.3 m to 1 m and a HDPE well pipe of 0.1 to 0.15 m within well body.

VI. Surface Restoration

The landfill will be brought up to its pre-settlement level in stages and capped off in a program of progressive restoration, to limit the ingress of water into the site and to facilitate the control of landfill gas. The capping will be a composite structure comprising of four layers of an engineered seal designed to prevent water ingress and egress of landfill gas and an agricultural cap comprising of subsoil drainage layer.

A suitable vegetative cover will have to be established on the closed site to ensure slow surface runoff, promote evapo-transpiration of rainfall, retain moisture in the cap and enhance the formation of a soil structure in the agriculture soil.

3.6 Availability of Water Resources/ Power, Energy Requirement and Source

3.6.1 Water Balance

The source of water supply is Municipal Council/Nagar Nigam Rewari (Fresh/Treated waste water). During construction phase, water requirement will be 6-8 KLD and during operation phase total water requirement will be 80.06 KLD.

Water balance during operation phase is given in figure 3.5.

Table 3-4: Water Balance during Operation Phase

Sr. No.	Description	Fresh Water Requirement (KLD)	Treated Water (KLD)	Total Water Requirement (KLD)	Waste Water Generation (KLD)
1.	Employees 45 LPD/per Employee	13.5	-	13.5	8
2.	Tier Washing	-	2.5	2.5	2.5
3.	Dust Suppression	-	5	5	-
4.	Green Belt Development	-	9	9	-
5.	Bio-methanation/composting	-	50	50	38
Total		13.5	66.5	80.06	48.5

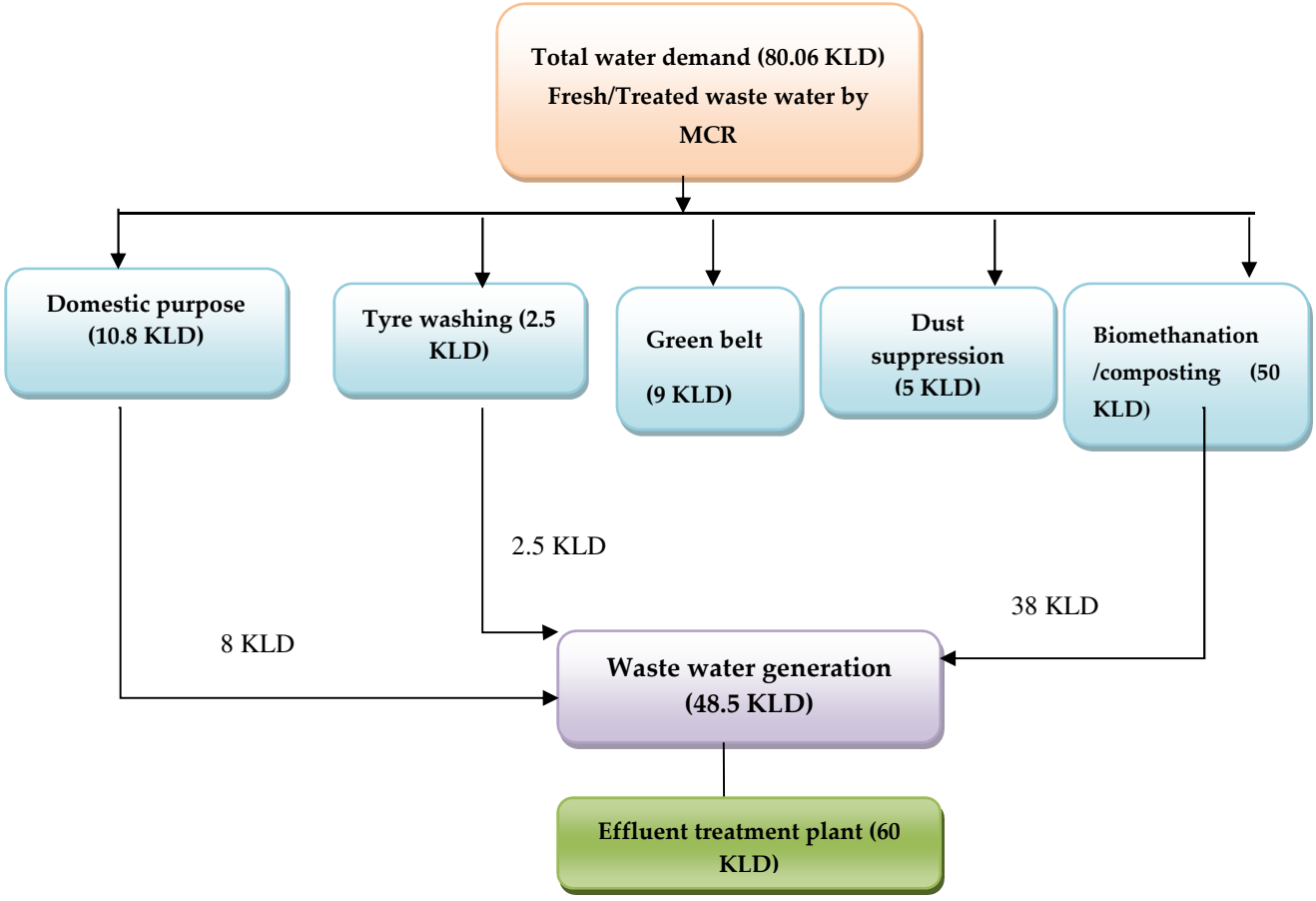

Figure 3-8: Water Balance for Operational Phase

3.6.2 Power Requirement

Power will be sourced from 1 DG sets of 250 KVA during construction phase. Afterwards required power 250 KW will be supply from state electricity board cater to the needs of the MSW processing facility, also 1 D.G set of 250 KVA capacity will be kept on standby.

3.7 Quantity of Waste to be generated

The details about the population and waste generation for Proposed Cluster are given in Table 3.7.

Table 3-5: Waste generation from proposed cluster

ULBs	Area of the ULB Sq.Km	Population projection for 2017	Waste generation in 2017 (tons per day)	Population Projection for 2025	Estimated waste generation in 2025	Population projection for 2035	Estimated waste generation in 2035(Tons per day)
Ateli Mandi, Bawal, Dharuhera, Kanina, Mahendragarh, Nangal Choudhary, Narnaul and Rewari	1594	437363	197	554039	249	744582	335

3.7.1 Leachate/Effluent/sewage Generation

During operation phase, leachate generation will be 25-30 KLD. Leachate will be collected in leachate collection pit and treated in treatment plant and effluent generated to the tune will be treated in Effluent treatment plant. During construction phase, 1.9 KLD of sewage will be generated, which will be disposed off through a soak pit.

3.7.2 Hazardous Waste Generation

Only used oil (category 5.1) will be generated and collected and will be handed over to authorized recyclers. 300 liter/year used oil will be generated.

4 SITE ANALYSIS

4.1 Connectivity

The project site is situated near NH-8 which will cater to the need of transportation of MSW treatment & Disposal facility to the integrated solid waste management site.

Nearest airport from project site is Indira Gandhi International Airport New Delhi situated at an aerial distance of 76.0 km. The site is landlocked and away from sea or waterways.

4.2 Land form, Land Use and Land Ownership

Currently land use of the site is agricultural and belongs to the Municipal Council of Rewari. The application for conversion of land use from agriculture to industrial is in process.

4.3 Topography along with Map

Rewari district of Haryana state lies between 27^0 46', 28^0 28' North latitudes and 76^0 15', 76^0 51' East longitudes. Total geographical area of the district is 1594 sq.km. The Rewari district is divided into three sub-divisions (tehsils) namely Bawal, Kosli and Rewari comprising five-community development blocks viz. Bawal, Jatusana, Khol, Nahar and Rewari for the purpose of administration .The district headquarter, Rewari town falls in Rewari Tehsil.

The district broadly forms part of Indo-Gangetic alluvial plain of Yamuna sub basin. It has vast alluvial and sandy tracts and is interspersed strike ridges which are occasionally covered with blown sand. The Sand dunes attain a height of 30m but on an average they have height of 7 m with respect to surroundings. Some of the dunes support light vegetation where as others are of shifting nature depending upon the direction of wind. The hill ranges are part of great Aravalli chain and contain valuable mineral deposits and natural meadows. The elevation of land in the area varies from 232 m in the north to 262 m above mean sea level in south. The master slope of the area is towards the north.

The topographic map of the study area is given in Fig. No. 4.1

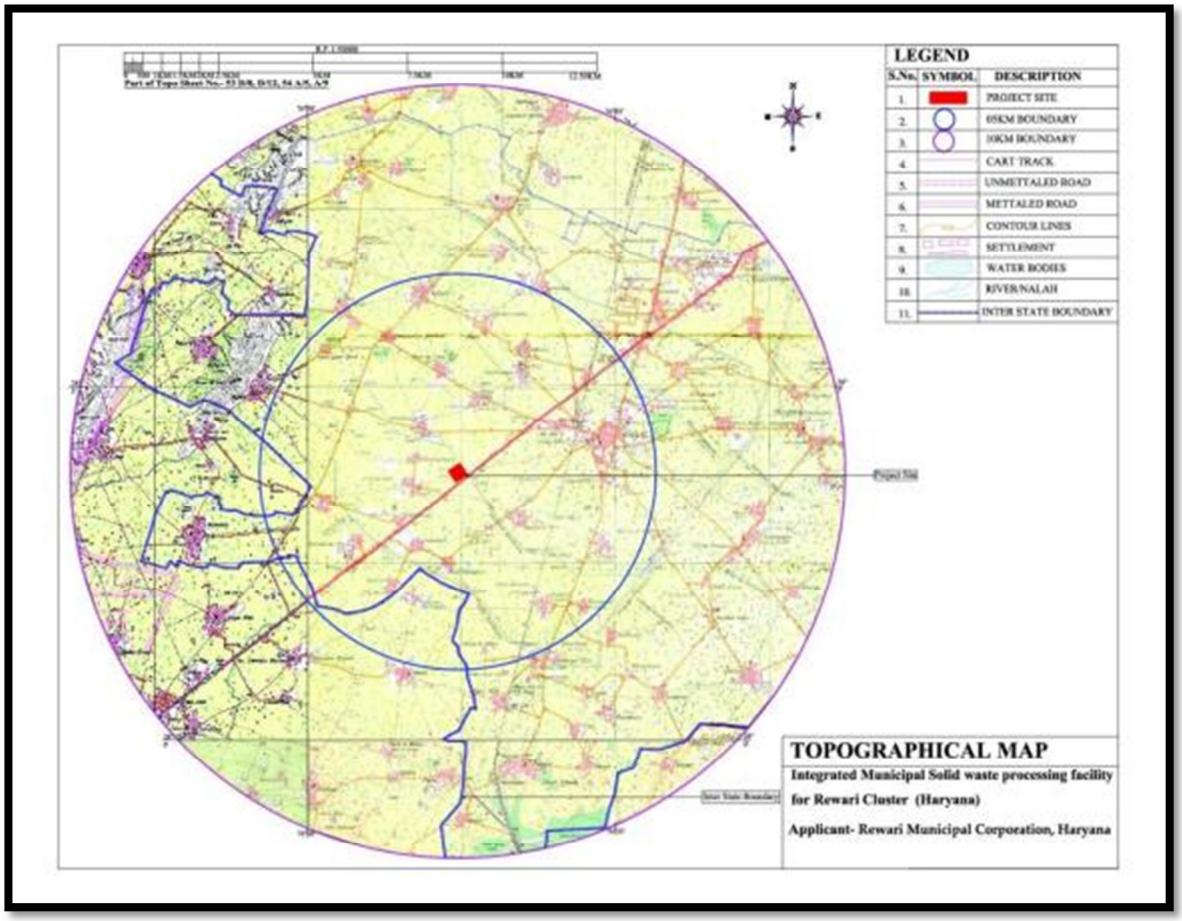

Figure 4-1: Topographical Map

4.4 Existing Land Use Pattern

The existing land is vacant and will be developed as Integrated Municipal solid waste processing facility with the combination of following technologies:

A. Bio-methanation plant

B. RDF Processing Plant

C. Composting Plant

D. Sanitary landfill

4.5 Existing Infrastructure

4.5.1 Environment Sensitivity

Table 4-1: Environment Setting of the Study Area

Sr. No.	Particulars	Details
A.	Nature of the Project	Integrated Municipal Solid Waste Processing Facility
B.	**Size of the Project**	
1.	Expected Waste Quantity	197 TPD
C	**Location Details**	
1.	Village	Near Ramsinghpura
2.	Tehsil	Bawal
3.	District	Rewari
4.	State	Haryana
5.	Latitude & Longitude	**Coordinates Points** / **Latitude** / **Longitude** A. / 28⁰03′42.93"N / 76⁰32′31.29"E B. / 28⁰03′42.48"N / 76⁰32′26.23"E C. / 28⁰03′46.44"N / 76⁰32′25.75"E D. / 28⁰03′47.14"N / 76⁰32′27.85"E E. / 28⁰03′48.81"N / 76⁰32′27.86"E F. / 28⁰03′47.51"N / 76⁰32′33.06"E G. / 28⁰03′45.42"N / 76⁰32′35.71"E
6.	Topo sheet No.	
D	**Environmental Settings of the Area**	
1.	Ecological Sensitive Areas	-
2.	River / water body	**River/ water body** / **Distance** / **Direction** - / - / -
3.	Nearest Town / City	Rewari, 16.1 Km
4.	Nearest Railway Station	Bawal, 3.19 Km
5.	Nearest Airport	Delhi 76.0 Km
6.	State Boundary	Inter State boundary of Haryana and Rajasthan lies at a distance of 2.23 km from project site
7.	Seismic Zone	Zone – IV
D	**Cost Details**	
1.	Total Project Cost	72.65 crore
E	**Requirements of the Project**	
1.	Water Requirement	88.06 KLD
3.	Man Power Requirement (Skilled	250

Sr. No.	Particulars	Details
	and unskilled persons)	

4.6 Climate Data from Secondary Source

The climate in the region shows broadly four seasonal variations, namely:

Winter: December - February

Summer: March – May

Monsoon: June - September

Post-monsoon: October - November

Information presented in subsequent paragraphs is from the Indian Meteorological Department (IMD), Long Term Climatological Tables, 1971 -2000. These tables give useful information about a region's weather, since they are collected over a 30-year period. The temperature of the district is found to be varying between 1.7°C to 43.3°C, and average annual rainfall observed to be 461.6 mm.

4.7 Social Infrastructure

Health

Rewari district is served by number of private and Government hospitals and they provide specialized Clinical service to the Urban as well as Rural population.

Fire and Emergency

Fire Brigades in Rewari Cluster are equipped with high-tech and advanced features to tackle all kind of problems during an emergency. Fire fighters are centrally placed in the city so that they are able to cover all areas to control an emergency situation.

5 ENVIRONMENTAL MITIGATION MEASURES

In consideration to the prevailing site features and the proposed Integrated Municipal Solid Waste Management Facilities, outlined in earlier Chapters, it is necessary to ensure that the proposed plant and facilities would be adequately designed with necessary environment protection measures. This Chapter accordingly outlines the environment protection measures for the proposed Integrated Municipal Solid Waste management at Rewari site comprising of Compost Plant and Sanitary Landfill. During project implementation period special emphasis would be made on measures to minimize leachate/ effluent generation and dust control at source. The sources and types of pollution with broad level mitigation measures is outlined in the following sections.

5.1 Air Pollution Control Measures

Air environment including Ambient Air Quality and odour generation due to the proposed project during construction and operational phases would be accounted. The principal sources of air pollution are construction activities, truck movement with construction materials and municipal solid waste, loading and unloading of materials, vehicular exhaust.

The impact is generally confined to the project area and is expected to be negligible outside the project site boundaries. The pollutants their sources and mitigation measures to be adopted are presented in Table 5-1.

5.2 Water Pollution Control Measures

The water demand for the project which would be in the range of 80.06 KLD. No surface water would be tapped. The source of water would be the Municipality.

The main wastewater generation sources during construction phases would be equipment washed water and other surface run-off with suspended solids loading and sewage from temporary sanitary facilities with BOD loading.

During construction activity the surface run-off would be diverted to working pit to arrest the suspended solids if any and the settled water would be reused for construction purposes, and for sprinkling on roads to control the dust emission, etc.

During operation phase, the wastewater would be from drinking and sanitary use, leachate from compost plant and secured land fill area. The domestic wastewater would be treated in septic tank followed by Soak pit. Maximum leachate generation from the operating cell of landfill pit and other areas including compost pads would be in the tune of 6 cum/hr.

Leachate generated at various places in the plant would be collected in a pond and properly treated in an ETP of capacity of about 2 cum/hr. The treated leachate would be sprayed on windrow to maintain suitable temperature and moisture. Leachate generated during precipitation period would be stored in evaporation pond.

Based on the rainfall intensity of the plant area, separate storm water drainage system would be properly designed. Storm water would be collected in a centralized pit to arrest the silt particulates and clear water would be used locally for landscaping and fountains. Surplus water would be released into public drains or adjacent nala. The pollutants their sources and mitigation measures to be adopted are presented in Table 5-1.

5.3 Solid Waste Disposal

During the construction phase, the solid waste would be different types of raw materials such as coarse aggregate, fines aggregate, bricks, steel etc. being used during construction stage. The solid waste generated during this period would be predominantly inert in nature.

During operation phase no solid waste would be generated as such except ETP sludge or particulates settled in evaporation ponds of nominal quantity. Appropriate management of solid rejects from different processing activity would be undertaken. Sanitary landfilling would be adopted for rejects generated from processing, ETP sludge and evaporation pond settled particulates. The total generation of solid waste would be in the range of 8-10 TPD. The pollutants, their sources and mitigation measures to be adopted are presented in Table 5-1.

Table 5-1: Environmental Mitigation Measures

Sl. No	Pollution Source	Pollution Emitted	Mitigation Measures
Air pollution Mitigation Measures			
1.	Construction activities	SO2, NOX, Particulates, Odour etc.	• Dust suppression by water sprinkling. • Bitumen covered internal roads. • Wheel Washing Bay at the entry point. • Vehicles carrying of construction materials and waste to be covered with tarpaulin / plastic sheet. • Proper ventilation and moisture in the compost plant and windrow area to be maintained and herbal insecticides to be sprayed around odour generation areas at regular intervals. • Secured landfill except the current waste handling area rest to be covered by polyethylene sheets • Green belt would be provided along the internal roads and plant boundary
2.	Vehicular Movement		
3.	Loading and unloading of Trucks		
4.	DG Set		
5.	Processing of waste		
Water Pollution Mitigation Measures			
6.	Domestic Waste	Suspended Solids, BOD etc.	• Septic Tank/Soak Pit. • ETP for recycling. • Impermeable liner in the landfill pit. • Storm water drainage system for recycling
7.	Leachate from Windrow Compost Plant		
8.	Leachate from landfill		
Solid Waste Management			
9.	Construction	Construction materials e.g. coarse aggregate, fines aggregate, bricks, steel etc.	• Recycled or used for filing/ levelling of low-lying areas within the site or transported outside.
10.	ETP sludge or evaporation pond	ETP sludge or evaporation pond settled Particulates	• Sanitary Landfilling

5.4 Noise

Noise pollution will result from transportation and during construction phase. To reduce noise pollution, high-grade machinery would be used. There would not be any major noise-causing activity during operational phase. DG set operation would have proper in-built noise control measures.

5.5 Ecology of the Area

Site clearing or operational activities would not impact the ecology of the area adversely, since there are no known rare, endangered or ecologically significant animal and plant species in the area. There is no wildlife sanctuary located within 10km radius of the project site. In fact the scientific processing and landfilling would have a beneficial impact on the surrounding terrestrial and aquatic ecology.

5.6 Green Belt Development

In order to arrest wind borne fugitive dusts around the plant boundary with about 3-5 m wide green coverage based on locally available plant species. An area of 10-12% would be earmarked for development of greenbelt/greenery along the boundary, roads, and in open places available. The green belt developed would help to capture the fugitive emissions, attenuate the noise generation and improve the aesthetics. All open spaces, where tree plantation may not be possible, would be covered with shrubs and grass to prevent erosion of topsoil. Apart from green belt all around the site, also on the top of capped landfills greenery would be developed.

5.7 Environmental Monitoring

Monitoring for air quality parameters as per NAAQS 2009 and surface water quality would be carried out on a six monthly basis. The ground water quality monitoring carried out quarterly once. Programs would be conducted on a regular basis for monitoring safety and health protection of workers with specific reference to improving rag pickers quality of life, health concerns, etc.

6 PLANNING BRIEF

6.1 Planning Concept

The proposed project is an Integrated Municipal solid waste processing facility. As this is an existing dumpsite fresh site basic facilities of infrastructure like admin building, processing area, Laboratory, Leachate treatment system Landfill vehicle parking, Staff vehicle parking, Panel room, Weigh bridge with cabin, Circulation area, internal roads etc. will be developed at the site. Transportation of Solid waste will be carried out through the existing road network around the site.

6.2 Assessment of Infrastructure Demand (Physical &Social)

Key infrastructure such as hospitals, schools, bank, places of worship and social/ community facilities such as park, market, playground etc. education, health care and community development are available in Rewari. Internal roads, canteen, office, laboratory and parking facilities will be provided at the site. Temporary shelters will be provided to workers.

6.3 Amenities/ Facilities

Basic Amenities like public transport, water supply, telecommunications, educational institutions, hospitals etc. are available in Rewari.

The following facilities/amenities will be extended by the proposed project:

- Arrangements for safe and healthy working conditions & temporary rest shelters
- Provision of drinking water
- Provision of PPE
- First-aid facilities and health check-up camps for the workers
- Conducting medical camps for workers and nearby villagers at regular interval
- Provision of firefighting system

6.4 Green Belt

Around 33 % of the total project area i.e. 4.82 acres (14.625 acres) of land will be developed as green belt. The green belt will be developed considering the native species and CPCB guidelines will be followed

6.5 Connectivity (Road/Rail/Waterways)

The proposed Integrated MSW processing unit is well connected to Road/Highways for transportation of MSW.

6.6 Drinking Water Management

During operational phase the water for domestic purpose to the tune of 13.5 KLD will be sourced from Ground water/ Municipal water supply. Water requirement for other than domestic purposes i.e. 66.5 KLD will be sourced from treated waste water by Municipal co-operation, Rewari. During construction phase 8 KLD water will be supplied by the Municipal Council of Rewari.

6.7 Solid and Industrial Waste Management

The solid waste from Rewari will consists of three main constituents i.e. compostable, recyclable and inert. Compostable and recyclable wastes are very valuable so far as the composting is concerned, while the inert waste and processing rejects will be disposed of into the landfill. The municipal solid wastes generated during the operation phase will consist of papers, cartons, Thermocol, plastics, polythene bags, Glass, etc. Solid waste will be generated from households, restaurants, and markets located in Rewari. The quantity of solid wastes generated will be approximately 197 ton/ day in 2017 and it will reach upto 335 ton/day by year 2035. Life of the landfill will be twenty years. Biodegradable waste will be treated at camp site. The recyclable waste will be sold to recyclers.

6.8 Hazardous Waste Generation

Generated Spent oil from D.G sets (category 5.1) will be collected and handed over to authorized recyclers. Approximately 300 liter/year used oil will be generated.

6.9 Power Requirement and Supply Source

1 D.G set of 250 KVA will be utilized for power during construction phase. During operation phase 250KW power will be taken from of State Electricity Board and for emergency 1 D.G set of 250 KVA will be utilized as backup.

6.10 Resettlement and Rehabilitation Plan

Not applicable as this is an existing site and the ownership of the land is with Municipal Council Rewari.

7 PROJECT SCHEDULE AND COST

7.1 Project Cost

Total capital cost is INR 72.65 Cores and operation and maintenance cost is proposed to be 6% of Capital Cost i.e. approximately 4.4 Crores.

7.2 Likely Date of Start of Construction

The construction work will begin after obtaining statutory clearance from Ministry of Environment Forest and Climate Change and Consent from State Pollution Control Board.

7.3 EMP Budget

Table 7-1: EMP Budget

Sr. No.	Particulars	Capital cost in lacs	Budget in lacs (per Year)
1	Environmental Pollution control (Air, water, Soil, Noise etc.)	9.0	0.50
2	Environment Monitoring	-	1.2
3	Occupation	2.0	0.50
4	Green Belt	2.0	0.50
Total		**13.00**	**2.7**

7.4 Budgetary Break up for Labour

Table 7-2: Budgetary Break up for Labour

Sr. No.	Activity	Budget in lacs/Year
1.	Safe Drinking Water	0.50
2.	Urinal , Latrine and Bathrooms	1.00
3.	PPE and Safety equipment will be Provided	0.20
4.	First Aid facility	0.20
5.	Regular Health checkup and provision of medicine	0.30
6.	Educational and awareness programme for safety measures & Recreational program	0.30
Total		**2.5**

7.5 Budget for CSR Activities

Table 7-3: Budgetary for CSR Activities

Sr. No.	Activity	Capital cost in lacs/Year	Recurring Cost in Lacs
1.	Education welfare: scholarship for students in nearby govt. school	2.5	1.2
2.	Medical/ Health Camp: organize health check-up camps	3.0	0.8
3.	Area development: provide assistance to nearby village panchayat for area development.	5.0	--
Total		**10.5**	**2.0**

8 ANALYSIS OF PROPOSAL (RECOMMENDATION)

8.1 Social Benefits Better Living Conditions

No open dumping will be carried out. This will reduce the chances of air, water & soil contamination and also will reduce emission odour. This will improve the living standard of society & will provide safe & hygienic surroundings.

Improved Health Conditions

Efficient waste collection & disposal of waste will make the living & health condition in the area better. Littering waste creates nuisance due to unpleasant view and emission of foul odour. It also provides ground for breeding of mosquitoes & disease causing pathogens. The Integrated Solid waste management project will ensure timely collection of waste, efficient treatment & disposal in scientific & environment friendly manner. This will reduce the chances of spread of diseases. Project will improve the health condition of the area

Enhancement of Aesthetic Value of Area

Cattles & other stray animals roam around the existing open dump site. This creates disturbance to society. Scavenging birds hover above the open dump site which may pose significant threat to aircrafts. Open dumping of waste also creates an unpleasant view and leads to emission of foul odour.

Through this project, scientific technology and methodology shall be used or waste management in this cluster. This will reduce bird menace. An entry gate & wired fence will be provided around the project site to prevent entry of stray animals & cattle. A thick green belt will also be developed around project site. The project will lead to improvement in aesthetic value of the area.

Direct & Indirect Employment Opportunities

Development of this project will provide employment opportunities to local skilled, unskilled & semi-skilled people during both construction & operation phase.

Indirect employment may also be generated during construction phase of project.

8.2 Economic Benefits Revenue from Waste

Waste is material that is being rejected as it has no use for the people. Project comprises of collection of waste, waste processing & safe disposal. From waste following products will be recovered, which can generate revenue:

1) Recyclables
2) Compost
3) Inert waste as filler material.

Improved Economic Status

Project will generate both direct & indirect employment. Local people will be preferred for giving employment. This will improve economic status of the area. Emigration of local people to other parts of state/country due to unavailability of employment will be reduced.

Conservation of Natural Resource

Compost produced is rich in nutrient & serve as organic manure. Application of this manure saves fertilizers. This is cost effective for farmers as it is cheaper than fertilizers& also prevents soil salinity & Eutrophication.

8.3 Environmental Benefits

Prevention of Air, Water & Soil Contamination

No open dumping of waste will be carried out, which leads to soil, water & air pollution. Also littering waste is ground for breeding mosquitoes, which become agents of various deadly diseases.

This project involves scientific management of waste which will prevent environmental pollution & spread of disease.

Development of Green Belt

Green belt developed along with lawns & green buffer at site. This will help in attenuating dust & noise level at site.