EXECUTIVE SUMMARY

(English)

for

PROPOSED COMMON BIO MEDICAL WASTE TREATMENT FACILITY

with Induction Pyrolysis (Incinerator) capacity of 200 Kg/hr, Autoclave capacity of 200 Kg/Batch &

Shredder capacity of 100 Kg/hr

at

V.M. Techno-Soft Pvt. Ltd.

Khasra 12/2, Halka Number 19, Village Kokodi, Tehsil - Kondagaon, District – Kondagaon, Chhattisgarh.

As per 7(da) of Schedule to EIA Notification dated 14th September, 2006 Category B

EIA Consultant

ENPRO Enviro Tech and Engineers Pvt. Ltd.

(QCI-NABET Accreditation vide Certificate No. NABET/EIA/1619/SA 044 valid till 10th July, 2019)

306, Royal Park, Adajan Road, Surat - 395 009, Gujarat, INDIA

Ph.: +91-261-27896130, Fax: +91-261-2786129

e-mail: enpro.eia@gmail.com, rushabhmevawala@enpro.co.in

EXECUTIVE SUMMARY

1. INTRODUCTION

V.M. Techno-Soft Pvt. Ltd. having its registered office at G-3, Sector-1, Avanti Vihar, Raipur (CG) is a private limited company and promoted by Mr. Vipin Malik. Company has proposed Common Bio-Medical Waste Treatment facility at Khasra 12/2, Halka Number 19, Village Kokodi, Tehsil Kondagaon, District Kondagaon, Chhattisgarh.

The company is an ISO 9001:2008 certified leading company in Raipur in the field of Waste Management services, Training & skill developments, Software Development, GIS, M-CAD & Data Processing service provider in Chhattisgarh. The company has its project execution centre located at Raipur, Rajnandgaon, Jagdalpul, Korba, Mandla, Jabalpur & Gwalior.

In order to assess the potential environmental impacts arising due to proposed project, the promoter has assigned the work of EIA study to M/s. ENPRO Enviro Tech & Engineers Pvt. Ltd. (ENPRO), Surat to prepare Draft EIA Study report for proposed common bio medical waste treatment facility. ENPRO Enviro Tech and Engineers Pvt. Ltd. is NABET Accredited organization (NABET/EIA/1619/SA 044 validity till July 10, 2019) under this sector. ENPRO entered into agreement with Anacon Laboratories Pvt. Ltd., Nagpur for use of base line monitoring data for the period of 16th October 2018 to 15th January 2019. Anacon Laboratories Pvt. Ltd., Nagpur is ISO 9001: 2008, ISO 14001: 2004, OHSAS Certified Organization and recognized by MoEF & CC also Accredited by Quality Council of India and Standard Authority of India Under FSS Act approved by Bureau of Indian Standard (BIS). ENPRO Team visited site and carried out ground survey for the various aspects to be covered in EIA Report.

2. PROJECT DESCRIPTION

2.1 Need of the Project

As per the BMW guideline, one CBWTF facility will cover 75 km area and 10000 beds. As per the record available, there is one common facility at Raipur (SMS Watergrace Enviroprotect Pvt. Ltd.) which is at distance of approx. 240 Kms from project site. Considering the number of nursing home and hospitals with beds in Bastar Division of Chhattisgarh and due to far distance the existing facility at Raipur (i.e. SMS Watergrace Enviroprotect Pvt. Ltd.) is not able to meet the requirement of these District/areas.

There are around 198 Hospitals and 916 clinics health sub centres in Bastar Division of Chhattisgarh. The estimated quantity of BMW is generated around 1056 kg/day. Waste without treatment shall not be kept more than 48 Hours. There is there is a need for centralized system for treatment because of difficulty faced by Private Hospitals and Nursing and Clinic of Bastar region.

The Chhattisgarh Environment Conservation Board invited a tender (No: 03/2017-2018/ Chhattisgarh Environment Conservation Board, Naya Raipur (CECB)/2017) for selection of Common Biomedical Waste Treatment Facility Service provider with intention to collect and treat bio medical waste generated in the region.

The tender was issued by Chhattisgarh Environment Conservation Board (CECB) and same was allotted to M/s. V.M. Techno-Soft Pvt. Ltd. after processing. Letter of intent mentioning the same was received on 29th June, 2018.

2.2 Location & Study Area

Proposed Common Bio Medical Waste Treatment Facility shall be set up at Khasra 12/2, Halka Number 19, Village Kokodi, Tehsil Kondagaon, District Kondagaon, Chhattisgarh.

SALIENT FEATURES IN STUDY AREA OF PROPOSED PROJECT

Particulars	Details	Approx. Distance from Project Site
Geographical Co-ordinates	Latitude: 19°33'53.00"N, Longitude : 81°42'50.00"E	-
Village /City / Industrial Area	Kokodi	0.70 km (SW)
District	Kondagaon	-
Nearest Water body	Bolari Nala Narangi River	3.6 km (SW) 7.3 km (SW)
Nearest Highway	Raipur-Jagdalpur NH-30	3.7km (NW)
Nearest Railway station & Railway line	Jagdalpur	65 km
Nearest Airport/ Airbase	Jagdalpur	65 km
Protected Area/ Sanctuaries	No	-
CRZ applicability	No	-

Note: All the above mentioned distances are aerial distances from the project site.

2.3 Salient Features of the Proposed Project

Proposed Capacity of Incinerator Autoclave Shredder	 200 Kg/hr 200 kg/batch 100 kg/hr
Proposed Capacity of Effluent Treatment Plant	Flow rate: 6.5 KLD Design Capacity: 10 KLD
Cost of Proposed Project	Rs. 2.85 crores (including cost of land)
Allocation for CSR Activities	Rs. 5,80,000 for next 5 yrs for required activities such as: i) Technical Training Centres (I.T.I)/Govt. School Funds; ii) Health Care Centres/Medical Camps; iii) Swachh Bharat Mission.
Estimated Manpower Required	During construction – 12 During Commissioning - 12 During operation - 03 - Managerial 13 - Skilled & Unskilled Workers
Area of Land	6072 m2 - for proposed project

Area of Green-Belt	2215 m2 (36.47 %)
Water Requirement - Total	**10.1 KLD** (4.1 KLD Fresh + 6 KLD Recycled)
Domestic	**1.4 KLD**
Gardening	**0.5 KLD**
Industrial	**8.2 KLD**
Incinerator	1.2 KLD
Floor Washing	0.8
Vehicle Washing	1 KLD (Recycled)
Scrubber	5 KLD (Recycled)
Solution Preparation	0.1 KLD
Steam Generation	0.1 KLD
Source of Water - Recycled	6 KLD
Fresh	4.1 KLD (from local village authority)
Waste water Generation	**7.38 KLD**
Industrial	6.08 KLD
Domestic	1.3 KLD
Mode of Treatment	
Industrial	Sent to Effluent Treatment Plant and treated waste water reused for washing and incineration scrubber
Domestic	Septic tank followed by soak pit
Power Requirement	200 KVA
Source of Power Supply	Chhattisgarh Vidyut Vitaran Company Ltd
Emergency Power Supply	1 Nos. D.G. Sets – 250 KVA each
Fuel Requirement	
Electricity for Incinerator	175 KVA
LDO for DG Set	10 Litres/Hr
Sources of Gaseous Emissions	Incinerator - 200 kg/hr D.G. Sets - 1 nos. – 250 KVA (stand-by)
Air Pollution Control Measures	Ventury Scrubber and Packed Bad Scrubber to incinerator
Solid / Hazardous Waste Generation	36.2 - Ash - 600 kg/day 34.3 - ETP Sludge - 100 kg/day Plastic Waste after Autoclave and shredding – 500 kg/day Glass and metallic body implants After Autoclave – 300 kg/day Metal Sharps after Autoclave and Shredding – As generated 5.1 - Waste oil – 10 kg/day Used Batteries – As generated
Solid / Hazardous Waste Disposal	36.2 - Send to TSDF site 34.3 - Send to TSDF site Plastic Waste after Autoclave and shredding - Send to Authorized Recyclers

	Glass and metallic body implants After Autoclave – Send to authorized recycler 5.1 – Send to Authorized Recyclers Used Batteries – Send to Authorized Recyclers

2.4 Process Description

A. Incineration System (Induction Plasma Pyrolysis)

This is a high temperature thermal process employing combustion of the waste under controlled condition for converting it into inert material and gases. Incinerator i.e. Induction Plasma Pyrolysis is an electrically powered system. It will include below components.

Incineration through Induction Plasma Pyrolysis (Primary chamber)	Burning of bio medical waste at 800°C to 850 °C degrading of organic waste.
Secondary chamber	Burning of flue gas up to 1000 °C -1050°C degrading of inorganic waste.
Gas dilution chamber	Reduce the concentration and temperature of thermal treated flue gas
Ventury	High pressure ejector ventury unit for liquid quenching treatment of thermal treated exhaust gas
Flue gas treatment media tank	5-7% NAOH water tank lined with isothalic FRP with high pressure pumping unit
Mist eliminator	Post quenching and filtering of exhaust gas and separate mist from gas (demisting).
ID fan	High capacity ID fan for sucking the high quantity of negative pressure generating the whole unit
Gas ducting	Containing passage of gases
Chimney	Discharge the treated gas from the machine to 30 mt above from ground level

B. Autoclave

An autoclave is a specialized piece of equipment designed to deliver 121°C temperature under 15 psi pressures to a chamber, with the goal of decontaminating or sterilizing the contents of the chamber. Decontamination is the reduction of contamination to a level where it is no longer a hazard to people or the environment. To ensure safety and quality control, all bio-hazardous materials and items contaminated with potentially infectious agents should be decontaminated before use or disposal. All Bio Medical waste like plastic baggage, syringe, cotton etc. have to sterilize in autoclave as per pollution norms for incinerator plant.

C. Shredding

Shredding is a process by which waste are de-shaped or cut into smaller pieces so as to make the waste unrecognizable. Shredder has non- corrosive sharp blades capable for shredding of plastic waste, sharps, bottles, needles, tubings, and other general waste. The low speed two shaft systems is effective for shredding hard and solid waste. The dis-infected waste shall then be segregated into HDPE, PP, rubber, latex, glass and metal. The segregated materials shall then be shredded completing the process of dis-infection and ensuring non-recycling of the waste materials for medical/ food grade purposes. Shredder is required for cutting small pieces (10-25 mm) of plastic, agro waste, paper in appropriate size as per pollution norms for incinerator plant. In the system 5 blades will be provided of which 3 will be movable and 2 fix blades.

3. Description of Environment

The baseline environmental status in the study area was studied for the various environmental attributes, as delineated in TOR, between 16th October 2018 to 15th January 2019 at different locations, including the proposed project site. The noise levels were measured and water, soil and air samples were collected and analysed by NABL approved laboratory, M/s. Team Labs & Consultants [NABL accreditation TC-5087]. All the samples were collected, preserved and analysed as per the standard procedures / methods.

Sr.	Environmental Attributes	Baseline Status
1.	**Ambient Air Quality**	6 stations - at proposed project site & nearest residential area in downwind direction & crosswind directions
	Observation - PM_{10} $PM_{2.5}$ SO_2 NO_X CO HC VOC	34.7 to 61.9 µg/m3 14.2 to 28.9 µg/m3 5.3 to 11.6 µg/m3 14.3 to 29.1 µg/m3 0.23 to 0.36 µg/m3 0.08 to 0.43 µg/m3 0.11 to 0.73 µg/m3
	Inference	All averageresults were within NAAQ permissible limits
2.	**Meteorological Status**	Meteorological data for period of 16th October 2018 to 15th January 2019 was given by NABL approved laboratory M/s. Anacon Laboratories Pvt. Ltd.
	Observation	Post monsoon season Pre-dominant wind – North-East to South-West Calm – 0.09 % Average wind speed – 2.30 m/s Maximum wind speed – 7.8 m/s Temperature range – 10 to 27.3 °C Relative Humidity range - 6 to 92 %
	Inference	Nearest residential area is 0.7 km SW of proposed project site.

Sr.	Environmental Attributes	Baseline Status
		There are 4 reserved forests within the study area - Chikalputo R.F. -1.85 km NW direction, Baniyagaon R.F. – 3.15 km SW direction, Makri R.F. – 7.67 km East Direction, North Golawand R.F. – 8.6 km West Direction.
3.	**Water Quality**	Surface water samples were collected from 6 different sources – Kokodi village, Chhotebanjoda, Chikhalput, Neota, Kachora and Kondagaon. Ground water samples were collected from 6 Bore well – Near project site, Chhotebanjoda, Chikhalput, Neaota, Kachora and Kondagaon.
	Observation	It was observed that some of surface water sources has higher TDS level (above acceptable limits but below permissible limits) as well as total coliform and fecal coliform was also present in surface water sources. Many of the Ground water monitoring stations results of some parameters such as total hardness and total alkalinity are above desirable limit of drinking water standards (IS 10500:2012) but below permissible limit of same.
	Inference	Surface water need Water treatment plant consisting of clarification, sand filtration, carbon treatment and disinfection, before it is used as domestic purpose. Ground water can be used as drinking water after treatment through RO plant.
4.	**Noise Quality**	Noise levels were measured at 6 locations in study area including proposed project site
	Observation	Equivalent noise levels in the residential areas varied from 48.3 – 56.2 dB(A) during day time. Equivalent noise levels in the residential areas varied from 37.8 – 43.9 dB(A) during night time.
	Inference	All results were within CPCB permissible limits
5.	**Soil Quality**	Soil samples were collected from 6 locations of study area including proposed project site
	Observation - Physical	Soils are predominantly sandy loam. Water Holding Capacity ranged from 20.06 to 32.56 %. Infiltration rate varies from 16.62 to 24.56 mm/hr Bulk density ranged from 1.47 to 1.62 gm/cm3 Sand is ranged from 34.06 to 69.75 %. Silt ranged from 20.36 to 41.11 %. Clay is ranged from 9.60 to 35.52 %.
	Chemical	pH ranged from 5.8 to 7 at 25 °C Electrical Conductivity ranged from 80 to 780 µS/cm.

Sr.	Environmental Attributes	Baseline Status
		Cation Exchange Capacity ranged from 12.93 to 15.83 meg/100gm soil. Exchangeable Sodium content ranged from 28.34 to 320.23 mg/kg soil. Exchangeable Potassium content ranged from 5.96 to 228.37 mg/kg soil. Exchangeable Calcium content ranged from 79.96 to 389.86 mg/kg soil. Exchangeable Magnesium content ranged from 22.71 to 238.39 mg/kg soil. Sodium Adsorption Ratio values range from 5.13 to 18.71. Total organic matter ranged from 13.6 to 2.91 %. Total organic carbon ranged from 0.79 to 1.69 %. Arsenic is absent in all soil samples. Boron content ranged from 0.39 to 0.48 mg/Kg. Cadmium is also absent in all soil samples except soil sample 6 (Kondagaon) is 0.03 mg/kg. Available Nitrogen ranged from 26.6 to 36.27 kg/hec. Available Phosphorus ranged from 0.19 to 0.76 kg/hec. Available potassium ranged from 58.04 to 416.7 kg/hec.
	Inference – Physical & Chemical	The pH of soil samples ranges from Moderately acidic to mildly alkaline. The cation exchange capacity of the soils is moderately contributed mainly by potassium exchangeable ions. The soil texture is predominantly sandy loam.
6.	**Land Use / Land Cover**	Satellite IRS P-6 LISSIV images were obtained from National Remote Sensing Centre (NRSC) Hyderabad. Land use / land cover mapping was carried out for 10 km radius area with proposed project site at centre.
	Observation	22 % area is forest area, 15 % area is dense jungle, 29 % area is dense mixed jungle, 9 % is built-up area, 9 % is agricultural land, 8 % is waterbodies, And 7 % area is covered with road.
	Inference	There is no any sanctuary or national park or other ecologically sensitive areas within study area. However, there are 4 reserved forests within the study area - Chikalputo R.F. -1.85 km NW direction, Baniyagaon R.F. – 3.15 km SW direction Makri R.F. – 7.67km East Direction, North Golawand R.F. – 8.6km West Direction. All the reserve forests are of Dense mixed type.

Sr.	Environmental Attributes	Baseline Status
7.	**Ecology and Biodiversity**	Study was carried out in core area and in buffer area in a scientific manner and ecological pursuance, validating primary data using secondary data. Biological assessment of study area was done to identify ecologically sensitive areas and to identify the presence of any Rare or Endangered or Endemic or Threatened (REET) species of flora or fauna in the study area.
	Observation - Core Zone	The proposed project site a govt. (leased to V.M.Techno-Soft) land with no vegetation. Few weed species are present here. The entire area is with terrestrial vegetation is without any forest or agriculture land and it was devoid of any ecologically sensitive biological resources. No REET species present in the core zone. No migratory corridors or breeding grounds for faunal species present here. The common butterflies, dragonflies, lizards, birds and smaller mammals are observed. The most commonly seen flora in the project site are *Achyranthes aspera, Hyptis suaveolens, Tridax procumbens are dominant here. Lantana camara, Cassia fistula, Prosopis juliflora, Delonix regia, Ptericarpus marsupium* are sporadically found near the boundary of the proposed project site. Various common types of grasses present near the site are found throughout the region. Within 5 sq km of core zone there are two Reserve forests are present. The faunal composition generally with arboreal and semi arboreal based animals. Some very common small animals such as rats, snakes, skinks and lizards are commonly found here. In aves, Mynas, Red vented bulbuls, Sparrows, Black drango and Indian Robin are present.
	Buffer Zone	Buffer zone is mostly with human habitations and agricultural fields. *Azadirachta indica, Ficus hispida, Borassus flabellifer, Prosopis juliflora, Pongamia pinnata, Dalbergia sisoo, Phoenix sylvestris, Albizia lebbeck, Diospyros melanoxylon, Delonix regia, Semicarpus anacardium, Gmelina arborea, Madhuca latifolia, Lannea coromandelica, Ptericarpus marsupium Acacia nilotica,* are dominant here. *Eucalyptus* is widely spread over buffer zone. Some scattered bushes of *Euphorbia tirucalli, Balanites roxburghii, Opuntia dillenii, Prosopis juliflora, Datura metel, and Zizyphus numularia* are also predominant here. *Pergularia daemia* and *Ipomoea nil* are climbers commonly present here. Buffer area is mainly rural environment with few aquatic bodies. Most of the region is covered with agricultural land and

Sr.	Environmental Attributes	Baseline Status
		villages. Hence, vegetative survey mainly conducted near road side, Pond side and near agricultural areas. There are no endangered and endemic plants present in the buffer and core zones. There are few medicinal, timber / fuel wood, fodder and other socio-economic purposes. The faunal composition was also estimated based on the direct and indirect evidences.
	Inference	There is good potential diversity within study area means no individual or few tree species are occurred continuously and species are evenly distributed in core and buffer zones. None of the terrestrial species in study area are under endangered and threatened species.
8.	**Geology**	Geologically the district is covered by metasediments and crystallines of Precambrian era constituting Bengpal, Bailadila, Dongargarh and Abujhamar groups of rocks. The lithounits include gneisses, granites, matasediments, basalt and gabbroic rocks, acid and basic intrusives. The oldest basement crystalline rocks and gneisses belonging to the Bengpal group were also noticed in the study area. The rock formations are mostly hard and compact pink and grey granites intruded by dykes and pegmatite veins. The rocks of Lower Proterozoic Dongargarh Super Group, comprising mainly of fine to medium grained potash rich Dongargarh Granite and its equivalents are common. The area comes under plateau and hilly region. General elevation of the area is between 550 and 750 m. amsl. Big granite boulders on hills, formed due to the differential weathering, are a common sight in this granitic terrain. Well-developed wide joints can also be seen in various areas. Effect of weathering through joints down to 40 metres can be very well observed during drilling in this formation. Intrusives of pegmatite / quartz vein can be often seen in this granite.
	Hydrology	In granite and gneisses the yield of wells depends upon structure, lithology and landform. Of these, structure controlled by lineament plays a major role in controlling the yield. Generally, the site located along the lineaments or in close vicinity of lineaments have given high yields whereas sites away from the lineaments have given poor yields. Felsic rocks (Pink granite) have more fractures compared to mafic and mafelsic rocks. The depth of bore wells ranges between 60 and 135 m below ground level (bgl). Based on the exploration data it can be inferred that the weathered thickness in granites ranges between

Sr.	Environmental Attributes	Baseline Status
		16 and 40 mbgl. Weathered granite followed by fracture zone favours the aquifer to possess good quantity of water. In general, the shallow fractured zone lies within 80 m depth. The yields of the wells generally varies from < 1 to 3, and even up to 5 litres per second (lps). The CGWB exploration studies indicated that the ground water yields vary from 3 to 15 lps and specific capacity varies between 23 and 37 lpm/mdd. The transmissivity varies from 1-m2/day to 44- m2/day. (CGWB 2012-13). The unconsolidated formation of Quaternary age comprising fluvial alluvium, clay silt, laterite etc. form thin and extensive unconfined aquifers in several isolated patches and near river and its stream courses with thickness up to 30 mbgl as observed along the Narangi river.
	Inference	CGWB has categorized this area as "safe" with the stage of ground water utilization of 4.52 %, indicating good scope for further ground water development in as per Ground water Assessment 2009, CGWB 2012-2013.
9.	**Socio-Economic Status**	Primary data was collected from 10 % sample villages and correlated with secondary data
	Observation	A total of 34 villages fall fully or partially in the radial distance of 10 km from the project site M/s V.M. Techno-Soft Private Ltd at Khasra 12/2, Halka Number 19, Village Kokodi, District Kondagaon, Chhattisgarh. All the project area is rural and all villages falls in Kondagoan taluka of Kondagoan district of Chattishgarh State. The work participation rate is maximum in the village Chikhalputi (63.2%) and the minimum is in village Chichpolang (28.3%); while the average work participation rate is 54.2% in the villages located in the radial distance of 10 km from the project site. In the sample village, it was reported that the population largely engaged in agriculture sector (50%); followed by Casual labor work (29%); and Petty Business (7%). It is also observed that about 16% of the population is also engaged in service sector, of which 2% skilled jobs and 14% are engaged in unskilled jobs. For doing the skilled jobs by large the population migrated to other places.
	Inference	To initiate literacy program and sanitation system in study area, under Corporate Social Responsibility. It is to be noted that the skill gaps in the industries for persons having skilled jobs degree, are largely fulfilled by the urban areas while the persons with unskilled jobs are

Sr.	Environmental Attributes	Baseline Status
		largely taken up from surrounding villages during construction and operation stage of the industries. 40 workers will be required in construction and operation stage. Considering absence of facilities like training centres-ITIs, Sanitation facilities and commercial banks; proponent has decided to spend total Rs. 5.80 Lakhs in next 5 years as a CSR activities which shall include Technical training centres/educational support for government schools, Health care centres/Medical camps and funds for Swachh Bharat Abhiyan for nearby villages.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact identification matrix has been developed by establishing cause-effect relationship between activities of proposed project and various environmental attributes.

Since the entire treated effluent will be recycled back to the industries for reuse in washing and incineration scrubber, there will be reduction in the groundwater withdrawal. Hence no major impact has been envisaged on the water resources in quantitative terms.

There will be no discharge of waste water into any water body or surface body/land, so there is insignificant effect on surface water and ground water quality.

High pressure drop Venturi Scrubber will be provided for removal of particulate matter and partial acidic gases by absorption with caustic solution, followed by packed bed scrubber for removal of complete acidic gases from flue gas. Modelling of pollutant emission (PM, HCL, NO_X) was carried out using AERMOD to assess incremental ground level concentration within study area. Incremental ground concentration due to proposed project was found insignificant in study area.

Hazardous waste generated from the facility will be disposed to TSDF site. Ash generated from incinerator and ETP sludge will be sent to TSDF site. Other waste after Autoclave and Shredding such as Plastic, Glass and metallic body, Metal Sharps and Used batteries shall be sent to authorized recyclers. There shall be no unscientific or improper disposal of solid / hazardous waste on land, there shall be insignificant impact on land condition.

There is insignificant effect on ecology, biodiversity, geology and hydrogeology aspects. Due to construction of CBMW there is irreversible effect on land use pattern. Excavated soil shall be reused for development of green belt at project site. Project site shall have 36.47 % green belt cover.

All the construction and operation phase activities of the proposed project will require skilled, semi-skilled and unskilled labour, thereby creating temporary as well as permanent employment for the local people. As local people will be hired on priority basis, there shall be

no influx of people in the region. Hence, the socio-cultural and economic structure within the study area is also not likely to be affected.

5. ENVIRONMENTAL MONITORING PROGRAMME

For the proposed project, monitoring activity is mainly envisaged for ambient air quality parameters, water quality, water quality, soil quality, noise levels and to collect data to keep a check on performance of CBMW facility. An effluent quality-monitoring programme will be put in place by the CBMW facility, which includes location of monitoring, frequency of monitoring and specification of parameters to be monitored in line with Central Pollution Control Board (CPCB) guidelines.

ENVIRONMENTAL MONITORING PARAMETERS & FREQUENCY

Sr. No.	Item / Attribute	Parameters	Frequency & Responsible Party
1.	Ambient Air quality	Particulate Matter [$PM_{2.5}$] & [PM_{10}], Sulphur Dioxide[SO2], HCl, Nitrogen Dioxide[NOx] and Carbon Monoxide [CO] , VOC	Once in 3 months at project site and at Villages within 10 KM radius (6 stations) By External Lab
2.	Process Gas Emission from Stack (Incineration)	PM, HCl, NOx	Once in 3 months By External Lab
		Hydrogen Floride, Total Organic Carbon	Once in 3 Months By External Lab
		Dioxin & Furan	Once in a year By External Lab
3.	Emission from Stack (Incineration)	CO, O2 (Or as added in future by CPCB)	On line monitoring (CEMS) connected to CPCB / SPCB server
4.	Work Place Monitoring	$PM_{2.5}$, PM_{10}, SO_2, NO_X, Noise, Temperature, Humidity.	Once in 3 Months by External Lab. Or In house by EHS Exe./Sr. Chemist
5.	Ground Water	As per IS 10500	Twice in a year (except monsoon)
6.	Waste Water	pH, EC, Turbidity, TDS, Calcium, Magnesium, Total Hardness, Total Alkalinity, DO, COD, BOD Chlorides, Sulphates, Phosphate, Ammonia, Nitrite, oil & grease, Bio assay test (Heavy Metals if required)	Monthly by external lab
		pH, COD, TDS, BOD, Flow	Daily by internal lab

			(Or On line as per future guideline of CPCB)
		Flow at inlet and outlet	On line monitoring on continuous basis provided with recorder
7.	Noise	Equivalent Noise Level - dB (A) (At least 1 hr. continuous)	Once in 3 Months by external lab
8.	Soil	pH, EC, Moisture, Organic matter, N, P, K, SO_4-2, Cl-, Ca+2, Mg+2 & Na+	Once in a year
9.	Hazardous Waste	General Parameters	Once in a year by External Lab.
10.	Greenbelt	Number of Plantation (Units), Number of Survived Plants/Trees, Number of Poor Plant/Trees	Throughout Year at regular interval: In House by EHS Executive & other EMC members
11.	Employee Medical/Health Check-up	As per statutory provision & requirement	Yearly through Approved Medical Officer & Doctor as per OHS Plan

In addition to above table, preventive maintenance plan covering all the equipment's shall be prepared and strictly followed by maintenance staff. All the details shall be maintained in log-book for efficient implementation.

The General Manager of the unit will co-ordinate all monitoring programs at the site and the data generated will be submitted regularly to the statutory agencies. Frequency of reporting shall be once in every six months to GPCB and Regional Office of MoEF & CC.

6. ADDITIONAL STUDIES

6.1 Hazard Identification, Risk Assessment and Mitigation Measures

Identification of hazards at the proposed site indicates the characteristics of hazardous wastes that pose potential for an emergency situation. At the proposed V.M. Techno-Soft site, following type of hazardous wastes may be involved during the operation of facility, which can create potential emergency situation in the event of spillage and accidental release of hazardous wastes from the site:

- Wastes produced by hospitals
- Laboratories
- Health care sub centre

These wastes include both infectious ("red bag") medical wastes as well as non-infectious, general housekeeping wastes. The emission factors presented here represent emissions when both types of these wastes are combusted rather than just infectious wastes.

Hospitals, laboratories and health care sub centre and other disinfectants, anti-neoplastic agents, heavy metals (e.g. Mercury), etc. These wastes are hazardous in nature and if properly segregated and managed can be transported to hazardous waste management facility for treatment/ storage/ disposal.

Commonly referred to as Clinical and pathological Wastes and include: isolation wastes (refuse associated with infectious patients), cultures and stocks of infectious agents and associated biological, human blood and blood products, pathological wastes, contaminated sharps, amputated body parts, placenta and others.

Risk Assessment is a structured approach to identifying and understanding the risks associated with Storage and Handling of Hazardous/toxic chemicals. The assessment starts by taking into account an inventory of hazardous chemicals stored, likelihood of leakage/spillage associated with it and selecting the worst case scenario for consequence estimation. **Qualitative Risk Assessment** has been carried out by using methodology called HIRA-Hazards Identification & Risk Assessment.

Qualitative Risk Assessment has been carried out for the following areas:

1. Working at DG Set Area
2. Other Operational Activities Carried Out at Site
    - Hazardous Solid Waste transportation from generation site to Bio-Medical Waste Treatment Facility (V.M. Techno-Soft) site
    - Weighing and Sampling of Waste
    - Incineration
    - Autoclave
    - Shredding

Solid Waste Storage Area & Incinerator Area have been identified the potential for major hazards.

All possible precautionary measures shall be taken on-site and structures to prevent any hazard. Suitable fire extinguishers along with fire and smoke detection alarm system shall be provided at various places in the plant and laboratory.

CBWM staff will be trained for safe handling of ETP chemicals and operation of treatment units. All personnel working at CBWM will be provided with necessary personnel protective equipment (PPEs). Periodical medical check-up shall be done for all employees at least once in a year.

A proper Emergency and Disaster Management Plan shall be in place and shall be accessible to the security staff and all the key personnel. The roles and responsibilities of all the key personnel shall be clearly identified and addressed to the key personnel.

7. PROJECT BENEFITS

Proposed project will help in attaining better hygienic conditions, as Bio-Medical waste shall be disposed of in scientific manner instead of dumping along with solid waste.

The proposed project is expected to yield a positive impact on the socio economic environment. It helps sustain the development of this area including further development of physical infrastructural facilities. The beneficial impact of proposed project on the civic amenities will be substantial after the commencement of project activities. The basic requirement of the community needs will be strengthened by extending health care to the community, building / strengthening of existing roads in the area which will help in uplifting the living standards of local communities.

The project will lead to direct and indirect employment opportunity. Employment is expected during construction and operation period, waste lifting and other ancillary services. A major part of this labour force will be mainly from local villagers. This project will help in improving income of local villagers who will get direct and indirect employment.

Proposed project will generate 40 direct and indirect employment generation during construction and operation phase.

8. ENVIRONMENTAL MANAGEMENT PLAN

Guidelines for Management, Operation and Maintenance of plant issued by Central Pollution Control Board (CPCB) will be followed to operate plant effectively and efficiently. Maintenance schedule of plant is planned, considering stand by storage facility, availability of manpower, availability of maintenance tools, safety equipment and other required facilities. Preventive maintenance schedule for plant machineries will be prepared and strictly followed on regular basis for effective and efficient operation of plant. Training will be imparted to plant operating staff as well as waste transporters on regular basis.

Operator shall follow an SOP mentioning operation of bio medical waste facility and also shall inform prescribe authority about occupiers who are not sending segregated Bio Medical waste as per rules. Operator shall maintain all the records for operation of incinerator, shredder and autoclaving.

Occupiers who are giving waste, will be allowed to inspect site and see whether operator is carrying out treatment properly or not. Facility shall supply non-chlorinated plastic coloured bags to authorized occupier if required and shall collect bio-medical waste during holiday period as well.

In case for any reason if it becomes necessary to store waste beyond such a period, the occupier shall be trained to take appropriate measures to ensure that the waste does not

adversely affect human health and the environment. Occupier should inform prescribed authority along with the reasons for doing so.

8.1 Environmental Management Cell

The overall management of the project will be looked after by Managing Director. The technical and scientific staff will be appointed under General Manager.

- Qualified and experienced personnel in the field of environment pollution control shall be recruited as a plant in-charge for overall responsibility for plant operation and for looking after Environment, Health and Safety aspects of the plant. Plant in-charge will be responsible for collection, transportation and receipt of waste at site.
- Account and HR Manager and Environmental Manager will report to General Manger and will support for better implementation of EMP.
- Environmental Manager who is also responsible for Environment, Health and Safety will look after all statutory compliances associated with plant operation and environmental Manager will be directly reporting to General Manger.
- Lab In-charge will be reporting Environmental Manager and will be responsible for implementation of Environmental Monitoring Plan.
- Plant Operators will be reporting to plant in charge as well as Shift in-charge and will be responsible for operation and maintenance of the facility in each shift of operation.