CENTRAL POLLUTION CONTROL BOARD
Zonal Office (South)
Nisarga Bhavan, Thimmaiah Road
Shivanagar, Bangalore - 560 010

Inspection Report of M/s Karnataka Waste Management Project

Date of inspection: 19/11/2013

a	Name & Address of HWTSDF	M/s Karnataka Waste Management Project (Division of Ramky Enviro Engineers Ltd) KIADB Industrial Estate, Dobbaspet Nelamangala Tq, Bangalore Rural Dist-562 111	
b	Contact person Telephone No. Mobile No. Fax Email	Major (Retd) Dilip Reddy. G.,Project Manager 080-27735400 9663146747 080-27735399 dilipreddy@ramky.com	
c	Month & Year of establishment	June 2008	
d	HWTSDF established by	Ramky Enviro Engineers Ltd, with technical assistance from KSPCB and GTZ	
e	HWTSDF presently operated by	Karnataka Waste Management Project (Ramky Enviro Engineers)	
f	Industry or Industrial location nearby	KIADB, Dobbaspet	
	Total no. of member industries	531	
	Total quantity of H.W generated by member industries as per Authorization in TPA	Landfillable	40000 MT per annum
	Total quantity H.W treated/disposed by the facility		Quantity in TPA
		2010-11	24690
		2011-12	29114
		2012-13	29162
		2013- till date	18722
g	Total area of the TSDF in acres	Total area	93.4 acres
		SLF	25 acres
h	Area of influence (Approx. in KM)	5Km	
i	Capacity of the TSDF	8 lakh MT for 20 years @40,000 MTA	
j	Facilities available with the TSDF in respect of Treatment, storage & disposal	• 5 stabilization bins each 30 MT capacity • 9 Waste hauling vehicles for collection & Transportation of wastes from generators • Earth moving equipments for internal handling &	

<table>
<tr><td></td><td></td><td colspan="3">moving of the waste inside the TSDF
• TSDF laboratory accredited by NABL and empanelled with KSPCB</td></tr>
<tr><td rowspan="5">l</td><td>Source of water for the TSDF</td><td colspan="3">Ground water/ Water is purchased from outside in tankers</td></tr>
<tr><td>Level of ground water in and around the disposal facility</td><td colspan="3">>60m</td></tr>
<tr><td rowspan="4">Rivers/ Lakes/ Canals in & around the TSDF with approximate distance from TSDF</td><td>1</td><td>Mannekera Tank</td><td>Located to the North west at about 3 KM from site</td></tr>
<tr><td>2</td><td>Hirekere Tank</td><td>Located to the East at about 4 KM from the site</td></tr>
<tr><td>3</td><td>Kodihalli Tank</td><td>Located to the Southeast at about 5KM</td></tr>
<tr><td>4</td><td>Twin Tanks</td><td>Located near NH-4 to the southeast at about 5.5 KM from the site</td></tr>
<tr><td rowspan="4">m</td><td rowspan="4">Transportation
No. of vehicles (existing/ proposed) (own/ hired)</td><td colspan="3">The facility owns 9 vehicles</td></tr>
<tr><td colspan="2">Type</td><td>Number</td><td>capacity</td></tr>
<tr><td colspan="2">Tippers</td><td>5</td><td>10MT</td></tr>
<tr><td colspan="2">Container carry vehicles</td><td>4</td><td>5 MT</td></tr>
<tr><td>n</td><td>Total population in & around the disposal facility up to radius of 15 km</td><td colspan="3">Around 1 Lakh</td></tr>
<tr><td>O</td><td>Total no. of industries up to radius of 15 km</td><td colspan="3">50 industries</td></tr>
<tr><td colspan="2">Waste acceptance criteria followed</td><td colspan="3">Hazardous waste Rules-2008 (Management, Handling and Transbounday Movement) & associated CPCB guidelines</td></tr>
<tr><td colspan="2">Time in hrs required for finger-print analysis for parameters</td><td colspan="3">Minimum 3 hrs</td></tr>
<tr><td colspan="2">Whether W/w generated from cleaning of vehicles is treated before disposal</td><td colspan="3">The wastewater generated from cleaning of vehicles is taken to solar evaporation pond</td></tr>
<tr><td colspan="2" rowspan="4">Storage Area</td><td colspan="2">Temporary storage</td><td>1202.32 sq.m</td></tr>
<tr><td colspan="2">Intractable storage</td><td>696.13 sq.m</td></tr>
<tr><td colspan="2">Shredder cum container store</td><td>408.83 sq.m</td></tr>
<tr><td colspan="2">Container storage building</td><td>320.25 sq.m</td></tr>
<tr><td colspan="2">Leachate collection and transportation provision made at the temporary storage area</td><td colspan="3">Leachate generated from storage area is pumped into stabilization pits and leachate is used for stabilization</td></tr>
<tr><td colspan="2">Safety provisions made at the temporary storage area</td><td colspan="3">Fire extinguishers are placed around the sheds and also drains are laid around the shed which lead to leachate pond.
The facility is handling different types of hazardous landfillable wastes and during monsoon the wastes are stored upto a period of 90 days. Inspite of this,</td></tr>
</table>

	the sheds are not equipped with water sprinkling system/ auto fire diffuse system.	
Facilities provided for pre-treatment	The wastes are stabilized manually using wheel loaders. Stabilization is done by either combining similar compatible wastes from other industries in the vicinity or by the addition of stabilization agents like cement, flyash and lime. Leachate from storage sheds and solar evaporation pond is used for stabilization.	
List of Chemicals/stabilizing agents proposed to be used in the treatment processes	Chemical	consumption, Oct-2013
	Lime	20MT
	Cement	17MT
	Fly ash	230 MT
	Sulphuric acid	-
	Ferrous sulphate	-
Arrangements for storage of chemicals/stabilizing agents	Stored at chemical storage house	
No. of cells in TSDF as per the designs approved by SPCB/PCC	21 cells in 5 phases as per GTZ and KSPCB design. No. of cells in each phase Currently, cells 1 & 2 are in operation.	
Proposed landfill capacity in Tons	8 lakh MT for 20 years @ 40,000 MTA	
No. of cells completely filled with HW so far with total quantity of HW disposed (Cell wise)	phase-I Cell-1: 75761 MT Cell-2: 68502 MT Cell-3: Under Construction Cell-1 & 2 are still in operation.	
Mode of transportation of treated hazardous waste up to the disposal facility	Dedicated vehicles (Tippers) are provided for transporting H.W from stabilization pits to cells	
No. of Monitoring wells around TSDF	Two wells inside the facility and 9 monitoring wells outside the facility	
Leachate generation per annum in KL	360KL per month	
Leachate collection system	Leachate from SLF flows under gravity to Solar Evaporation pond of capacity 4000 KL which is lined with HDPE.	
Provision for collection of leachate/drainage provision		
Provision made for removal of leachate from leachate collection pits	Leachate generated from sheds is collected in sump tanks provided near each storage shed which is then pumped to the stabilization pits. Excess leachate in sump tanks is taken to SEP through tankers. HDPE lined pipes are also provided to transfer leachate from SEP to stabilization pits.	
Provision for transportation of leachate to the treatment facility		
Whether any provision made for covering the facility so as to avoid entry of rainwater during monsoon	During monsoon, the cells are first covered with 1.0mm HDPE liners and then with tarpaulin to prevent entry of rain water	
Leachate treatment (by MEE/ solar evaporator/ steam stripping/ etc) and final disposal	Currently, the facility has not provided any treatment facility. Leachate is evaporated in SEP	

Monitoring		Frequency of monitoring	
		by Facility	By PCB/ outside party
Ambient air quality monitoring		weekly twice	yearly
Soil monitoring		Quarterly	yearly
Ground water monitoring		Monthly	Quarterly
Hazardous Waste Management Status			
H.W generated	Quantity generated	**Hw storage & Disposal facility**	
Used oil	1.5 KL/A	Collected in leak proof containers and sold to KSPCB authorized M/s Arun industries.	
oil containing cotton waste	0.5 MT/A	The wastes are stored in hazardous waste store but till date the wastes are not disposed.	
Used lead acid batteries	10 No.s/A		
Empty containers contaminated with hazardous waste	1000 No.s/A		

Observations:

1. M/s Karnataka Waste Management Project-Division of Ramky Enviro Engineers Ltd (TSDF) is an Engineered Landfill associated environment treatment facilities like Solar evaporation pond located at Dobbaspet, Nelamangala Tq, Bangalore Rural Dist-562111.
2. The facility was inspected on November 17, 2013 by Smt. Mahima T, Scientist-"B" under the project "Monitoring of Treatment, storage and Disposal Facilities in Southern Zone".
3. The TSDF was established by Government of Karnataka with technical assistance from German Technical Co-operation under Design, Build, Own, Operate and Transfer DBOO(T)- basis. The TSDF is operated by M/s Ramky Enviro Engineers Ltd, for which the Department of Forest, Ecology & Environment (DFEE), Government of Karnataka has allocated 94 acres of land at Dobbaspete, Bangalore rural District on long lease for a period of 51 years for 1 year of construction, approximately 20 yrs of operation and 30 years of post-closure period.
4. The TSDF is located at longitude of $13^0 13^l 34.20^{ll}$ N and $77^0 15^l 22.7^{ll}$ E about 48 km Northwest of Bangalore city located adjacent to KIADB industrial estate bounded by National Highway – NH 207 in the North, a nallah in the east, TDPS factory and service road leading to National Highway NH-4 in the south and agricultural land in the west. As per the HAWA-GTZ guidelines, the facility has only single composite landfill liner system. The schematic diagram of landfill is placed in **Figure 1**.
5. This facility is constructed & operated as per GTZ guidelines and is different from other TSDF facilities in India. This facility has constructed single composite liner system unlike other facilities having dual liner system. In other facilities, capping is done after each cell is completely filled but in this facility capping is done only after all cells in each phase are completely filled.
6. The ground water table in the site is below 60 m as against the CPCB requirement of minimum 2m. The field permeability value of soil in the area is 2.5 x 10-7 m/s to 2.5 x 10-8 m/s. The site has a natural gradient of 2.2%, which is being used to collect the leachate under gravity in the laechate pond.
7. Though the combined Consent Order under the Water Act, 1974 and the Air Act, 1981 has expired on June 30, 2013 but however the unit has applied for renewal of Consent. The facility has Hazardous Waste Authorization for treatment and disposal of 40,000 MT/ annum of hazardous waste valid till 30.06.2018. (**Annexure-I**)

S.N	Condition	Complying/Not complying	Remarks
1	The facility shall install MEE for disposing the leachate generated from the waste within six months	Not complying	Reported, the facility has proposed to install hazardous waste incinerator within eight months and thereby the leachate shall be consumed in spray drier
2	The facility shall install Hood ducting and air pollution control equipment with chimney to the waste stabilization/ processing area to control odour/ smell nuisance to the surrounding environment	Partially-complying	Installation under progress
3	The facility shall not store the hazardous wastes more than ninety days as per Rule 7 (1)	Partially-complying	Though, it was reported that they are complying but it was observed that certain hazardous wastes are stored in the premises since July, 2013

8. The TSDF provides two services: Direct landfilling and landfilling after treatment. The HW vehicle carrying the waste is first weighed at the weigh bridge and then sample of the waste is collected at the sampling bay for chemical examination (finger print analysis) so as to match with the declared waste. If the HW is found conforming to the norms, the waste is accepted by the facility or else is sent back to the generator. If the waste complies with the waste acceptance criteria, it will be sent for either stabilization or direct landfilling as per the requirement. After appropriate treatment like drying, stabilization (cement, flyash and or lime), shredding, it will be landfilled. The treated HW is placed in different cells in each phase in the landfill. The flow diagram of H.W flow is placed in **Fig-2**.
9. The facility practices manual stabilization using wheel loaders. Stabilization is done by either combining similar compatible wastes from other industries in the vicinity or by the addition of stabilization agents like cement, flyash and lime using leachate. The facility has to carry out leachability tests and assess whether the stabilization process using leachate conforms to the norms.
10. After stabilization, the waste is transferred from stabilization pits to the cells using dedicated vehicles. Currently, cells 1 & 2 under phase-I are under operation.
11. Reported that due to onset of monsoon, since July, 2013 both the cells are covered with 1.0mm thick HDPE sheets and tarpaulins to prevent entry of rain water. The wastes after adequate treatment are stored in the temporary sheds and as & when the rain subsides the wastes are transferred to cells.
12. On the day of inspection, out of the 5 stabilization bins, three bins were filled with waste and two with leachate (**fig 3**). Stabilized waste and direct landfillable wastes were stored in different sheds **Fig 4**. The cells were completely covered (**Fig 5**). Out of the total quantity of wastes arriving at the facility, more than 85% of the waste requires treatment and only about 15% of the waste is subjected to direct landfilling.
13. The facility has not provided any flow meters to quantify the amount of leachate

generated. But however it was reported that around 12KLD is generated (from both cells and storage sheds) out of which 7KLD is used for stabilization and remaining 5KLD is taken to SEP of capacity 4000KL.

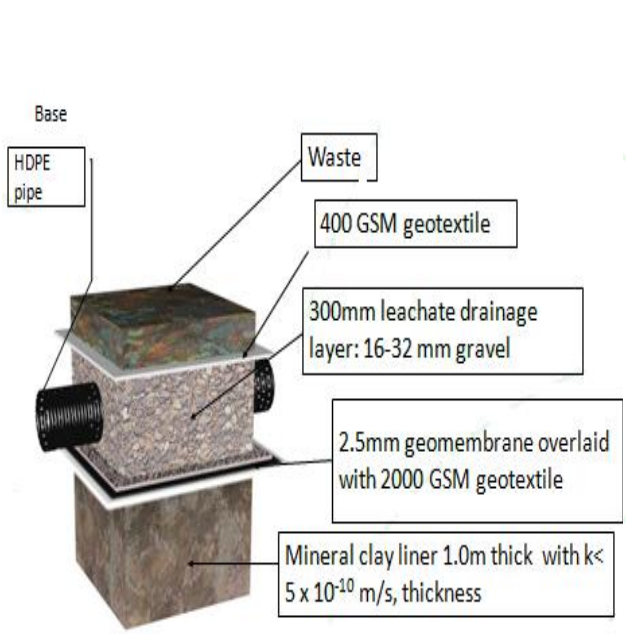
14. On the day of inspection, the solar evaporation pond was covered with HDPE sheets to prevent the entry of rain water **Fig 6**. The facility has not provided any treatment facility for treating leachate and is currently evaporated in SEP. Though KSPCB has directed the facility to install MEE for treating leachate, but the facility has proposed to install hazardous waste incinerator and thereby the leachate shall be consumed in spray drier.
15. As this is the only TSDF facility in Karnataka, hazardous wastes from all industries existing in Karnataka are disposed in this facility. Hence, this facility should be under strict vigilance.

Recommendations: The TSDF facility shall be directed to comply to the following:

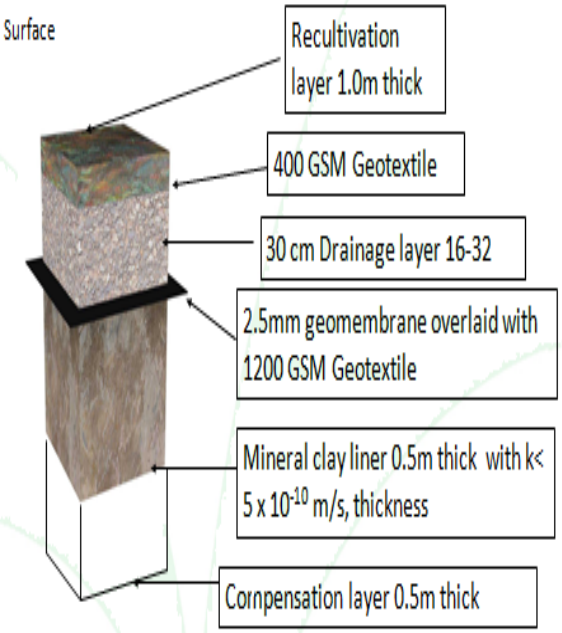
- CPCB & KSPCB shall carry out joint inspection of the facility once in a year for compliance verification.
- The facility shall either obtain valid consents for utilizing leachate for stabilization of wastes or shall immediately take entire leachate generated to the treatment facility
- The facility shall provide flow meters to quantify the amount of leachate generated.
- The facility shall immediately dispose the hazardous wastes generated from the plant activities as per the Authorization
- The facility shall provide suction hood and chimney with appropriate air pollution control equipment in the waste stabilization area.

Date of Inspection	November 19, 2013
Name & designation of inspecting officers	1. Smt Mahima T, Scientist-"B"
Signature of Officials **Mahima T** **Scientist-"B"**	**Dr. K. Ranganathan** **Scientist-"C"**
Zonal Officer's name Signature	**S. Suresh** **Zonal Officer**

PHOTOS



Landfill Single composite liner system



Landfill Cover System

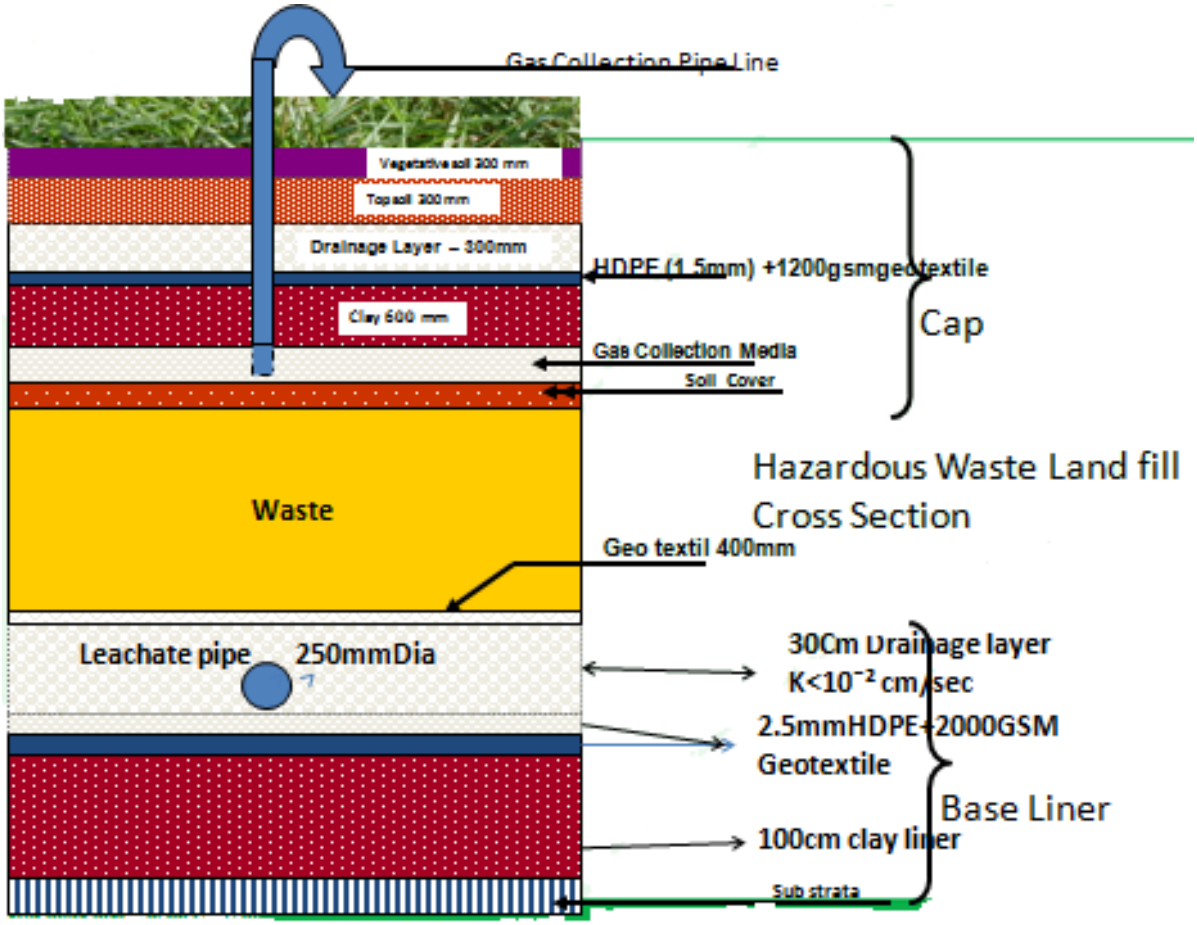


Fig 1: Landfill Liner system

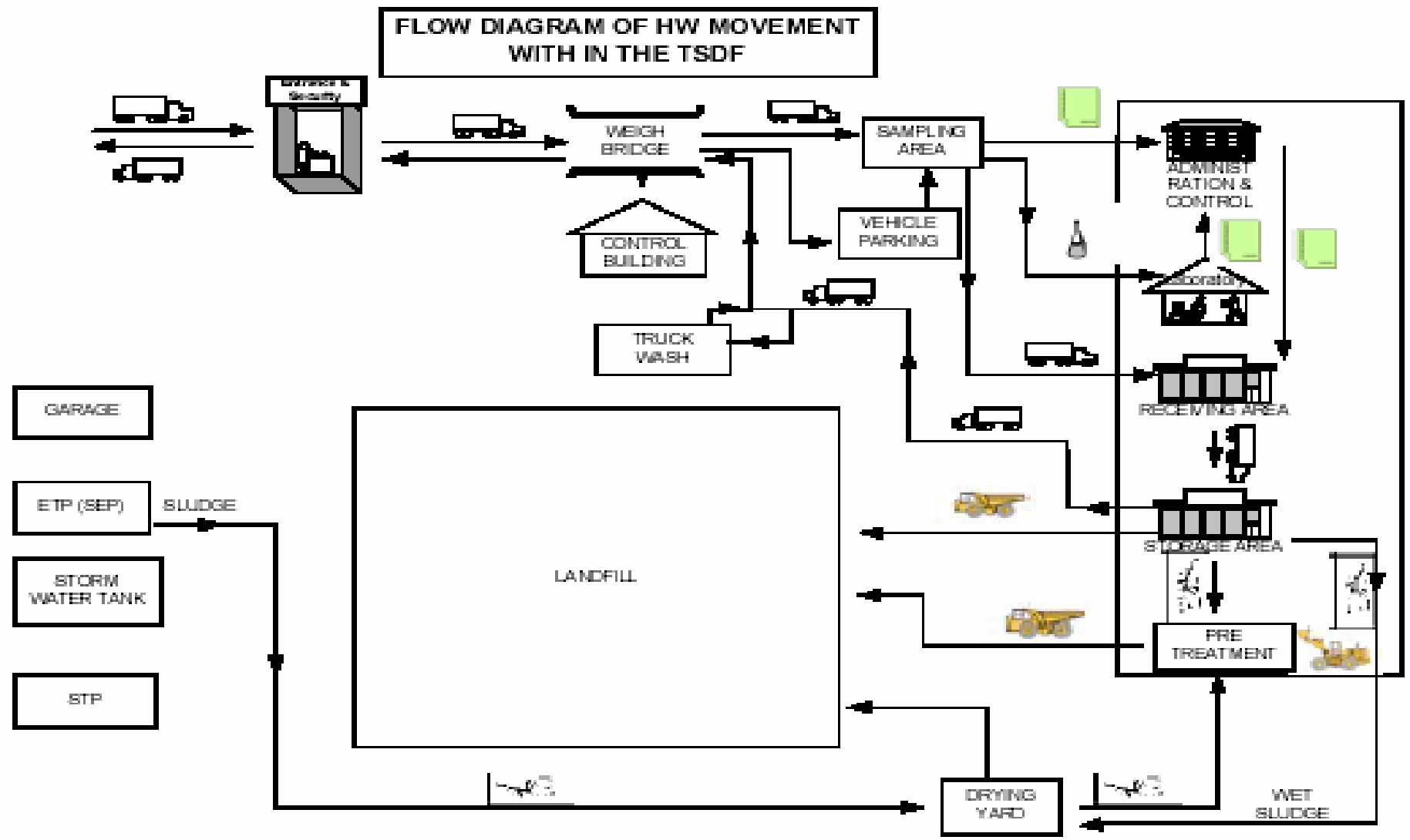


Fig 2: Flow diagram of HW movement in TSDF

Fig 3: Waste stabilization pits

Fig 4: Waste storage sheds

Fig 5: Cells covered with tarpaulins

Fig 6: Solar Evaporation Pond