State Strategy on Solid Waste Management – Himachal Pradesh

Department of Urban Development, H.P. May, 2019

A guidebook on Solid Waste Management for Urban Local Bodies

Background:
The Ministry of Environment, Forest and Climate Change had notified “Solid Waste Management Rules, 2016” in April, 2016 which specifically defines the roles and responsibility of different stakeholders. Accordingly, state Government has taken following steps at State level till date for compliance of above rules as required under rule-11 of SWM Rules, 2016:

✓ H.P. State Policy on Solid Waste management notified
✓ H.P. State Solid Waste Management Action Plan has been prepared
✓ Draft bye-laws on SWM, incorporating all provisions of SWM Rules, 2016 prepared and circulated to all ULBs
✓ Scheme for registration of rag-pickers & scrap-dealers developed
✓ Waste Characterization study conducted in the State through NEERI
✓ ULB wise Action Plans prepared
✓ Composting guidelines prepared & circulated to ULBs

In addition, a Plastic Waste Management Action Plan also has been prepared for the State.

Further, in order to establish Solid Waste processing & disposal facilities in the State on PPP mode, the State Govt. had earlier adopted cluster-based approach in the year 2017. The Department of Urban Development jointly with H.P. State Pollution Control Board had identified 5 major clusters and 25 sub-clusters for management of non-biodegradable and biodegradable waste separately. Total 8 clusters were finalized where the adequate land parcels were identified for setting up of these facilities. The pre-feasibility studies for finalized clusters was conducted by HPSPCB and the Tender documents were prepared by H.P. Infrastructure Development Board (HPIDB). The main reasons for adopting cluster-based approach were:

❖ To identify common land parcel for cluster of ULBs as finding land parcel in each ULB is difficult.
❖ To attract private investment in Solid Waste Management and outsourcing the Operation & Maintenance part by developing the SWM facilities on PPP mode.

❖ To address the problem of lack of technical manpower & adequate capacity in ULBs to maintain & operation SWM facilities.

Despite lot of efforts, the State had to abandon the cluster approach due to following reasons:

× Large land parcel required but adequate land parcels not available.
× Land identification, transfer and tendering on PPP mode, a time-consuming process.
× Lesser turn out of developers due to small projects.
× Smaller land parcels identified in the meanwhile within the ULBs

Keeping in view the above factors, the decentralized approach has now been adopted by the State.

**State Profile:**

- **No. of ULBs** - 54 (2-Municipal Corporations, 31-Municipal Councils & 21-Nagar Panchayats)
- **Population (Urban)** - 7.13 lacs
- **Total Urban Area** - 279.88Sq Km.
- **% of total State population** - 10.38
- **Total waste generation** - 370 TPD (approx..) (Quantity shows steep variations during summer & winter season due to huge influx of tourists)
- **Total biodegradable/wet waste generated** - 190 TPD (approx..)
- **Total non-biodegradable/dry waste generated** - 150 TPD (approx..)
• Average temperature - The average temperature in H.P. varies from 22 degrees to 37 degree Celsius in summer and from 0 degree to 15 degree Celsius in winters.

Waste Characteristics as per NEERI study:

![Waste composition chart]

Strategy for Management of Solid Waste in the State:

Collection: As per the SWM Rules, 2016 the garbage collection is to be done from the door step of the waste generators and in case of multistory buildings, complexes, the waste shall be collected from the entry gate or any other designated location. In SWM Rules, 2016 the duties of waste generators have been defined as below:

• **Rule 4(1)(a)** – Segregation of waste at source into three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes
• **Rule 4(1)(b)** - wrap securely the used sanitary waste like diapers, sanitary pads etc., and hand over the same separately to authorized person of ULB.
• **Rule 4(2)** – Not to throw, burn or bury the solid waste on streets, open public places or in the drain/water bodies.
• **Rule 4(3)** – Shall pay user fee for solid waste management, as specified in the bye-laws of the local bodies.

• **Rule 4(4)** – Not to organize an event or gathering of more than one hundred persons at any unlicensed place without intimating the local body, at least three working days in advance.

• **Rule 4(5)** - Street vendors to keep suitable containers for storage of waste generated during the course of his activity.

• **Rule 4(6)** – The Bulk Waste Generators i.e. the waste generators generating more than 100Kg waste per day or as specified by ULB in its by-laws, shall manage the biodegradable portion of their waste within their own premises.

To comply with the provisions of SWM Rules within the ULBs, the State Govt. has adopted a strategy of segregation of waste at source into 3 main streams as below:

- **Biodegradable waste**
  - Waste which contains organic material which can be degraded into manure by micro-organisms e.g. vegetable peels, left over food, rotten fruits/veg. dry leaves etc.

- **Non-biodegradable waste**
  - It is the material which cannot be degraded into simpler compounds by micro-organisms such as plastic, metal, toffee/chips wrappers, glass etc. In addition, the sanitary waste such as sanitary napkins, diapers etc. shall be wrapped securely and handed over to garbage collector in non-biodegradable bin.

- **Domestic Hazardous Waste**
  - Discarded medicines, syringes, paint drums, pesticide spray cans, tube, bulb etc.

All the ULBs shall develop mechanism to collect & transport the waste in segregated manner only by making necessary changes, in their collection/transportation system as per locally feasible method.

The door to door collection of segregated waste has been started in most of the ULBs however the source segregation needs to be improved.
The commonly found items in household waste and their segregation into 3 components is illustrated in the picture below:

Further, in order to assist ULBs, for management of Solid Waste in scientific manner, following strategy has been developed to be adopted by all ULBs for management of Solid Waste in scientific and sustainable manner:

**For Bio-degradable waste:**

**Aerobic Microbial Composting Pits:** The Aerobic microbial composting pits are the best suitable method for managing organic/biodegradable/wet waste. These pits shall be developed in the ULBs. ULBs shall practice following:

- Construction only the aerobic honeycomb model pits for composting
- Put only the segregated biodegradable waste in compost pits
- Use enzymes/microbes to decompose the waste faster (Suggestive list of microbes suppliers is at **Annexure-A**.)
Note: The detail guidelines for developing aerobic pit composting facility has already been issued to all the ULBs and is also available on DUD website.

The suggestive design for developing honeycomb aerobic compost pits is enclosed at Annexure-B.

For Non-Biodegradable waste:

Development of Material Recovery Facility (MRF): To manage the non-biodegradable waste, MRF is to be developed in all ULBs. MRF shall be used for following:

- To sort/ segregated dry/non-biodegradable waste further into recyclable and non-recyclable and shall sell/hand over the same to recyclers duly authorized by H.P. State Pollution Control Board (list attached at Annexure-C & available on HPSPCB website) or sell the same to the scrap-dealers registered with the ULB.
- The recyclable waste shall be channelized for recycling through rag-pickers/ scrap-dealers.
- Non-recyclable combustible material in non-biodegradable waste shall be tied up and shall send the same to nearby cement industry for co-processing or hand over the plastic waste to HPPWD for road construction.

The suggestive design for developing MRF is enclosed at Annexure-D.
Figure 1: Concept of MRF

Figure 2: MRF at Kerala
Figure 3: Solid & Liquid Resource Management Centre, Ambikapur, Chhatisgarh

Figure 4: SLRM model Ambikapur, Chhatisgarh
Separate collection & treatment of sanitary waste: For managing sanitary waste, ULBs may install waste incinerators at the Waste Processing / Material Recovery Facilities (MRF) sites, till then all the ULBs may store the sanitary waste separately in suitable containers. All the waste generators have to wrap securely sanitary waste and hand over to authorized waste collector along with non-biodegradable waste. The Department shall install sanitary waste disposal incinerators in all the ULBs where sanitary waste such as sanitary napkins, diapers etc. shall be disposed of.
**For Domestic hazardous waste:**

To manage the domestic hazardous waste, hazardous waste deposition centers/kiosk shall be developed in all ULBs, where waste generators can deposit their domestic hazardous waste. Atleast one kiosk shall be developed in each ULB and in bigger ULBs even more kiosks shall be developed keeping in view the requirement of ULB. In addition, the domestic hazardous waste shall also be collected from the door step of generators through door to door garbage collection (atleast once in a week). All ULBs shall store this waste separately & securely at their dump sites and shall compulsorily have tie-up with hazardous waste treatment, storage & disposal facility (TSDF). At present there is only one authorized TSDF in the State of H.P. i.e. M/s Shivalik Solid Waste Management, Dabhota, Nalagarh. The hazardous waste TSDF shall lift all the hazardous waste and dispose of this waste at their facility. The suggestive design for developing hazardous waste collection center/kiosk is enclosed at Annexure-E.

**Operation & Maintenance of above equipment/machineries:** The operation & maintenance of solid waste processing facilities is vital aspect in order to sustain the waste management system. Hence, necessary capacity building at ULB level shall be done by the equipment suppliers by providing them training on operating the machineries. Dedicated manpower shall be deployed by all ULBs in these facilities which shall supervise, operate, maintain records etc. ULBs shall also make efforts to integrate rag-pickers and encourage them to provide their support in managing these facilities.

Further to assist the ULBs, the centralized procurement by the Directorate or Urban Development shall be done in order to have uniformity in specifications and outcome desired out of the machineries.

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<th>S.No.</th>
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<th>Contact details</th>
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<td>1</td>
<td>NARMADA BIOTECH LTD.</td>
<td>8989521999, <a href="mailto:pranayhiran@rediffmail.com">pranayhiran@rediffmail.com</a></td>
</tr>
<tr>
<td>2</td>
<td>Excel Industries Limited</td>
<td>022-66464342, <a href="mailto:owc@excelind.com">owc@excelind.com</a></td>
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<tr>
<td>3</td>
<td>Eco Support Pvt. Ltd.</td>
<td>9920461282/9892831668, <a href="mailto:ecosupindia@gmail.com">ecosupindia@gmail.com</a></td>
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<td>4</td>
<td>Ecoman Enviro Solutions Pvt Ltd</td>
<td>7720999222, <a href="mailto:parimal@ecoman.in">parimal@ecoman.in</a>; <a href="mailto:vaibhav@ecoman.in">vaibhav@ecoman.in</a></td>
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<td>5</td>
<td>Shudh-Labh Solutions Pvt Ltd</td>
<td>080-49516689, 09880710830, <a href="mailto:ramanan@sudh-labh.in">ramanan@sudh-labh.in</a></td>
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<td>6</td>
<td>Smart Enviro Systems</td>
<td>Mr. Rakeshprashar, Email ID: <a href="mailto:prashar_rakesh@yahoo.in">prashar_rakesh@yahoo.in</a>, Mobile Number: 09871443052</td>
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<td>7</td>
<td>Alfa Therm Limited</td>
<td>Vijay Saroj -9958692424, <a href="mailto:vijay@alfatherm.in">vijay@alfatherm.in</a></td>
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<td>8</td>
<td>Vermigold Ecotech Pvt Ltd</td>
<td>Mr. Amol Chorghe, 919619664810, <a href="mailto:amolc@vermigold.com">amolc@vermigold.com</a></td>
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PROPOSED DESIGN OF COMPOSTING PITS

ELEVATION OF INTERMEDIATE WALL CC

ELEVATION OF OUTER WALL BB

PROPOSED DESIGN OF HONEYCOMB AEROBIC COMPOSTING PITS

SPECIFICATIONS

1. The floor of the pits shall slope towards the centre to allow for the collection of leachate in the manhole constructed for the collection of the same.
2. The manhole in each pit will be connected to the larger manhole constructed outside the pits with 100 mm dia PVC pipes sloped at 1:10.
3. The larger manholes shall be connected to the main leachate pool with 150 mm dia PVC pipes laid at the slope of 1:20.
4. The partitions of the pits shall be 4 inch thick honeycomb brick wall.
5. Corners of the pits shall be constructed with 150x50 mm RCC section welded face to face connected with the bottom beam with gusset plate.
6. The channel pillars shall have 50 mm cover till the pit height.
7. The depth of the aerobic compost pits shall be 450 mm above the ground level.
8. There shall be RCC plinth beam. Other/alternative materials could be used to construct the pits after conforming to the loading design of the pits.

ALL DIMENSIONS SHALL BE IN METERS UNLESS OTHERWISE SPECIFIED.

PLEASE DO NOT SCALE THE DRAWING.
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name and Address of the Facility</th>
<th>Type of Hazardous Waste Recycled</th>
<th>Authorized Recycling/Utilization/Co-processing Capacity (MTA)</th>
<th>Quantity Recycled/Utilized/Co-processed (MT)</th>
<th>Registration valid upto (DD/MM/YYYY)</th>
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<td>M/s Rama Metal Company, Village Jhron, Behind DCC Industrial Area, Kala Amb, Distt. Sirmour (HP)</td>
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<td>589.624</td>
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<td>3</td>
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<td>500</td>
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<td>K.K. Enterprises</td>
<td>VPO Daslehra, Tehsil Jhandutta, Distt.Bilaspur, HP</td>
<td>Lead acid battery plates and other lead scrap</td>
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<td>Authorisation granted on 19/12/2017</td>
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<td>M Rauf Enterprises</td>
<td>Khasra No 1747-53 Morepen Road, Vill. &amp; P.O. Thana Tehsil Baddi Distt Solan (HP)</td>
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<td>Gulshan Trading Co.</td>
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<td>8049 Nos.</td>
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<td>M/s Shivalik Solid Waste Management Ltd.</td>
<td>Village Majra, P.O. Dhahiot, Tehsil Nalagarh</td>
<td>Cleaning &amp; Washing of Contaminated Drums</td>
<td>28800 Nos.</td>
<td>26802 Nos.</td>
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Annexure-E

CONCEPTUAL FLOOR PLAN OF HAZARDOUS WASTE COLLECTION CENTRE

SPECIFICATIONS

a. Flammable, ignitable reactive and non-combustible wastes should be stored separately and never should be stored in the same storage shed.
b. Storage area may consist of different sheds for storing different kinds of incombustible hazardous wastes and sheds should be provided with suitable openings.
c. Adequate storage capacity (i.e. 50 % of the annual capacity of the hazardous waste incinerator) should be provided in the premises.
d. Storage area should be designed to withstand the load of material stocked and any damage from the material spillage.
e. Storage area should be provided with the flameproof electrical fittings and it should be strictly adhered to.
f. Automatic smoke, heat detection system should be provided in the sheds. Adequate fire fighting systems should be provided for the storage area, along with the areas in the facility.
g. There should be at least 15 m distance between the storage sheds.
h. Loading and unloading of wastes in storage sheds should only be done under the supervision of the well trained and experienced staff.
i. Fire break of at least 5 m. between two blocks of stacked drums should be provided in the storage shed. One block of drum should not exceed 300 MT of waste.
j. The storage and handling should have at least two routes to escape in event of any fire in the area.
k. Doors and approaches of the storage area should be of suitable sizes for entry of fork lift and the fire fighting equipment.

LEGEND

S = 1 M X 1 M STORAGE BINS
ALL DIMENSIONS ARE IN METERS.
SCALE - 1:100