



**FOLLOW-UP INSPECTION REPORT
Of CBMWTF**

**M/s Shushrutha Bio Medical Waste Management
Society, Shimoga, Karnataka**

**South Zonal
Office
Bangalore**

Date of Re-inspection : June 26, 2014

Background

M/s Shushrutha Bio- Medical Waste Management Society, Sy. No. 31/C, Machenahalli Industrial Area, Shimoga, was inspected and monitored by CPCB on December 08, 2011 whereby violation of the provisions of the BMW Rules were observed and accordingly show - cause directions under Section 5 of the EP Act, 1986 issued to the facility on February 21, 2012 for time bound action and bank guarantee of Rs. 10 Lacs. Latter, which was followed with Directions under Section 5 of EPA 1986 on May 15, 2013.

In this regard, In-charge HWM Division requested vide letter dated March 28, 2014, to verify the compliance status of CPCB's Directions and submit the joint inspection report for initiating further action in the matter.

Joint inspection and monitoring of the facility was conducted by CPCB and KSPCB officials on **June 26, 2014** to verify the compliance of the directions. The joint inspection was carried out by the following officials:

1. Mr. G.Thirumurthy, EE, CPCB
2. Mr. Deepesh. V, SSA, CPCB
3. Mr. Seenival Raj, JLA, CPCB, and
4. Mr. R.Gurumurthy, EO, KSPCB
5. Mr. S.C.Suresh, DEO, KSPCB

On the day of inspection the bio medical treatment facility was in operation. The compliance of the directions issued u/s 5 of E(P)A and other observations are as follows:

01.	Name of the Facility	:	M/s Shushrutha Bio Medical waste Management Society, Plot no.31/c, Machenahalli, Industrial Area, Shimoga District, Karnataka.
02.	Name of Contact person	:	Dr. H. R. Narendra, President Tel. : 08182-246090 E. Mail.: shushruthasmg@gmail.com
03.	Year of Establishment	:	2004
04.	CBMWTF set up & operated by	:	M/s Shushrutha Bio Medical waste Management Society
05.	Installed Capacity	:	<ul style="list-style-type: none">➤ Incinerators 100 kg/hr. and 50 kg /hr.(Stand by)➤ Capacity of Autoclave: 430 lit/batch.➤ DG set : 30 KVA
06.	Status of consents & Authorization (validity)	:	KSPCB issued consent under Water Act & Air Act, which is valid up to 30.6.2014.

07.	Bio Medical waste Authorization (Validity)	: Authorisation for operating a facility, collection, reception, treatment, storage, transport and disposal of Bio medical waste has validity up to 30.6.2014, issued on 17.11. 2011 by KSPCB for a period of 3 years from 1.7.2011.																													
08.	Total Number of Health Care Facility and Bed Covered: HCE : 640 Beds : 3815																														
09.	<p>Effluent Treatment facilities provided,& Disposal Details:</p> <p>The scrubbing effluent, vehicle washing and floor washing wastewater are routed by a closed conduit to reach equalisation tank through baffles. The overflow from the equalisation tank is allowed to pass to the next tank for holding the water (intermediate tank) and pumped to pass through sand and activated carbon filter. The filtered water is collected in a tank and utilised for gardening. The solid deposits (sludge) if any from the equalisation tank and intermediate tank is removed manually and stored in a sludge drying bed. There is no chemical dosing mechanism for maintain the pH at the scrubber tank as well as at equalisation tank.</p> <p>The inspection team collected the treated effluent (Grab) sample after activated carbon filter to verify the compliance of the discharge standard. The analysis results are as follows:</p> <p style="text-align: center;">Analysis Result of Treated Wastewater</p> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Parameters</th> <th>Unit</th> <th>KSPCB Standard</th> <th>Grab</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>pH</td> <td>-</td> <td>6.5 to 9</td> <td>4.0</td> </tr> <tr> <td>2.</td> <td>SS</td> <td>mg/l</td> <td>100</td> <td>2</td> </tr> <tr> <td>3.</td> <td>COD</td> <td>mg/l</td> <td>250</td> <td>12</td> </tr> <tr> <td>4.</td> <td>BOD</td> <td>mg/l</td> <td>30</td> <td>-</td> </tr> </tbody> </table> <p><i>The treated effluent with respect to all parameters is meeting the standard of KSPCB, <u>except pH.</u></i></p>		S. No.	Parameters	Unit	KSPCB Standard	Grab	1.	pH	-	6.5 to 9	4.0	2.	SS	mg/l	100	2	3.	COD	mg/l	250	12	4.	BOD	mg/l	30	-				
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10.	<p>Stack Details & Source of Emission :</p> <p>The inspection team conducted source emission monitoring for 100kg/hr. incinerator. The monitoring results of the same as follows:</p> <p style="text-align: center;">Source Emission Monitoring Results</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Details</th> <th>Incinerator Stack</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Date of Monitoring</td> <td>13.02.2014</td> </tr> <tr> <td>2.</td> <td>Fuel used</td> <td>Diesel</td> </tr> <tr> <td>3.</td> <td>Pollution Control Devices attached</td> <td>Venturi Scrubber</td> </tr> <tr> <td>4.</td> <td>Temperature (°K)</td> <td>365</td> </tr> <tr> <td>5.</td> <td>Stack Diameter (M)</td> <td>0.4</td> </tr> <tr> <td>6.</td> <td>Height (M)</td> <td>33</td> </tr> <tr> <td>7.</td> <td>P.M. Emission Standard (mg/Nm³)</td> <td>150*</td> </tr> <tr> <td rowspan="2">8.</td> <td><i>Monitoring Results (Mg/Nm³)</i></td> <td></td> </tr> <tr> <td>Particulate Matter</td> <td>1043</td> </tr> </tbody> </table> <p>Note : * - Normalised to 12% CO₂ Correction</p>		Sl. No.	Details	Incinerator Stack	1.	Date of Monitoring	13.02.2014	2.	Fuel used	Diesel	3.	Pollution Control Devices attached	Venturi Scrubber	4.	Temperature (°K)	365	5.	Stack Diameter (M)	0.4	6.	Height (M)	33	7.	P.M. Emission Standard (mg/Nm ³)	150*	8.	<i>Monitoring Results (Mg/Nm³)</i>		Particulate Matter	1043
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	<p><i>The unit is not meeting the emission standard prescribed by KSPCB for Particulate Matter i.e. 150 mg/Nm³.</i></p> <ul style="list-style-type: none"> Relevant photographs are attached as Annexure 1. 		
11	<p>Status of Compliance of Directions issued under Section 5 of EPA, 1986</p>		
	<p>S. No.</p>	<p>Directions</p>	<p>Status of Compliance of Directions</p>
	<p>a)</p>	<p>To complete installation of new incinerator & autoclave with all necessary provisions as per BMW Rules as well as CPCB guidelines.</p>	<ul style="list-style-type: none"> The unit has installed new incinerator with a capacity of 100 kg/hr. with a venture scrubber followed with stack (Common). The unit has installed autoclave of 430 lit. Capacity. Hence the direction is complied.
	<p>b)</p>	<p>To submit 'no objection certificate (NOC)' obtained from KSPCB for installation of new equipment including incinerator, upon receipt of the same from KSPCB.</p>	<ul style="list-style-type: none"> The Karnataka State Pollution Control Board has issued Consent For Establishment for expansion of installation of incinerator capacity of 100 kg/hr and new autoclave vide lr. PCB/CEO-2/EO/F-72/BMW/2012-13/306 dated May 27, 2013. Subsequently Consent to Operate also issued by KSPCB on July 2, 2013. Hence the direction is complied.
	<p>c)</p>	<p>To complete rectification of the existing incinerator to ensure provision for adequate negative draft in the primary chamber to control fugitive emission as per CPCB guidelines and operation of the existing treatment equipment in accordance with the provisions if BMW Rules with immediate effect in case it is to be used, otherwise the system shall be dismantled and removed from the site immediately;</p>	<ul style="list-style-type: none"> The existing incinerator of 50 kg/hr. is retrofitted with APCD and connected to a common stack. The existing incinerator is kept as standby also incorporated in the consent conditions as a standby unit. Hence the direction is complied.
	<p>d)</p>	<p>To complete installation of automatic recording of the operational parameters of the incinerator and tamperproof PLC based control system with the existing incinerator as per CPCB guidelines.</p>	<ul style="list-style-type: none"> The unit has installed PLC system for the operation of the incinerator and to record the operational parameters, which was found non- functional. <i>The unit shall be directed to rectify the Process automation and data acquisition system</i>

		<i>immediately. Hence the direction is not complied.</i>
e)	To complete installation of conveyer or automatic feeding device for charging the bio-medical waste into the existing incinerator as per BMW Rules as well CPCB guidelines.	<ul style="list-style-type: none"> The unit has installed (semi-automatic) a conveyer system to charge the bio medical waste into the primary combustion chamber. However, during the day of inspection, the motor of the conveyer system was not working and charging was done manually. Hence the direction is not fully complied. <i>The unit shall be directed to rectify the motor and the conveyer shall be used for BMW charging. The unit may explore the possibility of auto feeding with top loading and double flab sluice gate to avoid fugitive emission during charging.</i>
f)	To complete installation measuring devices for measuring negative draft in primary chamber, air flow rate in the incinerator chambers and pressure drop across venturi scrubber with the existing incinerator.	<ul style="list-style-type: none"> No pressure gauge or U- tube manometer to measure the pressure drop across the venturi scrubber, primary combustion chamber. Temperature measurement is provided to measure the temperature at primary and secondary combustion chamber. Hence the direction is not fully complied. On the day of inspection, the secondary combustion chamber burner was not working and secondary temperature not attained as per norms. <i>The unit shall be directed to install measuring devices for air flow and pressure drop measurement and also to rectify the burner immediately.</i>
g)	To complete installation of venturi scrubber with mist collector with the existing incinerator as per CPCB guidelines.	<ul style="list-style-type: none"> The unit has installed the venture scrubber for the existing and new incinerator; however mist collector is not supplied / provided along with scrubber. Hence the direction is not fully

		<p>complied.</p> <ul style="list-style-type: none"> • <i>The unit shall be directed to install a mist collector after venturi scrubber to eliminate the mist at the stack.</i> • <i>The unit not aware the importance of the pH correction of the scrubber tank, and the scrubber tank was leaking from the bottom.</i>
h)	To procure & install a flue gas analyzer for regular monitoring of CO, O2 & CO2 level in the stack gases during incinerator operation & the records maintained as per CPCB guidelines and submitted to CPCB & KSPCB periodically;	<ul style="list-style-type: none"> • The unit has procured flue gas analyser for monitoring of the stack emission during incineration operation. However, the unit is not regularly monitoring and maintaining records for verifications. Hence, the direction is partially complied. • <i>The unit shall be directed to do the measurement of flue gas at a regular interval during incineration operation and keep the record for verification accordingly. Also the time for regular interval measurement may be clarified for monitoring.</i>
i)	To complete stack emission monitoring provision (such as proper platform, ladder & porthole) as per Emission Regulations, Part-3.	<ul style="list-style-type: none"> • The unit has provided ladder, platform and port hole for stack emission monitoring. Hence, the direction is complied.
j)	To complete the provision for mechanical feeding system & installation of automatic recording system for the existing autoclave for recording operational parameters such as batch number, temperature, pressure, start and end of sterilization of the autoclave as per provision of the BMW Rules as well as CPCB guidelines and ensure for its operation & maintenance of records in accordance with the provisions of BMW Rules;	<ul style="list-style-type: none"> • The unit has provided the mechanical feeding system for autoclave and temperature chart is provided to record the operating temperature. However, the unit is not maintaining the batch number for each batch, and the same is not incorporated in the temperature chart too. Hence, the direction is not fully complied. • <i>The unit shall be directed to provide batch number for each batch and maintain the records accordingly for verification.</i>

k)	To conduct strip test for every batch of the waste treated by autoclave in accordance with the BMW Rules to assess efficacy of the existing autoclave & daily records shall be maintained, with immediate effect;	<ul style="list-style-type: none"> • The unit is equipped with to conduct strip test, however the same is not followed for every batch of waste treated by autoclave. Hence the direction is not complied. • <i>The unit shall be directed to conduct strip test for every batch and maintain the records.</i>
l)	To complete augmentation of the existing Effluent Treatment Plant & ensure proper operation & maintenance of the ETP & the records maintained as per CPCB guidelines and submitted to CPCB & KSPCB periodically;	<ul style="list-style-type: none"> • The unit has ETP to collect and treat the effluent from autoclaving, vehicle washing and scrubber effluent, floor washing etc. The ETP consists of collection tank, equalisation and intermediate tank to feed the water to Sand filter and activated carbon filter. The treated effluent is collected in a tank and used for gardening inside the premises. • The ETP is not properly operated; pH correction is not properly done at equalisation tank, which needs attention. Hence the direction is not fully complied.] • <i>The unit shall be directed to install lime dosing system.</i>
m)	To complete construction of ETP sludge drying bed for drying of sludge generated from ETP	<ul style="list-style-type: none"> • The unit has provided sludge drying bed for ETP sludge. Hence the direction is complied.
n)	To stop dumping of plastic, gloves and syringes segregated from untreated bio-medical waste in an open unlined pit with immediate effect & shall make provision for storage of treated sharps & dried ETP sludge prior to its final disposal, & ensure disposal of the dried ETP sludge through TSDF located in Karnataka.	<ul style="list-style-type: none"> • The unit has stopped dumping of plastic gloves, syringes segregated from BMW in an open unlined pit and developed a pit for storage of treated sharps and room is provided for the storage of incinerator ash. Hence the direction is complied. • <i>The unit shall be directed to become member of TSDF to dispose of ETP Sludge accumulated immediately.</i>
o)	To ensure treatment & disposal of bio-medical waste collected from	<ul style="list-style-type: none"> • The unit is equipped to dispose of the bio medical waste collected

	member HCFs within 48 hours of its generation, in accordance with the provisions of the BMW Rules with immediate effect;	from Member HCF's within 48 hours of its generation. On the day of inspection, there was no accumulated waste noticed. Hence the direction is complied.
p)	To stop segregation of untreated bio-medical waste within the facility with immediate effect and shall ensure that the bio-medical waste is segregated at the HCFs in accordance with the BMW Rules;	<ul style="list-style-type: none"> The unit has constituted inspection team comprising three to inspect the HCF to segregate the waste at source and to stop unsegregated waste to come to the facility. However, still there is small quantity of unsegregated waste to keep coming to the facility and noticed at the site in a separate room. KSPCB has given instruction to the facility that to intimate the HCFs which are not segregating at the source and do the proper segregation. Hence the direction is complied.
q)	To ensure disposal of plastic wastes only after treatment by autoclaving followed by shredding through a plastic waste recycler authorized.	<ul style="list-style-type: none"> The unit is disposing plastic wastes after treatment followed by shredding through KSPCB authorised plastic recycler i.e. M/s Yarab Plastic, Bangalore. Hence the direction is complied.
r)	To maintain the records pertaining to operation of treatment equipment, handling of bio-medical waste, its disposal as well as training given to the member HCFs.	<ul style="list-style-type: none"> The unit is not maintaining the records of operation and maintenance of equipment's, but the day wise bio medical waste received and its disposal are kept. Also the training records of the member HCFs, their staff etc. hence the direction is not fully complied. <i>The unit shall be directed to maintain the operation and maintenance of the equipment, and to organise the training to HCF and staff regularly.</i>
s)	To complete construction of demarcated platform as per CPCB guidelines for washing of vehicle/ containers used for handling & transportation of bio-medical waste;	<ul style="list-style-type: none"> The unit has demarcated the platform for washing of vehicle/ containers etc. Hence the direction is complied.

	t)	That the unit shall organize training programmes periodically for all the workers engaged in the facility on aspects relating to handling of bio-medical waste & carry out awareness campaign for the member Healthcare Facilities on regular basis & records maintained;	<ul style="list-style-type: none"> The unit has organised a training programme to the HCFs and their staffs (field and plant). However the same shall be conducted at regularly to make them more aware. Hence the direction may be considered as complied.
12	Recommendations:		
	<p>Based on the inspection and observations, compliance of environmental standards with respect to effluent & emission and the compliance of the Directions issued under Section 5 of EPA, it is recommended that:</p> <ol style="list-style-type: none"> To rectify the deviation observed and to complying the Directions issued under Section 5 of EPA immediately, as recommended above against said directions. To dispose of accumulated incineration ash in municipal landfill. To provide and maintain the records of the safety gloves, shoes, uniform etc. to the waste management staff, drivers and others, if appropriate. To conduct regular health check -up of waste management staff and maintain the records for verification. To appoint a diploma holder in Mechanical Engineering and Environmental Science background person for smooth O & M of incinerators, scrubbers, ETP, etc. To obtain authorisation for Vehicle (Maruti Omini- KA 14 A- 4088) from KSPCB, engaged in collection and transporting of Bio Medical Waste. To dispose accumulated discarded medicines (category 5) waste in a facility by Incineration / destruction and disposal in secured landfills. To display the consent conditions and authorisation at the entrance of the Gate. To arrest the leakage from scrubber bottom tank and also to maintain scrubbing solution in alkaline to neutralise the HCL emission. 		
13	Date of Inspection	:	June 26, 2014
14	Inspection Team	:	<ol style="list-style-type: none"> Mr. G.Thirumurthy, EE, CPCB Mr. Deepesh. V, SSA, CPCB Mr. Seenival Raj, JLA, CPCB, Mr. R.Gurumurthy, EO, KSPCB Mr. S.C.Suresh, DEO, KSPCB
			(G.Thirumurthy) EE, CPCB

15	<p>Action Recommended:</p> <p>The inspection team has observed and confirmed that directions issued by CPCB have been partially complied. In view of the deviation observed in the compliance of the direction, the unit shall be directed to take appropriate action to comply the direction immediately. Also, the unit shall be asked to look into other recommendations as noted and instruct them to submit time bound action plant to comply with all other remaining points. In the meantime KSPCB shall be asked to keep a strict vigil on the unit to observe the compliance to all consent conditions at all point of time.</p>	
	<p>Recommending officers name, Designation and signature</p>	<p style="text-align: center;">(S. Suresh) Zonal Officer</p>

Photographs of M/s Shushrutha Bio- Medical Waste Management Society, Shimoga



Fig.1: Incinerator of 100 kg/hr. in operation.



Fig.2: Operating parameter indicator, Secondary temperature showing only 863°C against 1050°C.



Fig.3: Incinerator of 50 kg/hr. with APCD, ID connected to common stack..



Fig.4: Scrubber connected to 100 kg/hr. incinerator & No mist collector attached



Fig.5: Autoclave of 430 lit. Capacity in operation.



Fig.6: Process automation and data acquisition system under repair



Fig.7: Conveyor system developed for charging is under repair and manually charged.



Fig.8: No pressure gauge or u- tube manometer to measure the pressure drop across the venturi



Fig.9: Negative draft is not maintained at primary combustion chamber, emission during charging.



Fig.10: Ashes are packed in gunny bags and stored in a room for disposal.

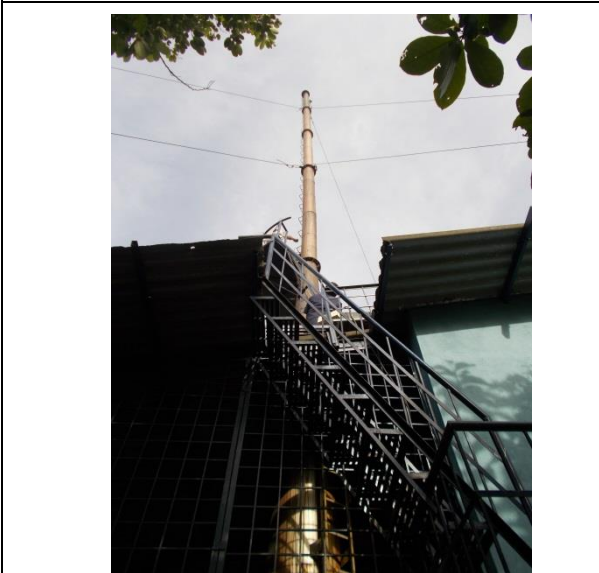


Fig.11: stair case, platform and port hole provided for stack monitoring



Fig.12: strip test arrangement for autoclaving of wastes. One round test conducted.



Fig.13: ETP set – up



Fig.14: Sand filter and activated carbon filter installation at ETP.



Fig.15: Autoclave temperature recording chart, where batch number, date are not mentioned.



Fig.16: shredder installed and found in operation.



Fig.17: sample collected in presence of industry representative.



Fig.18: wastes unloaded from the vehicle at the unit.

F. Tech/45/BMW(KA)/ZOB/2014-15/

July 17, 2014

To

The Member Secretary
Central Pollution Control Board
Parivesh Bhawan
East Arjun Nagar
Delhi-110 032

Sub: Follow- up inspection of M/s Shushrutha Bio - Medical Waste Management Society, Shimoga, Karnataka

Ref.: CPCB Ir. B-31011(BMW)/30/93/2014/HWMD/12448 dt.28.3.2014

Sir,

With reference to the above subject, M/s Shushrutha Bio - Medical Waste Management Society, Shimoga was inspected to verify the compliance status of CPCB's directions issued on May 15, 2012. The inspection team has observed and confirmed that the directions issued by CPCB has not been complied / partially complied. In view of that the unit shall be directed to take appropriate action to comply the direction and recommendations immediately

The inspection report of the same is submitted for kind perusal.

Yours faithfully,

Encl.: As above

(S. Suresh)
Zonal Officer