

# EXECUTIVE SUMMARY

(English & Hindi)

for

**Proposed Project of Common Bio Medical Waste Treatment Facility (CBMWTF) under which Induction Plasma Pyrolysis capacity of 200 kg/hour, Autoclave capacity of 200 kg/Batch and Shredder capacity of 100 kg/hour**

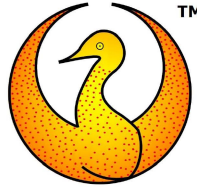
at

**V.M. Techno-Soft Pvt. Ltd.**

**Khasra 1/23 (1 Acre land), Halka Number 31, Village Bhitthikala, Tehsil Ambikapur, District Surguja, Chhattisgarh.**

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

## **EIA Consultant**



**ENPRO Enviro Tech and Engineers Pvt. Ltd.**

**(QCI-NABET Accreditation vide Certificate No.: NABET/EIA/1922/RA 0122 valid till 12<sup>th</sup> January, 2022)**

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

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

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

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<b>ENPRO Enviro Tech and Engineers Pvt. Ltd.</b>			
Client	V.M. Techno-Soft Pvt. Ltd.		
Project	Draft Rapid EIA Report		
Report No	EP/REIA/22	Rev.	0
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# EXECUTIVE SUMMARY

## 1. INTRODUCTION

M/s. 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. 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.

Company proposes to establish a new Common Bio Medical Waste Treatment facility at Khasra 1/23 (1 Acre land), Halka Number 31, Village Bhitthikala, Tehsil Ambikapur, District Surguja, Chhattisgarh. The proposed site is located at Latitude: 23°05'35.20"N, Longitude: 83°8'53.00"E. The Land was in possession of Nagar Palik Nigam Ambikapur and is notified for the purpose of setting up of Common Bio-medical Waste Treatment Facility for Surguja Division and now the same has been given to M/s V. M. Techno-Soft Pvt. Ltd.


In order to assess the potential environmental impacts arising due to proposed project activities, 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. The proposed project falls under Category B and project activity 7(da) as per EIA notification 2006, as amended time to time. ENPRO Enviro Tech and Engineers Pvt. Ltd. (ENPRO) is NABET Accredited (NABET/EIA/1922/RA 0122 valid till 12<sup>th</sup> January, 2022) under this sector. ENPRO (Environmental Laboratory) has conducted base line monitoring for the period of 16<sup>th</sup> October 2019 to 15<sup>th</sup> January 2020. Environmental Laboratory is recognized by MoEF & CC also Accredited by NABL. ENPRO Team visited site and carried out ground survey for the various aspects which was covered in EIA Report.

## 2. PROJECT DESCRIPTION

### 2.1 Need of the Project

As per the guideline for CBMWTF, one CBWT facility will cover 75 km area and 10000 number of beds. As per existing scenario for the Surguja division; one common BMW treatment facility at Bilaspur is being operated which is at distance of approx. 230 km from the proposed project site. Considering the number of nursing home and hospitals with beds in Surguja Division of Chhattisgarh and due to unavailability of the facility within the area, it is required to establish a new CBMWTF in Surguja division.

Moreover, Surguja Division of Chhattisgarh consists of approx. 356 Hospitals and 1052 Govt. health subcentres with 4454 Beds. Estimated quantity of BMW generated in the region is 1120 kg/day. At present there is no CBMW facility available in surrounding area of 75 km. Bio Medical waste shall not be kept for more than 48 Hours without treatment. There is a need for centralized system for treatment because of difficulties faced by Private Hospitals and Nursing and Clinic to treat these wastes.

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In view of above, Chhattisgarh Environment Conservation Board invited a tender (No: 03/2017-2018/ Chhattisgarh Environment Conservation Board, Naya Raipur (CECB)/2018) for selection of Common Biomedical Waste Treatment Facility Service provider with intention to collect and treat bio medical waste generated in the region same was allotted to M/s. V.M. Techno-Soft Pvt. Ltd. after tendering process. Letter of intent mentioning the same was received on 8<sup>th</sup> February, 2019.

## 2.2 Location & Study Area

Proposed project shall be located at Khasra 1/23 (1 acre land), Halka Number 31, Village Bhitthikala, Tehsil Ambikapur, District Surguja, Chhattisgarh.


### SALIENT FEATURES IN STUDY AREA OF PROPOSED PROJECT

Particulars	Details	Approx. Distance from Project Site
Geographical Co-ordinates	Latitude: 23°05' 35.20" N Longitude: 83°08' 53.00" E	-
Village /City / Industrial Area	Ambikapur	3 km (NE)
District	Surguja	
Nearest Water body	Banki Dam Gungata Reservoir	12 km (E) 11 km (SE)
Nearest Highway	Ambikapur, NH-130	1.5 km (SE)
Nearest Railway station & Railway line	Ambikapur	4.8 km (NE)
Nearest Airport/ Airbase	Ambikapur (Darima)	12 km (NE)
Protected Area/ Sanctuaries	Not within study area	-
CRZ applicability	Not within study area	-


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

## 2.3 Salient Features of the Proposed Project

Proposed Capacity:	
Incinerator (Induction Plasma Pyrolysis)	200 Kg/hr
Autoclave	200 kg/batch
Shredder	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
Allocation for CER Activities	Rs. 5,70,000 for next 5 yrs for required activities such as: i) Education Support in Government Public School ii) Health Care Centres / Medical Camps

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		iii) Water and Sanitation (Swachh Bharat Mission) iv) Social Cultural Activities and Solar Lighting in schools and Tree plantation v) Rain water harvesting/ Over head tank for Running Water in nearby villages
Estimated Manpower Required		<b>Total Manpower - 40</b> During construction – 12 During Commissioning - 12 During operation - 03 - Managerial 13 - Skilled & Unskilled Workers
Area of Land		4062 m <sup>2</sup> - for proposed project
Area of Green-Belt		1340 m <sup>2</sup> (33.0 %)
Water Requirement - Total		<b>12.5 KLD</b> (6.5 KLD Fresh + 6 KLD Recycled)
	<b>Domestic</b>	<b>1.8 KLD</b>
	<b>Gardening</b>	<b>2.5 KLD</b>
	<b>Industrial</b>	<b>8.2 KLD</b>
	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	6.5 KLD (from Borewell)
Waste water Generation		<b>7.68 KLD</b>
	Industrial	6.08 KLD
	Domestic	1.6 KLD
Mode of Treatment	Industrial	Sent to Effluent Treatment Plant and treated wastewater will be reused for washing and incineration scrubber
	Domestic	Septic tank followed by soak pit
Power Requirement		Project will consume 200 KVA power
Source of Power Supply		Chhattisgarh Vidyut Vitaran Company Ltd
Emergency Power Supply		1 Nos. D.G. Sets – 230 KVA each
Fuel Requirement		
	LDO for DG Set	40 Litres/Hr
Sources of Gaseous Emissions		Incinerator - 200 kg/hr D.G. Sets - 1 nos. – 230 KVA (stand-by)
Air Pollution Control Measures		Ventury Scrubber and Packed Bed Scrubber to incinerator followed by 30 m stack height
Solid / Hazardous Waste Generation		• Ash from incinerator - 600 kg/day

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	<ul style="list-style-type: none"> <li>• ETP Sludge - 100 kg/day</li> <li>• Plastic Waste after Autoclave and shredding – 500 kg/day</li> <li>• Glass and metallic body implants After Autoclave – 300 kg/day</li> <li>• Metal Sharps after Autoclave and Shredding – As generated</li> <li>• Waste oil – 10 kg/day</li> <li>• Used Batteries – As generated</li> </ul>
Solid / Hazardous Waste Disposal Management	<ul style="list-style-type: none"> <li>• Ash from incinerator - Send to TSDF site for landfilling</li> <li>• ETP Sludge - Send to TSDF site for landfilling</li> <li>• Plastic Waste after Autoclave and shredding -Send to Authorized Recyclers</li> <li>• Glass and metallic body implants After Autoclave – Send to authorized recycler</li> <li>• Waste Oil - Send to Authorized Recyclers</li> <li>• Used Batteries – Send to Authorized Recyclers</li> </ul>

## 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.

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

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## 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.

### TECHNICAL SPECIFICATIONS OF AUTOCLAVE


Description	Specification
Capacity	200 Kg/Batch
MOC	SS -304
Model No	BLUTEK AC200
Insulation	Ceramic wool on outer side
Pressure	2.1 kg/cm <sup>2</sup>
Air Emission	Highly Odorous but Non Toxic
Heating Media	By steam generated from Electric heater arrangement
Feeding	Manual through horizontal Trolley
Safety Instrument	Pressure Gauge and Safety Valve
Temperature	121 to 134 °C
Design Temperature	150 °C
Water Emission	Odorous May Contain Live Micro Organisms at Base
Treatment Effluent	Low Wet Waste 10 % Heavier all Material Acceptance Recognizable

(Source: M/s. V.M. Techno-Soft Pvt. Ltd.)

## 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.



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### TECHNICAL SPECIFICATIONS OF SHREDDER

Description	Specification
Capacity	100 Kg/Hr.
MODEL No	BLUTEK-SDR100
Waste Materials	Biomedical waste
Power	3 HP
Motor	3 Phase 50 Hz 415 VAC
Hopper Size	300 X 400 mm Height
Drive	V belt Pulley drive
Required Space	4 m <sup>2</sup> (only machine)
MOC	MS Fabricated
MOC of Blade	W.P.S. Hardened changeable Blade
Control Panel	Dual starter ON/OFF switch
Shredding Size	25 X 50 mm Waste Cutting.
Bearing	SKF/ZKL Ball Bearing
Cutting Blade	5 Nos. (3 movables & 2 fix blade)


(Source: M/s. V.M. Techno-Soft Pvt. Ltd.)

### 3. Description of Environment


Baseline environmental status in the study area was studied for the various environmental attributes, as delineated in TOR, between 16<sup>th</sup> October 2019 to 15<sup>th</sup> January 2020 at different locations, including the proposed project site. Water, Soil, Noise and Ambient Air Monitoring samples were collected and analysed by NABL Accredited and MoEF&CC recognized laboratory M/s. ENPRO Enviro Tech and Engineers Pvt. Ltd., Surat. All the samples were collected, preserved and analysed as per the standard procedures / methods.

Sr.	Environmental Attributes	Baseline Status
1.	<b>Ambient Air Quality</b>	6 stations - at proposed project site & nearest residential area
	Observation - PM <sub>10</sub>	50.0 to 96.0 µg/m <sup>3</sup>
	PM <sub>2.5</sub>	17.0 to 54.0 µg/m <sup>3</sup>
	SO <sub>2</sub>	2.2 to 26.1 µg/m <sup>3</sup>
	NO <sub>x</sub>	2.9 to 18.6 µg/m <sup>3</sup>
	CO	Below Detectable Limit (BDL)
	NH <sub>3</sub>	Below Detectable Limit (BDL)
	HC	Not Detected (ND)
	VOC	Not Detected (ND)
	PAH	Not Detected (ND)
	Inference	All results (average) were found within NAAQ permissible limits
2.	<b>Meteorological Status</b>	Meteorological data for period of 16 <sup>th</sup> October 2019 to 15 <sup>th</sup> January 2020 was given by NABL approved laboratory M/s. ENPRO Enviro Tech and Engineers Pvt. Ltd., Surat




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Sr.	Environmental Attributes	Baseline Status
	Observation	<p>Post monsoon season  Pre-dominant wind – North-East to South-West  Calm condition– 75.40 %  Average wind speed – 0.39 m/s  Maximum wind speed – 6.0 m/s  Temperature range – 6 to 25°C  Relative Humidity range - 26 to 89 %</p>
	Inference	<p>Nearest residential area is Thor Village which is 700 m from proposed project site.  There are reserved forests within the study area as mentioned below -  Sandbar R.F - 0.3km NW direction  Pilkha P.F - 5.6km NW direction  Sonpur R.F – 7.8km W direction  Sukhri P.F - 8.2km W direction  Patrapara R.F – 7.9km SW direction  Salka R.F - 7.6km SW direction  Chandra R.F - 9.1km E direction  Khairbar R.F - 7.9km NE direction  Pasang R.F - 8.2km NE direction</p>
3.	<b>Water Quality</b>	<p>Surface water samples were collected from 6 different sources –  1) Gungata River near Krishnapur Village (River)  2) Gungata Right Canal (Canal)  3) Gungata river near Bartika Village (River)  4) Lake near Ambikapur Town (Moulvi Bandh) (Lake)  5) Lake Near Pilkha Village (Lake)  6) Check dam near Sapna Village (Check Dam)</p> <p>Ground water samples were collected from 7 Bore well –  1) Near Project Site(Hand Pump)  2) Mendra Kalan Village(Hand Pump)  3) Bakirma Village(Hand Pump)  4) Jagdishpur Village(Hand Pump)  5) Mukundpur Village(Hand Pump)  6) Ambikapur Village(Hand Pump)  7) Morbhanj Village(Hand Pump)</p>
	Observation	<p><b>Surface water</b> samples SW1, SW3 are river water, SW4, SW5 are lake water, SW2 is canal water and sample SW6 is check dam water. These samples have TDS levels in range of 98 mg/L to 426 mg/L. Chlorides as Cl level in range of 9.6 mg/L to 72.3 mg/L. Sulphates as SO<sub>4</sub> level in range of 3.4 mg/L to 26.4 mg/L. Hardness level in range of 50 mg/L to 180 mg/L. Calcium as Ca level in range of 12 mg/L to 36 mg/L.</p>

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Sr.	Environmental Attributes	Baseline Status
		<p>Magnesium as Mg level in range of 2.4 mg/L to 26.7 mg/L. Iron as Fe level in range of 0.2 mg/L to 0.4 mg/L. Colour level in range of 38.2 Hazen to 59 Hazen. Microbiological parameters Coliform was present in surface water.</p> <p><b>Ground water</b> sample analysis results indicate that TDS are higher at sampling points GW1, GW2, GW5 and GW6. Other sample points GW3, GW4 and GW7 have TDS in desirable limit (&lt;500 mg/L). Major Heavy Metals in ground water samples is found below detection limit, however presence of Iron was observed in GW1, GW5 and GW7 and presence of Aluminum and Magnesium were observed in all ground water samples due to the soil characteristics of the region. Microbiological parameters Coliform and Fecal Coliform were absent in Ground water.</p>
	Inference	<p>Surface water sources needs water treatment plant consisting of clarification, sand filter, carbon filter and disinfection treatment before they are used for domestic purpose.</p> <p>Ground water is fit for use as industrial water and for non-direct contact domestic purpose after basic filtration and disinfection treatment. After desalination treatment ground water can be used for low TDS water application.</p>
4.	<b>Noise Quality</b>	Noise levels were measured at 7 locations in study area including proposed project site
	Observation	Equivalent noise levels in the residential areas varied from 48.7 – 54.1 dB(A) during day time. Equivalent noise levels in the residential areas varied from 41.2 – 44.2 dB(A) during night time.
	Inference	All results were within CPCB permissible limits
5.	<b>Soil Quality</b>	Soil samples were collected from 7 locations of study area including proposed project site
	Observation - Physical	Soils are predominantly clay loam. Water Holding Capacity ranged from 8% to 14 %. Sand is ranged from 1.1 to 21.7 %. Silt ranged from 6.8 to 65 %. Clay is ranged from 26.7 to 92.1 %.
	Chemical	pH ranged from 5.36 to 8.73 at 25 °C Electrical Conductivity ranged from 90.6 to 950 mS/cm. Cation Exchange Capacity ranged from 16.25 to 48.80 meg/100gm soil.

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Sr.	Environmental Attributes	Baseline Status
		Exchangeable Sodium content ranged from 76.5 to 139 mg/kg soil. Exchangeable Potassium content ranged from 53.7 to 259 mg/kg soil.
	Inference – Physical & Chemical	The pH of soil samples ranges from strong acidic to neutral however, at one location soil sample is strong alkaline. The cation exchange capacity of the soils is moderate. The soil texture is predominantly clay loam.
6.	<b>Land Use / Land Cover</b>	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	13 % area is forest area, 6 % area is fairly dense jungle, 4 % area is open mixed jungle, 16 % is built-up area, 38 % is agricultural land, 9 % is waterbodies, 9 % area is covered with road and rest 5 % is railways and open scrubs.
	Inference	There is no any sanctuary or national park or other ecologically sensitive areas within study area. However, Sandbar R.F - 0.3 km NW direction, Pilkha P.F - 5.6 km NW direction, Sonpur R.F – 7.8 km W direction, Sukhri P.F - 8.2 km W direction Patrapara R.F – 7.9 km SW direction, Salka R.F - 7.6km SW direction, Chandra R.F - 9.1 km E direction, Khairbar R.F - 7.9 km NE direction, Pasang R.F - 8.2 km NE direction is found in the study area of 10 km radius.
7.	<b>Ecology and Biodiversity</b>	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 Some common trees, Shrubs and herbaceous species such as <i>Azadiracta indica</i> (4 medium size trees of below 4 m height, Average GBH 22 cm), <i>Ficus religiosa</i> (2 nos), <i>Tridax procumbens</i> , <i>Lantana camara</i> , <i>Diospyros melanoxylon</i> (3 nos) are going to be removed. The entire area is with terrestrial vegetation is without any

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Sr.	Environmental Attributes	Baseline Status
	Buffer Zone	<p>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 <i>Achyranthes aspera</i>, <i>Hyptis suaveolens</i>, <i>Tridax procumbens</i> are dominant here. <i>Lantana camara</i>, <i>Cassia fistula</i>, <i>Phenix sylvestris</i>, <i>Prosopis juliflora</i>, <i>Delonix regia</i>, <i>Ptericarpus marsupium</i> 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.</p> <p>Buffer zone is mostly with human habitations and agricultural fields. There are eight reserve forests are present in the buffer zone area. They are Pilkha P.F - 5.6km NW direction, Sonpur R.F – 7.8km W direction, Sukhri R.F - 8.2km W direction, Patrapara R.F – 7.9km SW direction, Salka R.F - 7.6km SW direction, Chandra R.F – 9.1km E direction, Khairbar R.F – 7.9km NE direction, Pasang R.F - 8.2km NE direction are having characteristic tree species <i>Leucaena leucocephala</i>, <i>Trema orinentalis</i>, <i>Madhuca latifolia</i>, <i>Phoenix sylvestris</i>, <i>Prosopis juliflora</i>, <i>Wrightia tomentosa</i>, <i>Acacia nilotica</i>, <i>Pongamia pinnata</i>, <i>Dalbergia sissoo</i>, <i>Azadirachta indica</i>, <i>Diospyros melanoxylon</i>, <i>Delonix regia</i>, <i>Semicarpus anacardium</i>, <i>Gmelina arborea</i>, <i>Lannea coromandelica</i> <i>Ptericarpus marsupium</i>, <i>Cassia fistula</i> and <i>Tectona grandis</i>. Trees such as <i>Grewia hirsuta</i>, <i>Dalbergia sissoo</i>, <i>Syzizium cumini</i> are also present sporadically. The most common shrubs are <i>Wrightia tinctoria</i>, <i>Lantana camara</i>, <i>Dodonia viscosa</i>, etc., The commonly seen climbers are <i>Abrus precatorius</i>, <i>Asparagus racemosus</i>, <i>Cassytha filiformis</i>, <i>Cissus quadrangularis</i>, <i>Clitoria ternatea</i>, <i>Evolvulus alsinoides</i>. The common grass species present are <i>Apluda mutica</i>, <i>Brachiaria eruciformis</i>, <i>Chloris barbata</i>, <i>Chloris virgata</i>, <i>Cynodon dactylon</i>, <i>Cyperus rotundus</i>, <i>Digitaria ciliaris</i> and <i>Fimbristylis cymosa</i>.</p> <p>The common species present near village woodland, Agriculture, Road side and river side are <i>Azadirachta indica</i>, <i>Ficus hispida</i>, <i>Borassus flabellifer</i>, <i>Prosopis juliflora</i>, <i>Pongamia pinnata</i>, <i>Dalbergia sisoo</i>, <i>Phoenix</i></p>


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		<p><i>sylvestris, Albizia lebbeck, Diospyros melanoxylon, Delonix regia, Semicarpus anacardium, Gmelina arborea, Madhuca latifolia, Lannea coromandelica, Ptericarpus marsupium Acacia nilotica,</i> are dominant here. <i>Eucalyptus</i> is widely spread over buffer zone. Some scattered bushes of <i>Euphorbia tirucalli, Balanites roxburghii, Opuntia dillenii, Prosopis juliflora, Datura metel, and Zizyphus numularia</i> are also predominant here. <i>Pergularia daemia</i> and <i>Ipomoea nil</i> 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 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.</p>
	Inference	<p>Distribution pattern of species in the study area is identified as <b>random distribution</b>. Throughout the study area, there no direct evidence of wild animal species observed. None of the terrestrial species are present under endangered and threatened species, and not listed in the Schedule I of the Indian Wildlife (Protection) Act, 1972 as amended in 1991.</p>
8.	<b>Geology</b>	<p>The study area is characterized by flat topped lateritic table lands with pockets of bauxite deposits, whereas the surrounding low-lying plains comprises of Archaean granite gneisses and schists. The laterites are largely surficial weathered products of basalts originated from the Deccan Trap lava flows. The Intertrappean and Lametas Formations underlie the Deccan Traps and are exposed at places.</p> <p>Based on tectonic features and records of past earthquakes, the Bureau of Indian Standards (BIS) has prepared a seismic zoning map of India as shown in EIA Report. This is the latest version of seismic zoning map of India given in the earthquake resistant design code of India [IS 1893 (Part 1) 2002] assigns four levels of seismicity for India in terms of zone factors. As per these norms the study area is located in Zone-III indicating moderate intensity.</p>
	<b>Hydrology</b>	Ground water is usually developed by means of dug

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		<p>wells and bore wells. During the field surveys in the study area well inventory of representative dug / borewells were undertaken on 23rd November 2019 with in the 10 km radius of the proposed project area, covering the villages of Bhitthikala, Labji (Jamtipara), Sukri, Ranpur, Salka, Bardohi, and Chithirma .The depth to water levels in these villages varied from 2.0 to &gt;12.0 m bgl. The yields of the wells generally vary from &lt; 1 to 3, and even up to 5 liters per second (lps). The shallow aquifers are found at 1.5 to 21 m bgl.</p> <p>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-m<sup>2</sup>/day to 44- m<sup>2</sup>/day. (CGWB 2012-13).</p>
	Inference	As per ground water resource estimation studies carried out by the Central Ground Water Board (CGWB) in collaboration with the Water Resources Department (WRD), Government of Chattisgarh for the year 2004, the Surguja district is in the safe category
9.	<b>Socio-Economic Status</b>	Primary data was collected from 10 % sample villages and correlated with secondary data.
	Observation	The project area having a total of 67 villages and three town (OG) only in the radial distance of 10 km from the project site.The work participation rate is maximum in the Ambikapur + OG Town (94%) and the minimum is in village Mahavirpura (25.8%); while the average work participation rate is 46.8% 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 (56%); followed by Casual labor work (31%); and Petty Business (7%). It is also observed that about 7% of the population is also engaged in service sector, of which 2% skilled jobs and 5% are engaged in unskilled jobs.Surguja district is industrially not developed. However, growth of agro-based and demand-based units are reported during the decade. The total sanitation Campaign is only restricted in 15.7% of the villages, Untreated tap water in 12.9% of the villages and usage of telephone/mobile is restricted in 10% of the villages, while the presence of Government ITI and PHC/SC are located in just 4.3% of the villages.
	Inference	To initiate literacy program and sanitation system in



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		study area, under Corporate Environmental Responsibility. 40 workers will be required in construction and operation stage. Considering absence of facilities like training centres-ITIs, Sanitation facilities and water supply; proponent has decided to spend total Rs. 5.70 Lakhs in next 5 years as a CER activities which shall include Technical training centres/educational support for government schools, Health care centres/Medical camps and funds for water and sanitation facility, solar lightening and tree plantation activities and Rain water harvesting/ Over head tank for Running Water in 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<sub>x</sub>) 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 an 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 33 % 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



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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 <sub>2.5</sub> ] & [PM <sub>10</sub> ], Sulphur Dioxide[SO <sub>2</sub> ], HCl, Nitrogen Dioxide[NO <sub>x</sub> ] 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, NO <sub>x</sub>	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, O <sub>2</sub> (Or as added in future by CPCB)	On line monitoring (CEMS) connected to CPCB / SPCB server
4.	Work Place Monitoring	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> , 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

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			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 <sub>4</sub> -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 SPCB 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

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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. 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.

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## 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 civil 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

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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.
- HR Manager, Plant incharge 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.