

## **Visit to SWM Plant , Saligao**



**Members of IEI Goa State Centre visited the SWM Plant, Saligao on 11<sup>th</sup> June 2016**

**A team of 32 members from IEI Goa State Center visited the SWM facility operated jointly by Dept. of Science & Technology , GIDC & a private operator SMC Infrastructure.**

**The visit was arranged through good offices of Mr Domnic Fernandes who introduced Mr Ganesh Kandaswami In Charge of operations briefed the IEI Team in the conference room of the facility.**

**The following information was collected (subject to verification by Mr Ganesh) :**

- **The garbage collected on Saligao plateau over last twenty years weighing approximately 70,000WMT had to be processed. This work has been done partly. The technical term is Remediation.**

- A Special Purpose Vehicle (SPV) Hindudstan Waste Treatment was formed and a DBOT route was selected.
  - The CAPEX was Rs 146 Crores.
  - The designed capacity is treating 100Tons Per Day (TPD) in two shifts which operate 7am to 3pm & 3pm to 9pm.
  - The present treatment quality is about 60TPD mostly dry fractions. The feed is from Panchayats in North Goa coastal belt.
  - The plant was started on 19<sup>th</sup> May 2016.
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- ✓ The operation starts at the main gate where incoming segregated MSW is weighted. The Weigh Bridge is connected to Central Data processing Center which keeps records.
  - ✓ The trucks weighed proceed to Receiving Shed. Tipping Floor where the incoming MSW is placed in bunkers. The waste is classified as Dry, Hotel, Mixed.
  - ✓ The receiving shed has three extractor fans of 35HP each for ventilation to remove bad odors. These units have filtration system before the air is discharged into the atmosphere.
  - ✓ Presently 90% waste is received as Mixed Waste.
  - ✓ The MSW is fed to a hopper & conveyor to bag opener unit by a bucket wheel loader.
  - ✓ The MSW then is fed to a roller screen for separating size wise fractions of 60-120 mm and below 60 mm.
  - ✓ The smaller fractions are sent for organic processing.
  - ✓ The bigger fractions are segregated to 19 different types over a manual sorting station where 18 people sort as the waste moves over a conveyor.
  - ✓ The organic fractions are pressed to remove the moisture content. The moisture is called Leachate and is sent to a ETP and the organic matter is stored in a Fermenter for 23 days approximately where it undergoes a Thermophillic process.
  - ✓ The Biodigester produces methane gas from the organic material.
  - ✓ The biogas is used to operate gas engines coupled to Generators to produce about 340KW of power. There are two such units with provision to install a third unit. These Power Generating Sets are housed in a separate room which is acoustically lined. The biogas generated is cleaned of gasses like SOX with a scrubber unit.
  - ✓ The dewatered sludge is kept for maturing for about 14 days before being packed to be sent to M/S. Zuari Agro Chemicals Ltd who are designated by Goa Govt. The GOI by a notification

has mandatory that the fertilizer companies will add 5% of compost generated from Municipal Sewage Waste Plants to their fertilizer mix. So companies like Zuari Agro pick up compost. Every state has designated fertilizer company for this

- ✓ purpose. For example Rashtriya Chemical Fertilizers(RCF) is one such company designated for state of Maharashtra.
- ✓ The fractions that are separated are compacted with bailing machines and the bailed products are taken away by authorized recycler. The fractions are Plastics, PET, glass, Thermocole, coconut husk, cloth, E Waste, tetrapack,
- ✓ Bobcats are used for materials movement in the internal zones
- ✓ Bailing machine is used for packing/wiring of fractions for further collection by vendors.
- ✓ There is a wrapper machine specially for use in Monsoon for compacted waste like husk.
- ✓ Coconut husk is added to Compost in proportion to give a fibrous content.
- ✓ The Plant has its own Effluent Treatment Plant(ETP), Fire Fighting System, In House Laboratory, Guest House, Canteen, Administration Building, Wash Rooms,
- ✓ There are borewells in the premises which are also used to monitor quality of ground water.
- ✓ One Sanitary landfill with capacity for two years is ready.
- ✓ Inerts are less than 10% of incoming.
- ✓ The E waste is segregated from the waste and is collected by agencies approved by Goa State Pollution Control Board(GSPCB)
- ✓ The water requirement for staff, washing etc is now about  $10M^3$  per day excluding water for gardening.
- ✓ Power requirement is about 750KW for plant operations out of which about 650KW is produced in house
- ✓ The total power requirement including auxiliaries will be about 1MW.
- ✓ In case of breakdown, the tipping floor has capacity to hold a 6days incoming waste. Adequate spares are stocked.
- ✓ The total Manpower for plant operations is 40 employees per shift.
- ✓ The plant is not designed to accept / process Biomedical OR Hazardous OR Construction Waste
- ✓ Batteries , Bulbs , Tube lights are separated at receiving.
- ✓ Goa being a consumer of coconut, the coconut shells/husk received are shredded , bailed and disposed. Some such shredded husk is added to the compost

- ✓ Empty Sachets / plastic are converted to Refuse Derived Fuel(RDF).The RDF have a calorific value of about 2500 Kcal. The RDF fetches a rate of Rs 2800/- per Kg depending on Calorific Value.
- ✓ There is no Incineration facility in the plant.
- ✓ The biomedical waste is sent to designated waste treatment units approved by GSPCB.
- ✓ Estimated generation of RDF is about 10-12 TPD.
- ✓ The OPEX is estimated about Rs 2000 / Ton. Recovery from waste is around Rs 500/- and Govt pays tipping charges of about 1500/ ton.
- ✓ There is Monitoring Committee for ensuring quality of operations headed by Dr Kale and experts from NEERI, BITS.

*\*The above notes are compiled by Er Milind D.N.P. Sardesai(MIE) and are property of Institution of Engineers India Goa State Center.*