FIELD VISIT REPORT
ON
GUJARAT ENVIRO PROTECTION & INFRASTRUCTURE LTD

सत्यमेव जयते

GOVERNMENT OF PUDUCHERRY
DEPARTMENT OF SCIENCE TECHNOLOGY AND ENVIRONMENT
PUDUCHERRY POLLUTION CONTROL COMMITTEE
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Field Visit Report to M/s. Gujarat Enviro Protection & Infrastructure Ltd. (GEPIL), Ranipet, Vellore District, Tamil Nadu

1. Introduction

While discussing the proposal of M/s. Nikesh Enterprises for establishing Hazardous Waste Pre-processing facility at Thuthipet, Puducherry in the 158th PPCC meeting held on 02.07.2018, it was decided that the Officials of DST&E along with the HOD of Chemical Engineering Department, Pondicherry Engineering College shall inspect similar facility located in Tamil Nadu and submit a report on pollution aspects for further consideration of the proposal.

Accordingly field visit to the Hazardous Waste Pre-processing facility of M/s. Gujarat Enviro Protection & Infrastructure Ltd. located at Ranipet, Vellore District, Tamilnadu was carried out by the following team of members on 22.01.2019 (Figure 1):

i) Prof. G. Srinivasan, HOD, Chemical Engineering Department, Pondicherry Engineering College, Puducherry.
ii) Dr. R. Sagaya Alfred, Senior Scientific Officer, DST&E.
iii) Thiru. K. Kalamegam, Junior Engineer, DST&E.
iv) Thiru. S. Devaanandan, Assistant Environmental Engineer, PPCC.

Figure 1. Team constituted for the field visit to M/s GEPIL

M/s. Gujarat Enviro Protection & Infrastructure Limited is operating the Hazardous Waste Pre-Processing Facility at Plot No. S-60, Sipcot Industrial Complex, Phase-3, Nellikuppam, Ranipet, Vellore District, Tamilnadu - 632 405. The unit is also called Alternate Fuel Resource Facility (AFRF) as the pre-processed hazardous waste is used as fuel in the Cement Kiln.

The unit was established with handling capacity of 25,000 TPA in 2012 and it is now increasing the capacity to 75,000 TPA. The unit presently processes 200 MT/day of HW in 5 batches. The total area of the unit is 3 acres. Organic / incinerable / inert hazardous wastes are collected from generators and are processed / blended in the facility to prepare Alternate Fuel / Wastes Mix suitable for Co-processing in cement plants.

Table 1.1 Types of Hazardous Wastes pre-processed in the facility:

Industrial Hazardous Waste	**Industrial Non Hazardous Waste**
ETP/CETP Sludge's	Plastic Waste
Paint Sludge / Grinding Sludge / Chemical Sludge	Resin Waste
Off specification waste	Paper Waste
Other liquid, s/s and solid hazardous waste; suitable for pre-processing.	Other non-hazardous waste suitable for pre-processing

Table 1.2 Sector Wise Details of Wastes received by the Facility:

S.NO	**Sector**	**Type of waste**	**Physical form**
1	Automobile Manufacturing	Wastes & Residues containing oil / paint sludge /Sludges	Semi Solid / Solid
2	Engineering	Oil sludge / Paint sludge	Semi Solid
3	Drugs & Pharmaceuticals	Distillation Residues / Spent Carbon / Solvents	Semi solid / Liquid
4	Chemical	Distillation residues / Tarry residues / aromatic residues	Liquid
5	Aluminum (others)	Off gas treatments	Liquid / Solids

6	Glass Manufacturing	Oil containing residues	Solids
7	Bulk drugs	Spent catalyst / carbon	Solids
8	Electronic	Chemical coating wastes	Solids
9	Confectionary	Residue containing oil	Solid
10	Cement	Residues containing oil	Solid
11	Pulp & Paper	Pulp containing adsorbable organic	Semi solid
12	Fertilizer	Spent Oil	Liquid
13	Re Processing	Oil sludge / cargo residues	Solid
14	Pesticide formulations	Chemical	Liquid
15	Paint	Chemical Sludge	Solid
16	Power Plant	Residues containing oil / wastes	Liquid
17	Tannery	Chemical bearing residues / sludges	Liquid / Solids
18	Pesticides	Chemical sludge / Process wastes	Liquids
19	Others	Residues / Alkali wash of fuel / Oil skimming residues / Sludge	Liquids / Solids
20	Refinery	Bottom Residue/ organic sludge/ distillery residues	Liquid/ Solid/ Semi Solid
21	Petrochemical	Organic Sludge, Distilary sludge	Liquid/ Solid/ Semi Solid

2. Process involved in pre-processing Hazardous Waste

2.1 Receipt of Wastes

The Hazardous wastes are transported by M/s GEPIL from the generators to the pre-processing facility in covered trucks and tankers. Three types of wastes are received:

Solid: The solid Hazardous waste arrives in HDPE bags fully covered in order to avoid any spillages and stored in closed storage sheds before sending for processing (Figure 2) .

Figure 2. Solar drying area

Liquid: The Liquid Hazardous waste arrives in tankers, and then pumped into the storage tanks directly before the processing.

Semisolid / Viscous Liquid: The semisolid and viscous liquids Hazardous waste arrives in drums and stored in the closed storage sheds before going for processing.

2.2 Processing facilities:

The unit has two separate sheds for solid / semi-solid handling and Liquid Handling. In shed-I, the solid wastes are blended with liquid and semi-solid wastes to obtain required calorific value and the final output is in solid form (Figure 3). Different wastes are heaped on the floor and blended with JCB to get the final product. Shredding mill and Hammer mill are used for reducing the size of the wastes (Figure 4 and 5). Vibro screens are used for screening of large particles and to maintain the uniformity of solid particles (Figure 6).

Figure 3. Solid Waste Blending area

Figure 4. Shredder

Figure 5. Hammer mill

Figure 6. Vibro screens

The unit is in the process of installing an automated processing system with Compactors, Mixing Pit, Vibro Screens and loading into trucks through Conveyers (Figure 7 and 8).

Figure 7. Proposed automation for solid waste blending - Compactor

Figure 8. Proposed automation for solid waste blending – Conveyer belt

In shed –II, the liquid wastes are stored in barrels and pumped to a Mixing tank of capacity 35 KLD where the mixture is blended for uniform composition. The tank is provided with temperature sensor and cooling coils for removing exothermic heat. The mixed liquid is pumped to storage tank of capacity 25 KLD from where it is dispatched by tankers (Figure 9).

Figure 9. Liquid waste blending area

2.3 Quality Check:

Finger Print Test is carried out for 15 parameters *viz.* pH, moisture content, loss on ignition, ash content, Chloride, Calorific value, Odour, Physical state, Colour, Texture, Water reactive, Total sulphur, Air reactive, Reaction with acid and Reaction with alkali is conducted in the M/s GEPIL lab before taking the consignment. On receipt of the consignment, Quick Check Analysis (Total sulphur moisture, Chloride and Calorific value) is carried out before unloading of the hazardous waste in their premises. Before blending different types of wastes in the shop floor, Compatibility Testing is carried out in the lab. Also, final quality check is carried out before loading the pre-processed product material to cement industries for co-processing.

3. **Environmental Management System:**

- The unit consumes 15KLD of water for domestic and gardening usage. There is no water requirement for industrial process.
- Domestic waste water is treated in septic tank, and soak pit.
- The unit does not generate any effluent from their processes. The leachate from the waste sludge dumped in the Solar Drying Area is absorbed by binding materials like ash, saw-dust and sand which is again re-used in the process.
- Although there is no trade effluent generation, the unit has provided an ETP of 1 KLD capacity to collect and treat any accidental spillages (Figure 10). ETP has following treatment units:
    - Collection Tank ->Flocculation / Coagulation Tank -> Tube Settlers -> Intermediate Collection Tank -> Dual Media Filter -> used for fire fighting purpose.
    - The sewage is mixed with alum and poly in flash mixer which coagulate and the density of particles are increased. Further the water flows through the tube settler where the high density particles settled down and only the supernatant passed through the dual media filter. Dual media filter generally consists of sand-anthracite which removes the turbidity and solids present in the water.

Figure 10. Effluent treatment plant

- Dust Extraction Systems are provided at blending places with hood and suction arrangements connected to bag filters and carbon adsorption system for removal of dust and odour control (Figure 11).

Figure 11. Bag filter and Scrubber System

- Odour Control System has been installed at the entry / exit points of process rooms, in which water and Odour Control Chemicals are sprinkled as fine Mist through sprinklers (Figure 12).

Figure 12. Odour Control System

- VOC sensors are provided in the process area and surrounding area of the plant and are connected to TNPCB and CPCB through Continues Online Emission Monitoring System.
- The unit follows Manifest Systems while collection as well as dispatch of Alternate fuel and keep SPCB informed about each shipment.

4. Recommendations for the facility proposed to M/s. Nikesh Enterprises at Thuthipet, Puducherry:

- The hazardous wastes shall be handled in an environmentally safe manner avoiding the possibilities of contaminating the environment and eliminate the chances of accidents leading to environmental damage.
- The unit shall install covered sheds with impervious flooring.

- Waste shall be stored in storage tanks / containers / bins.
- Bulky wastes shall be handled on impervious lined flooring under shed.
- The unit shall process and despatch the hazardous waste received as quickly as possible and avoid prolonged storage. The maximum storage of Hazardous Wastes shall be restricted to one week's raw material requirement i.e. 350 Tons.
- Fume extraction systems connected to Scrubbers / bag filters / VOC emission control through carbon adsorption shall be provided for fugitive dust and odour control in the shredders, crushers, grinders, etc where there is such emissions.
- Odour Control System shall be installed at the entry / exit points.
- The storage, handling and pre-processing facility shall have appropriate spillage / leachate collection and storage system with impervious liners to avoid contamination of the ground water and soil.
- The storm water and spillage / leachate drainage systems shall be designed that there should be no contamination of the storm water with the spillage or leachate from the storage, handling and pre-processing area.
- The effluent generated during accidental spillages and leachates if any shall be treated in an Effluent Treatment Plant.
- The unit shall follow good housekeeping and safety practices.
- Storm water drainage shall be cleaned regularly and contamination with HW shall be avoided
- The delineation of storage area for raw materials, process area and final product area shall be ensured.
- Storage and Labelling of HW in storage yard shall be followed in comply with Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016.
- The unit shall install adequate safety measures such as Automatic smoke and heat detection system shall be provided in the sheds. A proper fire protection system shall be in place in the storage and pre-processing area.
- The electrical and instrumentation fitting shall be conforming to the standards.
- Emergency showers and eye wash stations shall be provided within the storage, handling and pre-processing work area for immediate emergency use following exposure to the wastes.

- The workers shall be provided with appropriate PPEs like Safety Goggles, Aprons, Gloves, Boots, etc.
- The unit shall scrupulously comply with all the conditions stipulated in the "Guidelines for Pre-Processing and Co-Processing of Hazardous and Other Wastes in Cement Plant as per Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016" published by CPCB.

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