

EXECUTIVE SUMMARY

For

Proposed New Project of Common Bio Medical Waste Treatment Facility (CBMWTF) Consisting of Incineration System having Capacity (1 No. x 250 kg/hr. Static + 1 No. x 300 kg/hr. Rotary), Autoclave having Capacity (2 Nos. x 1000 lit./batch) and Shredder having Capacity (1 No. x 250 kg/hr. + 1 No. x 100 kg/hr.)

At

S.F. No. 248/1 & 246/3A at Kallai Village, Kulithalai Taluk, Karur District, Tamil Nadu – 639110, India.



Applicant:



M/s. Navabuddha Agencies Private Limited
Address: S.F. No. 248/1 & 246/3A at Kallai Village, Kulithalai Taluk, Karur District, Tamil Nadu – 639110, India.

Project:

Total Plot Area: 47,696.91 m²

Project or Activity: As per EIA Notification 2006: 7(da) Common Bio-Medical Waste Treatment Facilities

Sector number: As per NABET Scheme: 32(A)

Category: "B1"

TORs: File No: 12188 dated 14/07/2025

Baseline Monitoring:

Name of Laboratory Pollucare Engineers India Private Limited (Environmental Testing Laboratory)

NABL Accreditation.: Certificate No : TC-7446 (valid till 21/06/2030)

Baseline Monitoring: 1st July, 2025 to 17th September, 2025

EIA Consultant Organization and NABET Accreditation:



ENPRO Enviro Tech and Engineers Pvt. Ltd.

Plot No. D/29/16-17, Hojiwala Industrial Estate, Gate no.3, Sachin Palsana Road, Sachin, Gujarat, INDIA.

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QCI-NABET ACCREDITATION NO. NABET/EIA/EIA/25-28/RA 0388 Valid Upto Jan 11, 2028

1. INTRODUCTION

M/s. Navabuddha Agencies Private Limited is proposing to establish a Common Bio-Medical Waste Treatment Facility (CBMWTF) for the safe collection, transportation, treatment and disposal of bio-medical waste in accordance with applicable environmental regulations. The project will be located at S.F. No. 248/1 & 246/3A at Kallai Village, Kulithalai Taluk, Karur District, Tamil Nadu – 639110. The company will establish advanced medical waste treatment facilities to ensure safe disposal and regulatory compliance. It will provide integrated waste management services tailored for industries, institutions and municipalities. Navabuddha Agencies Private Limited will operate state-of-the-art recycling facilities that will promote circular economy practices and resource recovery. With innovative technologies, the company will minimize ecological impact and maximize sustainability outcomes. All operations will comply with CPCB and MoEFCC guidelines for safe waste handling and treatment. Customized solutions will be designed for hospitals, industries, municipalities, and corporate clients. Sustainability, safety, and compliance will remain the guiding principles of its approach. A skilled team will ensure reliable, efficient, and eco-friendly waste and recycling management services. Navabuddha Agencies Private Limited will be driven by the mission to create a cleaner, greener, and healthier future. The company is promoted by Mr. Pradipta Kumar Rath.

The proposed facility will be equipped with Incineration System having Capacity (1 No. x 250 kg/hr. Static + 1 No. x 300 kg/hr. Rotary), Autoclave having Capacity (2 Nos. x 1000 lit./batch) and Shredder having Capacity (1 No. x 250 kg/hr. + 1 No. x 100 kg/hr.) at S.F. No. 248/1 & 246/3A at Kallai Village, Kulithalai Taluk, Karur District, Tamil Nadu – 639110. The facility will be installed and operated as per Bio-Medical Waste Management Rules, 2016 by MoEFCC.

The proposed new project falls under 7(da), Category “B1” (as all CBMWTF projects fall under “B1” category) as per Schedule of EIA Notification dated 14/09/2006 vide S.O.1142(E) dated 17/04/2015 and its amendments till the date. As the part of EIA procedure, Public Hearing is also required to be carried out for proposed new project as project site is located outside the notified industrial area as per subsection (i) of section III i.e., Public consultation under clause 7(i) of Paragraph 7 in EIA Notification dated 14th September 2006 and subsequent amendments.

2. PROJECT DESCRIPTION

2.1 Need of the Project

Ministry of Environment, Forests & Climate Change (MoEFCC), Government of India, issued the Bio-Medical Waste Management Rules, 2016 (BMW Rules, 2016) on March 28, 2016, to effectively manage bio-medical waste across the country. In accordance to the rule, every occupier of a Health Care Establishment (HCE) shall either set up requisite bio-medical waste treatment facilities on site or ensure requisite treatment of the bio-medical waste at an approved Common Biomedical Waste Treatment Facility. No untreated bio-medical waste shall be kept stored beyond a period of 48 hours. As per the BMW Annual Report 2023 published by Tamil Nadu Pollution Control Board (TNPCB), there is only one existing facility i.e. M/s. Medicare Enviro System exists within the 75 km radius which covers around 31153 beds from Thanjavur, Trichy, Pudukottai, Sivagangai, Ariyalur, Perambalur, Nagapatinam & Tiruvarur districts. Additionally, two more facilities of M/s. Resustainability Healthcare Solutions Ltd. (Formally known as Ramky Energy & Environment Ltd.) is located outside the radius of 75 km and covers around 52620 beds from Karur, Namakkal, Erode, Salaem, Madurai, Dindigul, Virudhunagar, Theni & Govt. Hospitals of Ramnad districts.

Thus, within 75 km radius of proposed project site, the existing facilities are covering more than 80,000 beds.

As per the Revised Guidelines for Common Bio-Medical Waste Treatment and Disposal Facilities – 2016, In case, number of beds is exceeding >10,000 beds in a locality (i.e. coverage area of the CBWTF under reference) and the existing treatment capacity is not adequate, in such a case, a new CBWTF may be allowed in such a locality in compliance to various provisions notified under the Environment (Protection) Act, 1986, to cater services only to such additional bed strength of the HCFs located.

TABLE 1 – DETAILS OF EXISTING TWO FACILITIES NEAR TO THE PROPOSED NEW CBMWTF PROJECT SITE

Sr. No.	Details of the Existing Facility	Districts covered by the Facility	Total Number of beds covered
1	M/s. Medicare Enviro System	Thanjavur, Trichy, Pudukottai, Sivagangai, Nagapatinam, Thiruvarur, Ariyalur and Permabalur	31153
2	M/s. Resustainability Healthcare Solutions Ltd. (Formally known as Ramky Energy & Environment Ltd.)	Salem, Namakkal, Karur and Erode	25810
3	M/s. Resustainability Healthcare Solutions Ltd. (Formally known as Ramky Energy & Environment Ltd.)	Madurai, Dindigul, Virudhunagar, Theni & Govt. Hospitals of Ramnad districts	26810
Total			83773

Source: TNPCB Annual BMW Report, 2023

In view to above, there are sufficient number of beds available in the region. And to comply the condition of BMW Rules, 2016 it is proposed to establish a new Common Bio-Medical Waste Treatment Facility in that region.

TABLE 2 – GAP ANALYSIS: AVERAGE INCREMENT IN BEDS OF EXISTING FACILITY

Sr.No	Existing Facility	Year	Beds covered by existing facility as per TNPCB	Increment in beds	Average Increment in beds
1	M/s. Medicare Enviro System	2019	26101	-	7%
		2020	19044	-27%	
		2021	23560	24%	
		2022	29038	23%	
		2023	31153	7%	
2	M/s. Resustainability Healthcare Solutions Ltd.	2019	24686	-	4%
		2020	20839	-16%	
		2021	21143	1%	
		2022	30392	44%	
		2023	25810	-15%	
3	M/s. Resustainability Healthcare Solutions Ltd.	2019	20457	-	19%
		2020	11650	-43%	
		2021	11802	1%	
		2022	24210	105%	
		2023	26810	11%	

Sr.No	Existing Facility	Year	Beds covered by existing facility as per TNPCB	Increment in beds	Average Increment in beds
Average Incremental Growth in all existing Facility					10%

Source: TNPCB Annual BMW Reports

Considering projection for next 10-12 years and considering development in infrastructure and HCFs, it is expected to increase the number of **Beds by 10 %** each year. In view of 0.277 kg/bed/day as per Revised CBMWTF Guideline, 2025, Waste quantum will also increase by 10 % each year. Waste projection is presented in next slides.

TABLE 3 – PROJECTION OF BIO-MEDICAL WASTE GENERATION DURING NEXT 12 YEARS

Year	Prediction at 10 % increment in Beds	Waste quantum considering 0.277 kg/day/bed as per Revised CBMWTF Guideline
2023	83773	23205
2024	92150	25526
2025	101365	28078
2026	111502	30886
2027	122652	33975
2028	134917	37372
2029	148409	41109
2030	163250	45220
2031	179575	49742
2032	197532	54716
2033	217286	60188
2034	239014	66207
2035	262916	72828

A new CBMWTF would strengthen Bio-Medical Waste management infrastructure, ensuring that waste is treated promptly and effectively. This would help mitigate risks to public health and the environment. Karur's central location and proximity to other nearby developing areas with significant healthcare facilities makes it ideal for a proposed CBMWTF.

2.2 Location & Study Area

New project is proposed at S.F. No. 248/1 & 246/3A at Kallai Village, Kulithalai Taluk, Karur District, Tamil Nadu – 639110. Geographical co-ordinates of the project site are Latitude: 10°47'50.95"N Longitude: 78°27'36.29"E. There are no ecologically sensitive areas like national parks, sanctuaries within 10 km radius of the site.



TABLE 4 – CO-ORDINATES OF PROJECT BOUNDARY

Points	Latitude	Longitude
A	10°47'44.17"N	78°27'40.75"E
B	10°47'47.91"N	78°27'41.85"E
C	10°47'48.52"N	78°27'41.13"E
D	10°47'50.41"N	78°27'29.26"E
E	10°47'54.06"N	78°27'30.63"E
F	10°47'51.59"N	78°27'43.99"E
G	10°47'44.33"N	78°27'41.60"E

2.3 Salient Features of the Proposed New Project:

TABLE 5 – SALIENT FEATURES OF THE PROJECT SITE

Sr. No.	Feature	Details	Approx. Distance from the project site
1.	Geographical Location	Latitude: 10°47'50.95"N Longitude: 78°27'36.29"E	--
2.	Village /City / Industrial Area	Village: Kallai village	Around 1.09 km (E)
		City: Tiruchirappalli	Around 22 km (E)
		Industrial Area: --	--
3.	Nearest Habitant	Kallai village	Around 1.09 km (E)
4.	Nearest Water Body	Mayanur Barrage Right Canal	Around 4.78 km (NE)
5.	Nearest Fire Station	Tiruchirappalli Fire and Rescue Service Station	Around 24.3 km (E)
6.	Nearest Hospital/HCF	G.H Hospital at Wawshuna Village	Around 4.94 km (NE)
8.	Nearby Forest Area	Veeramalai Reserved Forest	Around 12.50 km (SW)
9.	CRZ applicability	Not Applicable	--
10.	Nearest Highway/ Road	SH 71	Around 7.0 km (W)
11.	Nearest Railway station	Pettaivayatalai Railway station	Around 11.75 km (NNE)
12.	Nearest Airport	Tiruchirappalli International Airport	Around 27 (E)
13.	Seismic Zone	Zone-III	--
Applicability of General Condition: Not applicable			
14.	Nearest Critically Polluted Area	Tiruppur	Around 125 km (WNW)
15.	Nearest Interstate Boundary	Tamil Nadu - Kerala	Around 144 km (SW)

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

TABLE 6 – SALIENT FEATURES OF THE PROJECT

Capacity of Proposed New Project:				
Sr. No.	Equipment	Units	Capacity	Total Capacity
1	Incinerator (Stationary)	1	250 kg/hr.	550 kg/hr.
2	Incinerator (Rotary Kiln)	1	300 kg/hr.	
3	Autoclave	2	1000 lit./batch	2000 lit./batch
4	Shredder	1	250 kg/hr.	350 kg/hr.
5	Shredder	1	100 kg/hr.	
6	Effluent Treatment Plant	1	40 KL/Day	40 KL/Day
7	Sewage Treatment Plant	1	5 KL/Day	5 KL/Day
-				
Effluent Treatment Plant		Proposed Actual Flow: 37.7 KLD Proposed Design Capacity of ETP: 40 KLD		
Total Cost of Project		The estimated cost for the proposed project will be Rs. 7.0 Crores.		
Allocation for CER Activities		The project proponent proposes to spend ₹14 Lakh Budget (2 % of total project cost i.e., ₹ 7 Crore) for social development programs.		

	PROPOSED SOCIAL ACTIVITIES <table><tr><th>Activities</th><th>Total</th><th>Responsibility</th></tr><tr><td>Funds allocation for Health</td><td>₹ 4,50,000</td><td rowspan="3">Management and EHS Head</td></tr><tr><td>Funds allocation for Environment and Renewable Energy Resources</td><td>₹ 9,50,000</td></tr><tr><td>Total</td><td>₹ 14,00,000</td></tr></table> FUNDS ALLOCATED FOR PROPOSED ACTIVITIES <table><tr><th rowspan="2">Sr. No.</th><th rowspan="2">Name of the Village</th><th rowspan="2">Proposed Activity</th><th>Unit Cost</th><th rowspan="2">Total Units</th><th>Total Cost</th></tr><tr><th>(Rs.)</th><th>(Rs.)</th></tr><tr><td>1</td><td>Funds allocation for Health</td><td>Arrangement of Medical Health Camps in the village</td><td>₹ 1,00,000.00</td><td>6</td><td>₹ 4,50,000.00</td></tr><tr><td>2</td><td>Funds allocation for Environment and Renewable Energy Resources</td><td>Providing Solar Panel at Kellapatti Government School</td><td>₹ 9,50,000.00</td><td>1</td><td>₹ 9,50,000.00</td></tr><tr><td colspan="5">Total</td><td>₹ 14,00,000.00</td></tr></table> -	Activities	Total	Responsibility	Funds allocation for Health	₹ 4,50,000	Management and EHS Head	Funds allocation for Environment and Renewable Energy Resources	₹ 9,50,000	Total	₹ 14,00,000	Sr. No.	Name of the Village	Proposed Activity	Unit Cost	Total Units	Total Cost	(Rs.)	(Rs.)	1	Funds allocation for Health	Arrangement of Medical Health Camps in the village	₹ 1,00,000.00	6	₹ 4,50,000.00	2	Funds allocation for Environment and Renewable Energy Resources	Providing Solar Panel at Kellapatti Government School	₹ 9,50,000.00	1	₹ 9,50,000.00	Total					₹ 14,00,000.00
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Estimated Manpower Required	Proposed Project will generate direct and indirect employment during construction and operation phase. It is estimated to generate nearly 50 employments on temporary basis during construction phase and 50 employments on permanent basis during operation phase from nearby villages which will help to improve social infrastructure of the surrounding villages.																																				
Area of Land	The Total land area of the site is 47,696.91 m ²																																				
Area of Green-Belt	For the proposed project activities, total allocated land area will be 47967.91 m ² . Out of which, 15923.67 m ² area (33.4%) will be allocated for greenbelt development. There are 3981 trees to be grown in the greenbelt area.																																				
Water Requirement and Waste Water Generation (in KLD)	- <table><tr><th>Sr. No.</th><th>Purpose</th><th>WATER CONSUMPTION (KLD)</th><th>WASTE WATER GENERATION (KLD)</th></tr><tr><td>1</td><td>Domestic</td><td>2.25</td><td>2</td></tr><tr><td>2</td><td>Gardening</td><td>55.8</td><td>0.0</td></tr><tr><td>3</td><td>Industrial</td><td>74.4</td><td>35.7</td></tr><tr><td>(A)</td><td>Incinerator, scrubber, cooling tower make up</td><td>68.0</td><td>30.0</td></tr><tr><td>(B)</td><td>Floor Washing</td><td>2.8</td><td>2.5</td></tr><tr><td>(C)</td><td>Vehicle Washing</td><td>3.6</td><td>3.2</td></tr><tr><td colspan="2">TOTAL</td><td>132.4</td><td>37.7</td></tr></table> -	Sr. No.	Purpose	WATER CONSUMPTION (KLD)	WASTE WATER GENERATION (KLD)	1	Domestic	2.25	2	2	Gardening	55.8	0.0	3	Industrial	74.4	35.7	(A)	Incinerator, scrubber, cooling tower make up	68.0	30.0	(B)	Floor Washing	2.8	2.5	(C)	Vehicle Washing	3.6	3.2	TOTAL		132.4	37.7				
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Source of Water	Required fresh water will be sourced through Local Panchayat Water Supply network. No ground water will be extracted for any of the project activities.																																				
Effluent Treatment:	Wastewater generation will be 37.7 KLD (35.7 KLD industrial + 2 KLD domestic). Out of 132.4 KLD total water requirement, 94.7 KLD water will be																																				

	fresh water and the rest 37.7 KLD water will be recycled water. Industrial effluent (i.e. 35.7 KLD) will be treated into in-house ETP consisting of Primary, Secondary and Tertiary treatment units and recycled back into plant premises for different activities. Domestic sewage (i.e. 2.0 KLD) will be treated into packaged STP plant and recycled back into gardening/flushing activity within premises. So, the entire plant will be designed based on Zero Liquid Discharge (ZLD) technology and no effluent will be discharged outside plant premises or any of the surface bodies.																																												
Power Requirement	Total Power requirement for project will be 500 KVA.																																												
Source of Power Supply	Tamil Nadu Electricity Board (TNEB).																																												
Emergency Power Supply	2 nos. of 250 KVA capacity D.G. set will be installed as back up supply and used only during emergency power backup.																																												
Fuel Requirement	Fuel Consumption for Incinerators LDO/HSD Consumption for Incinerator 1 (250 kg/hr.) – 25 Lit/hr. LDO/HSD Consumption for Incinerator 2 (300 kg/hr.) – 30 Lit/hr. Fuel Consumption for DG set LDO/HSD Consumption for DG Set 2 nos. x 250 kg/hr. – 110 Lit/hr.																																												
Sources of Gaseous Emissions	Process Gas Emissions: Incinerator 1 (250 kg/hr.) - Stack height: 30 m Incinerator 2 (300 kg/hr.) - Stack Height: 30 m Flue gas emissions: Combined stack height of 20 m for DG Set 2 nos. x 250 kg/hr.																																												
Air Pollution Control Measures	For Incinerator 1 (250 kg/hr.): APC system consisting of Gas Quencher, High Pressure Drop Variable Throat Venturi Scrubber, Alkali Scrubber and Activated Carbon Adsorption System along with stack of 30 m Height. For Incinerator 2 (300 kg/hr.): APC system consisting of Gas Quencher, High Pressure Drop Variable Throat Venturi Scrubber, Alkali Scrubber and Activated Carbon Adsorption System along with stack of 30 m Height. Combined stack height of 20 m for DG Set 2 nos. x 250 kg/hr.																																												
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		Machinerie s			
7	Used batteries	--	--	As generated	Sent to Authorized Recyclers
Non-Hazardous Waste					
1	STP Sludge	From STP	--	2.3	Used as Manure in Gardening
2	C&D Waste	Constructio n Activity	--	570360 Kg	Recyclable waste will be reused within plant premises for construction purpose and nonrecyclable waste will be send for MSW landfill site.
3	Municipal Solid Waste - Wet Waste (kitchen waste, food leftovers, fruit & vegetable peels)	From Canteen	--	8	Segregation, Collection, Storage and used as manure for gardening.
4	Municipal Solid Waste - Dry Waste (plastic, paper, metal, glass)	From Stationary, Admin Area etc.	--	6	Segregation, Collection, Storage, transportation and sent to authorized recyclers.
	Sanitary Waste (diapers, sanitary napkins)				Segregation, Collection, Storage, Transportation and sent to authorized municipal agency / incineration facility (CBWTF where applicable).
	Special Care waste (bulbs, batteries, medicines)				Segregation, Collection, Storage, transportation and sent to authorized recyclers.

2.4 Process Description

A. Incineration Plant

Bio-Medical waste incineration involves the high temperature combustion of wastes produced by hospitals, veterinary facilities, and medical research facilities including discarded medicines. The waste, which requires incineration, is stored in yellow non-chlorinated HDPE bags in storage area.

Bio-Medical waste incinerators shall be provided as per CPCB guideline of Bio-Medical waste incinerator.

TABLE 7: DESIGN BASIS FOR PROPOSED INCINERATOR

Capacity	
Total Incineration Capacity:	250 kg/h
	No of Streams: 1 Nos.
	Total Capacity: 250 kg/h
	Total Daily Capacity: 5000 kg
Stationary Incinerator:	Single Stream of 250 kg/h
Design Calorific Value:	Design: 3000 Kcal/kg
Design Feed Capacity:	Design: 250 kg/h
Design Thermal Capacity:	At Design Condition of 250 kg/h at 3000 Kcal/kg, design waste input thermal capacity will be 7,50,000 Kcal/h
Operating Hours:	20 Hours per Day 365 Days per year 7300 Hours per year
Treatment Capacity:	1825 Tons/Annum
Peak Gas Condition:	Combustion chamber, air pollution control System and gas ducts shall be designed to handle gas flow at 30% Peak value which is generated during batch feeding of solid waste, drums into combustion chamber.

❖ TECHNICAL SPECIFICATIONS:

➤ Proposed Incinerator:

Sr. No.	Name	Qty
1	Feed Section	
1.01	Waste Conveyor	1
	Type: Slat / Belt type waste conveyor Capacity: 35-50 Bags / hour, each bag of 5-7 kg weight Bag overall dimension: 450 x 600 x 250 mm Slat conveyor is part of solid waste feed system and will be provided with interlocks and limit switches with counter in synchronization with waste feed system. Power: 3 HP	
1.02	Waste charging hopper with double door arrangement	1
	Type: Rectangular Waste Charging Hopper Operation: Two hoppers operating in alternative sequence Capacity: Hold and transfer 4 bags at a time Dimension: 1 m x 1 m x 2 m each MOC: MS 6 mm thick	

Sr. No.	Name	Qty
	Attachment: 2 Nos of Hydraulically operated door in each hopper Operation: This is part of waste feed system. Slat conveyor will load waste into waste feed hopper. Upper part of waste feed hopper Transfers bag into lower part of waste feed hopper. Once it is transferred to lower part it, upper part door will close. After closing of upper part door, lower part door will open and thus waste will enter to charging duct. In similar sequence second hopper will also operate. Feeding and transfer to feedduct will be in sequential manner through interlock system. The system will consist of hydraulic power pack unit with hydraulic cylinder for doors, limit switches, solenoid valve. Hydraulic power pack system will consist of oil pump with motor rating of 5 HP	
1.03	Furnace Feed Duct with Furnace Door	1
	Type and Description: Waste bags from waste charging hopper will be connected to feed duct. Feed duct shall be directly connected to primary furnace and shall convey bags directly into incinerator. Diameter: 450 mm MOC: CS with refractory lining / SS304 Cooling: Air cooling in Jacket. Jacket air is directly injected into Furnace Door Primary Furnace is provided with Refractory lined slide Door, operated by hydraulic system. Door will remain in open condition in normal operating condition. Feed system can be isolated by closing this door. Dimension: 600 mm x 600 mm MOC: MS with refractory lined on one sideOperation: Through Hydraulic System	

Sr. No.	Name	Qty
2	Incineration Section	
2.1	Primary Combustion Furnace	1
Type:	Vertical Stationary Type provided with grating at bottom for waste combustion, ash door at bottom for removal of ash after incineration of waste	
Duty:	To incinerate hazardous solid waste at temperature of 800+°C. Furnace is designed to withstand 1500 °C Temperature (Not for continuous operation)	
Dimensions:	Furnace Part	
	Shell ID	2 m
	Clear ID	1.5 m
	Shell Clear Length	2.5 m
	Shell Length	3.0 m
Gas Flow Rate	Design Gas Flow Rate: 7280 m ³ /h at 948 °C (refer, heatand mass balance for design condition)	
Volume for Combustion	Furnace Volume: 4.41 m ³	
Flue Gas Retention Time:	2 seconds at design flow	
Ash Removal System	Ash shall be discharged through bottom portion of the furnace through ash door	
MOC:	Shell: MS 6 mm thick Protection Lining: 225 mm thick total.	

	Top layer shall be fire brick and shall be able to with stand 1100 °C temperature.
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2.2	Post Combustion Chamber (Secondary Furnace)	1
Type:	Stationary Vertical type.	
Duty:	To provide post combustion for the incineration gas from the furnace to achieve complete combustion/destruction of organics at 1050 °C and also to provide minimum 2 sec retention time to the flue gas. Lining should be capable of withstanding 1500 °C operating temperature.	
Dimensions	Diameter Shell / Clear	2.00 m / 1.50 m
	Length Shell / Clear	3.7 m / 3.2 m
Gas Flow Rate	Design Flow Rate: 9560 m ³ /h at 1100 °C	
Volume for Combustion	Effective volume: 5.66 m ³	
Flue Gas Retention Time	2 seconds.	
MOC:	Shell: MS 6 mm thick Protection Lining: 225 mm thick total. Top layer shall be Fire Brick and shall be able to withstand temperature of 1500 °C	

2.3	Oil Burner 1 for Primary Furnace	1 + (1 Spare)
Type	Pressure atomized type fuel oil burner with complete with burner management system.	
Duty	To carry out combustion in Primary Combustion Furnace to maintain desired temperature.	
Description of Operation	In primary combustion furnace incineration of waste is carried out at 800 °C. Since the waste is having its own calorific value, it also provides heat required for maintaining temperature in the furnace. Fuel oil burners shall be used for initial heat of furnace and also to provide back up support to maintain temperature in the furnace. Burner shall be two stage step control type and it will operate automatically using temperature indicator and burner control panel.	
Fuel	LDO, GCV of Fuel Considered 11000 kcal/kg.	
Burner Capacity	Design 30 kg/h	
Primary Air	For Startup and operation: Air Temperature 35 °C Burner nozzles should be suitable for 1200 °C furnace temperature.	
Actual Consumption	Operating NIL based on high GCV waste	
Burner Management System	Burner should be provided with Fuel Oil Pump (1 working and 1 standby) Burner Fan Air to fuel ratio controller Flame failure device and temperature controller. Interlock with Ram Feed Device Safety Interlocks Electrical Panel Electrical Heating System for Oil Day Tank and Oil Piping considering LDO	

2.4	Oil Burner 2 for Post Combustion Chamber	1 + (1 Spare)
Type	Pressure Atomized type fuel oil burner with complete with burner management system.	
Duty	To carry out combustion in Secondary Furnace to maintain 1100 °C temperature.	

Description of Operation	Flue gas from primary combustion furnace shall be of 800 °C. These gases are required to heat up to 1100 °C in secondary furnace with the help of fuel oil burner. Burner shall be modulating type and it will operate automatically using temperature indicator and burner control panel.
Fuel	LDO, GCV of Fuel Considered 11000 kcal/kg
Burner Capacity	Design 30 kg/hr.
Primary Air	For Startup and operation: Air Temperature 35 °C Burner nozzles should be suitable for 1200 °C furnace temperature.
Actual Consumption	As per heat and mass balance based 20 kg/h
Burner Management System	Burner should be provided with Fuel Oil Pump (common for both burners, 1 working and 1 standby) Burner Fan Air to fuel ratio controller Flame failure device and temperature controller. Interlock with Ram Feed Device Safety Interlocks Electrical Panel Electrical Heating System for Oil Day Tank and Oil Piping considering LDO

2.5	Emergency Vent valve and Stack	1
	Emergency Vent Valve will be provided on top of post combustion chamber adequate to handle load of pressurized gases. Type: Pneumatically actuated butterfly valve Action: Open and close through feedback from pressure transmitter (Air Fail to open) Dimension: 100 mm Dia, 1 Nos MOC: Body CI, Disc: SS316	

2.6	FD Fan	1
Type	Horizontal, Centrifugal	
Qty	2 Nos (1 Operating + 1 Standby)	
Duty	To provide secondary air for combustion in primary combustion chamber.	
Capacity	Design: 2500 kg/h (2000 Nm ³ /h)	
Suction Head	Ambient	
Discharge Head	350 mmwcg	
Fluid	Air at 40 °C and 80 % RH	
MOC:	Casing: MS Impeller: MS Shaft: EN8	
Drive:	Direct drive attached with VFD.	
Blower Efficiency	70%	
Motor Rating	7.5 HP	

3	Air Pollution Control System	
3.1	Venturi Scrubber (Variable Throat)	1
Type:	Variable throat type Venturi scrubber	

Duty:	To quench hot gases from gas quencher to saturation temperature, remove particulate matter and partially scrub HCl gas at high velocity invariable throat.
Operating Parameter	Gas Inlet Temperature: 1100 °C Outlet Gas Temperature: 78 °C Liquid to Gas Ratio: 0.003 m ³ /m ³ (Outlet Condition) Throat Velocity: 60 m/s Allowable Pressure Drop: 450 mmwc, Max
Dimensions:	Venturi Scrubber Inlet Diameter: 650 mm Throat Diameter: 400 mm Throat length: 400 mm Outlet Diameter: 650 mm Top Length: 1250 mm Bottom Length: 1750 mm Total Length: 3000 mm
Liquid Injection:	Liquid Flow rate: 10 m ³ /h Type: Through Peripheral Injection Nozzle, Low Pressure Type MOC: SS316
MOC:	Venturi Body: SS316
Venturi Scrubber Circulation Tank	Circulation Tank: Capacity: 5 m ³ MOC: MS (6 mm thick) with Epoxy Coating
Venturi Scrubber Circulation Pump	Type: Horizontal Centrifugal PumpQty: 2 Nos Capacity: 10 m ³ /h Head: 20 MLC Motor: 3 HP MOC: Casing CI, Impeller SS316Seal: Mechanical Seal

3.2	Alkali Scrubber	1
Type:	Counter Current Packed Bed Tower	
Duty:	To scrub gaseous pollutants in the counter current circulation of alkali solution through packing.	
Operating Parameter	Gas inlet flow rate:4800 m ³ /h Gas Inlet Temperature:78 °C Outlet Gas Temperature:78 °C Liquid Inlet flow rate:40 m ³ /h	
Dimensions:	Scrubber Diameter:1000 mm Packed Height (Wet):3000 mm Total Height:4500 mm Packing Type:50 mm PP Pall Ring MOC:MS (6 mm thick)	
Mist Eliminator:	Chevron Type MOC: Contact parts in FRP	
Liquid Distributor:	Qty:1 Type: Header and Lateral Type MOC: FRP / HDPE	
Alkali scrubber Circulation Tank	Circulation Tank: Capacity: 10 m ³ Dimension: 2.5 m x 2.5 m x 1.8 m MOC: MS (8 mm thick)	

Alkali scrubber Circulation Pump	Type: Horizontal Centrifugal Pump Qty: 2 Nos Capacity: 40 m ³ /h Head: 20 MLC Motor: 5 HP MOC: Casing CI, Impeller SS316 Seal: Mechanical Seal
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3.3	Activated Carbon Column	1
Type:	Down flow packed column	
Duty:	To adsorb skipped VOCs or organic compounds in Incinerator flue gas on Activated Carbon	
Operating Parameter	Gas Flow: 2500 Nm ³ /h (3000 m/h) Gas Inlet Temperature: 70 °C	
Design Criteria	Approach Velocity: 2 m/s	
Vessel Dimension	Diameter: 800 mm, Contact Height: 3000 mm Vessel Height: 4500 mm	
Media	Granular Activated Carbon with Iodine Value 900 min.	
MOC	Vessel and Support Plate: MS with Rubber Lining	

3.4	ID Fan	2 (1+1)
Type	Horizontal, Centrifugal	
Qty	2 Nos (1 Operating + 1 Standby)	
Duty	To overcome system pressure, drop and to pull the gas through the system and to vent to atmosphere through stack	
Inlet Temperature	75 °C	
Capacity	Design:	3000 Nm ³ /h
Suction Head	-750 mmwgc	
Discharge Head	+50 mmwgc	
Differential Head	800 mmwc	
Fluid	Wet Gas Operating Temperature 75 °C max.	
MOC:	Casing: MS with Rubber lining Impeller: SS316 Shaft: SS	
Drive:	20 HP Motor with VFD drive	

3.5	Alkali Solution Storage and dosing Tank and dosing Pump	1
	Alkali Solution Storage Tank Qty: 1 No Type: Vertical cylindrical tank Capacity: 2000 Liters MOC: MS with epoxy painted Alkali Solution dosing Pump Qty: 2 Nos Type: Mechanical Positive Displacement Pump Capacity: 50 LPH Head: 20 MLC MOC: All contact part in SS316 Motor: 1 HP	

3.6	Stack	
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	Type: Self Supported Stack Gas Flow: 2500 Nm ³ /h / 3000 Am ³ /h Stack Diameter: 400 mm at top (Combined for 2 streams) Stack Height: 30 m from ground level Stack MOC: MS with Epoxy Paint	
4	Utilities	
4.1	Fuel Oil storage Tank with Tanker unloading and transfer pump	1
	Fuel Oil Storage Tank Qty: 1 No Type: Vertical cylindrical tank Capacity: 5000 Liters Tanker Unloading Pump Qty: 1 No. Type: Horizontal Centrifugal Pump Capacity: 5 m ³ /h Head: 15 MLC Motor: 2 HP MOC: Casing: CS, Impeller: CS Seal: Mech Seal	
4.2	Drain Pit	1
	Type: Underground RCC Rectangular Tank with top slab Duty: To Collect Feed Section area floor spillages in tank Capacity: 5 m ³ MOC: RCC with Epoxy Painted Note: To provide Top slab with adequate ventilation.	
4.3	Drain Pit Pump	1
	Type: Horizontal Centrifugal Pump, Self-Priming, Non-Clog Type Duty: To Transfer Spillages in Feed Section to Liquid waste feed tank. Capacity: 5 m ³ /h Head: 20 MLC Motor: 2 HP MOC: Casing: CS, Impeller: SS316	

5	Ducting, Piping and Valve			1
Duct from	Duct to	Type	MOC	Lining
Primary Furnace	Secondary Furnace	Circular	MS	Refractory lining (Operating Temperature °C) 1100
Secondary Furnace	Venturi Scrubber	Circular	MS	Refractory lining (Operating Temperature °C) 1100
Ventry Scrubber	ID Fan	Circular	MS	Rubber lining / FRP Lining, Operating Temperature 70-90 °C
ID fan	Stack	Circular	MS	Rubber lining / FRP Lining
Process Air		Circular	MS	No Lining

Fluid	Temperature	MOC
Scrubber Liquor circulation	65-95 °C	HDPE/PPR
Scrubber Liquor	<65 °C	HDPE/PPR
Fuel Oil		MS
Process water		MS/UPVC

Wastewater		HDPE / UPVC
Caustic Lye		MS

6	Plant Structure, shed, ladder, supports and all civil work			1 set
Name of CivilWork	Purpose	Overall Dimension	More Details	
MCC, PLC Room, Operator Room, UPS Room	For Housing MCC Panel, PLC Panel, for Incinerator Plant with operator room	10 m x 5 m x 4.5 m high with suitable isolation wall and Concrete ceiling	-	
Civil foundations of plant and machinery	As required for foundation of plant and machinery	As required		
Plant Shed and Roof	Complete plantshed and roof for plant and machinery	As required, divided into high bay and low bay area	Weather protection roof with side louvers / covers shall be provided	

7	Instrumentation inclusive of field instrumentation, PLC based SCADA system, Terminals with computer and printer, Instrumentation panel, automation			1 set
	<u>INSTRUMENTATION</u> Bio-Medical waste incineration plant Incineration Plant shall be provided with instrumentation system consisting of following components. Field Instruments with local indications Field instruments with transmitters and switches attached to PLC based SCADA system for plant controls, monitoring and data recording Instruments will be provided for monitoring of pressure, temperature, flow and levels. For the control of operating parameters logics will be incorporated in PLC based SCADA system and set points of the controlling parameters can be altered from the control room. PLC based SCADA system shall be incorporated with alarms and emergency shutdown features in case of process disturbance. Necessary electrical transducers will be provided to monitor the bus voltage, current, frequency, power and energy as part of electrical distribution system. These transducers will also be connected to the plant control system. Online monitoring system shall be provided as under Flue gas monitoring for PM, O₂, CO₂ and CO measurement at the outlet of Stack Gas as per CPCB guideline Online pH meter for scrubber solutions. CCTV camera with monitors in control room at critical locations in the plant.			

8	Electrical with electric motors, cables, PCC Panel, MCC panel, VFD panel, VFDs			1 set
	<u>ELECTRICAL:</u> The voltage levels in the proposed plant will be at 415 V, 50 Hz for 3 phase and 240 V for single phase and 110 V ac for control supply requirement. There will be centralized MCC room for Incineration plant from where power will be fed to all drives of the plant. The MCC shall be fixed type cubicle, vermin proof with standard			

	fuses, relays and indication lamps. Weatherproof start – stop push button stations shall be provided near each motor for local start stop control Necessary power and control cables running from MCC to motors and back shall be provided. The cables shall conform to relevant Indian standards. All motors shall be of standard design, TEFC construction, and Class F insulation. All drives above 50 HP shall be provided with VFDs as power saving option and for better plant control.
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Operating Condition

Incinerator is designed to comply with operating standards as per CPCB Guidelines, mainly

TABLE 8 - OPERATING CONDITION FOR INCINERATION SYSTEM

Standards
Combustion Efficiency (CE) shall be at least 99% and shall be computed as follows: $CE = \% CO_2 \times 100 / (\% CO_2 + \% CO)$
Temperature of primary chamber shall be at least 800 °C (± 50 °C)
Secondary chamber gas residence time shall be at least 2 (two) seconds at 1050 °C (± 50 °C) with minimum 3% Oxygen in the stack gas
For cytotoxic waste 1200 (± 50 °C) in secondary chamber
TOC content of bottom ash/slag shall be less than 3 % Or LOI content of bottom ash/slag shall be less than 5 % on dry basis.
In general Incinerator will be designed as per CPCB guideline

Further detailed process description and Technical Specifications of Incinerator are provided in EIA report.

B. Autoclave

TABLE 9 – TECHNICAL SPECIFICATION OF EXSITING AUTOCLAVE

Sr. No.	Description	Specification
1	Type	Single Hinge Door, Horizontal Cylindrical, Automatic Standard Vacuum Pump with Condenser, provided along with long with SS Carriage & Trolley
2	Capacity	No of Cycle per Day: 16 Nos Total Capacity: 500 kg/batch
Working parameter		
1	Chamber Working Pressure	1.06 kg/cm ² .
2	Jacket Working Pressure	1.5 kg/cm ² .
3	Chamber Working Temperature	120 to 135 °C
4	Residence Time	60 Min. for Autoclaving
Overall Dimensions		
1	Type	Horizontal Cylindrical
2	Capacity	250 kg/autoclave per batch
3	Waste Density Considered	250 kg/m ³
4	Inside Volume of Autoclave	1000 Liters

Sr. No.	Description	Specification
5	Overall Dimensions	1.1 m dia x 1.0 m length (Inside clear) (Dim subject to change as per manufacturer standard)
6	Ground space required	2 m x 3 m for each autoclave Front 2 m space for loading and unloading into /from autoclave
Hydro Test		
1	Chamber	One & half time the working Pressure
2	Jacket	Twice the Working Pressure
Material of Construction		
1	Chamber and Back plate	The Sterilizing Chamber is fabricated from S.S.304 Quality with full argon welding.
2	Jacket	The jacket is fabricated from M.S Quality
3	Insulation	Resin Bonded Rock wool insulation of 50mm thickness
Instruments		
1	Temperature	Thermocouple (0-200°C) range 1 No on main chamber 1 No on Jacket Temperature gauge Local: 1 No on Chamber

❖ Proposed Design Basis:

Capacity	
No of streams	: 2 Nos.
Capacity of each autoclave/stream	: 1000 Lit/Batch
Total Capacity	: 2000 Lit/Batch
No. of batches	: 16 Nos/Day/Autoclave
Time required per batch	: 1 hr. 30 min
Operating hours considered	: 24 hrs./Day
Operating Conditions	
Operating Pressure	: 2 BAR
Operating Temperature	: 121°C to 125°C

Further process description and Technical Specifications of Autoclave are provided in EIA report.

C. Shredder

TABLE 10 – TECHNICAL SPECIFICATION OF EXISTING SHREDDER

Sr. No	Description	Specification
Shredder Machine for Plastic Waste		
1	General	
	Type of Waste	Treated Plastic Waste

Sr. No	Description	Specification
	Capacity (Kg/hr)	250 kg/hr.
	No of Machines	1
	Feeding Condition	Batch Feeding of treated Bio-Medical Wastes
	Max. working hours	20 Hrs.
	Operating Cycle	Intermittent
2	Shredder	
	Blades	Shear Type
	No. Of Blades	5 Moving Blades & 2 Stationary Blades
	Motor Power	40HP
	MOC of Blades	Alloy Steel
	MOC casing	MS
	Feeding Mechanism	Manual
Shredder Machine for Metal Waste		
1	General	
	Type of Waste	Bio-Medical Waste like Glass, Syringe, Needles etc.
	Capacity (Kg/hr.)	100 Kg/hr.
	No of Machines	1
	Feeding Condition	Batch Feeding of treated Bio-Medical Wastes
	Max. working hours	20 Hrs.
	Operating Cycle	Intermittent
2	Shredder	
	Cutting Chamber	Cutting chamber shall have 2 Nos. rotating Shafts. Shafts will be made of High Strength Alloy Steel Designed to avoid frequent damages & failure. Shaft will be fitted with Heat – treated Cutters of Alloy Steel designed for Medical waste. Unit shall be fitted with removable Cleaning Fingers to avoid wrapping of Material around Shaft. It will also have Bearing & Oil Seal Protection from processing Material. It will have a lid at the top of hopper which will be fitted with limit switches to prevent starting of machine when the lid is open
	No of Shafts	2 Nos., Hexagonal Shaft
	No of Cutter	24 Nos. on each shaft
	Motor Power	30 HP (15 HP x 2 Nos.)
	MOC of Shaft and Cutter	High strength Alloy Steel
	MOC casing	MS
	Feeding Mechanism	Manual

❖ Shredder Details:

Capacity	
No of Streams	: 2 Nos
Capacity of each Shredder/stream	: 250 kg/hr. x 1 no. and 100 kg/hr.
Operation	: Semi continuous
Operating hours	: 24 hrs. per day

Further process description and Technical Specifications of Shredder are provided in EIA report.

3. Description of Environment

Baseline environmental status in the study area was studied for the various environmental attributes, as delineated in TOR, during **1st July 2025 to 17th September 2025** at different locations, including the project site. The water (surface and ground), soil, air and noise samples have been collected and analysed by NABL accredited and MoEFCC recognized laboratory M/s. Pollucare Engineers India Private Limited (Environmental Laboratoryy). All the samples were collected, preserved and analysed as per the standard procedures / methods.

Sr. No.	Environmental Attributes	Baseline Status
1.	Ambient Air Quality	8 stations - at near project site & within the study area
	Observation -	PM ₁₀ : 42.50–73.30 µg/m ³ PM _{2.5} : 21.38–45.70 µg/m ³ SO ₂ : 8.77-19.64 µg/m ³ NO _x : 14.11-33.80 µg/m ³ NH ₃ : 3.8-9.6 µg/m ³ O ₃ : 9.60-19.99 µg/m ³
	Inference	All results (average) were found within NAAQS permissible limits.
2.	Meteorological Status	Meteorological data for period of 1st July 2025 to 17th September 2025 was collected by NABL accredited laboratory M/s. Pollucare Engineers India Private Limited (Environmental Laboratoryy).
	Observation	South West Monsoon Season Pre-dominant wind – W to E Calm condition– 4.6 % Average wind speed – 9.7 m/s. Temperature range – 24.0 °C to 39.0 °C Relative Humidity range – 35.1 % to 100.0 %
	Inference	Ideal Condition for Habitats.
3.	Water Quality	Surface water samples were collected from 8 different sources – 1) Project Site 2) Perur Udayappatti Pond 3) Puthur Pond 4) Mayanur Barrier Right Canal 5) Keelaveliyur Lake 6) Kavalkaranpatti 7) Sivayam South Pond 8) Meghamalai Pond Ground water samples were collected from bore wells at 8 different locations – 1) Project Site 2) Kallai 3) Perur Udayappatti 4) Vengatampatti 5) Bullpatti 6) Thalinji 7) Purasampatti 8) Thogaimalai

Sr. No.	Environmental Attributes	Baseline Status																																																															
	Observation	Surface water: Results with respect to CPCB Water Quality Criteria																																																															
		<table><tr><th>Stn. Code</th><th>pH</th><th>DO (mg/L)</th><th>EC at 25 °C, µS/cm</th><th>BOD (mg/L)</th><th>Total Coliform (MPN/100 mL)</th><th>Water Quality as per CPCB Class</th></tr><tr><td>SW1</td><td>7.14</td><td>4.60</td><td>349</td><td>11.30</td><td>23</td><td>D</td></tr><tr><td>SW2</td><td>7.33</td><td>5.10</td><td>185</td><td>8.24</td><td>22</td><td>D</td></tr><tr><td>SW3</td><td>6.49</td><td>3.80</td><td>153</td><td>20.70</td><td>40</td><td>D</td></tr><tr><td>SW4</td><td>6.88</td><td>5.50</td><td>580</td><td>6.12</td><td>23</td><td>D</td></tr><tr><td>SW5</td><td>8.07</td><td>5.70</td><td>272</td><td>2.28</td><td>30</td><td>B</td></tr><tr><td>SW6</td><td>7.44</td><td>5.10</td><td>690</td><td>15.20</td><td>23</td><td>D</td></tr><tr><td>SW7</td><td>7.62</td><td>5.30</td><td>582</td><td>10.13</td><td>30</td><td>D</td></tr><tr><td>SW8</td><td>7.45</td><td>5.80</td><td>491</td><td>2.19</td><td>22</td><td>B</td></tr></table>	Stn. Code	pH	DO (mg/L)	EC at 25 °C, µS/cm	BOD (mg/L)	Total Coliform (MPN/100 mL)	Water Quality as per CPCB Class	SW1	7.14	4.60	349	11.30	23	D	SW2	7.33	5.10	185	8.24	22	D	SW3	6.49	3.80	153	20.70	40	D	SW4	6.88	5.50	580	6.12	23	D	SW5	8.07	5.70	272	2.28	30	B	SW6	7.44	5.10	690	15.20	23	D	SW7	7.62	5.30	582	10.13	30	D	SW8	7.45	5.80	491	2.19	22	B
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1	GW1	53.4	Poor																																																														
2	GW2	49.4	Good																																																														
3	GW3	55.4	Poor																																																														
4	GW4	55.9	Poor																																																														
5	GW5	57.3	Poor																																																														
6	GW6	50.8	Poor																																																														
7	GW7	51.6	Poor																																																														
8	GW8	55.4	Poor																																																														
-																																																																	
	Inference	Surface water:																																																															
		Surface water quality assessment indicates that locations SW5 and SW8 meet CPCB Class B criteria, reflecting comparatively good water quality suitable for outdoor bathing, with dissolved oxygen levels above 5 mg/L, low BOD concentrations, and controlled coliform counts. Locations SW1, SW2, SW3, SW4, SW6, and SW7 fall under CPCB Class D, indicating water quality suitable for propagation of wildlife and fisheries. The classification is primarily influenced by relatively higher BOD levels and lower dissolved oxygen concentrations at some locations, suggesting the presence of moderate organic pollution. The observed organic load may be attributed to domestic runoff, agricultural activities, and natural decomposition of organic matter. However, no evidence of industrial contamination was observed, and the overall water quality remains adequate for supporting aquatic ecosystems and designated Class D uses. Ground water: The groundwater quality results (GW1–GW8) indicate that the groundwater is generally free from toxic metal and organic contamination; however, certain physico-chemical parameters exceed desirable drinking water limits. The pH (7.22–7.91) remains within the acceptable range prescribed under IS 10500:2012. Total Dissolved Solids (1200–1382 mg/L) and Total Hardness (850–983 mg/L) are elevated, indicating highly mineralized and very hard groundwater, although values remain within																																																															

Sr. No.	Environmental Attributes	Baseline Status																																		
		the permissible limits in the absence of an alternate source. Chloride (355–479 mg/L), sulphate (118–160 mg/L), nitrate (10.1–12.4 mg/L), and fluoride (0.11–0.16 mg/L) are within permissible limits, suggesting no significant contamination from anthropogenic sources. Heavy metals such as arsenic, lead, mercury, chromium, selenium, nickel, and other trace elements were below detectable limits in all samples, indicating the absence of industrial pollution. However, microbiological analysis revealed the presence of E. coli (22–70 CFU/100 mL) and total coliforms (40–90 CFU/100 mL) in all samples, indicating bacteriological contamination and rendering the groundwater unsuitable for direct drinking without disinfection. Overall, the groundwater quality is characterized by high hardness and TDS of geogenic origin, with no evidence of heavy metal contamination, but requires appropriate treatment prior to potable use due to microbial contamination.																																		
4.	Noise Quality	Noise levels were measured at 8 locations in study area including project site																																		
	Observation	The monitored ambient noise levels in the study area ranged from 60.7–71.6 dB(A) during daytime and 47.8–59.8 dB(A) during nighttime. Most locations exhibited noise levels within the CPCB prescribed standards. Marginal exceedances were noted at the project site and Thalinji, reflecting the influence of existing transportation corridors, and localized human activities. The noise environment in the remaining locations was found to be satisfactory, indicating that ambient noise conditions are generally under control within the study area.																																		
	Inference	All results were within CPCB permissible limits.																																		
5.	Soil Quality	Soil samples were collected from 8 locations of study area including project site.																																		
	Observation	pH ranged from 7.63 to 8.12 The Organic matter ranged from 1.35% to 1.88%																																		
	Inference	Overall, the soil quality in the study area is satisfactory, with good physicochemical characteristics and no evidence of heavy metal contamination. The baseline soil conditions are suitable for supporting vegetation growth and do not indicate any significant environmental concerns.																																		
6.	Land Use / Land Cover	The Satellite IRS P-6 LISSR2 images are obtained from National Remote Sensing Centre (NRSC) Hyderabad. Land use / land cover mapping was carried out for 10 km radius area with project site at centre.																																		
	Observation	<table><tr><th>Sr. No.</th><th colspan="2">LULC Level 1&2 Classifications</th><th>Area (Ha)</th><th>Area (%)</th></tr><tr><td>1</td><td>WaterBodies</td><td>River / Streams</td><td>3668.31</td><td>12%</td></tr><tr><td>2</td><td>Agriculture Land</td><td>Cultivated Land</td><td>8880.44</td><td>28%</td></tr><tr><td>3</td><td>Built-up</td><td>Urban/Rural</td><td>6866.75</td><td>22%</td></tr><tr><td>4</td><td>Wastelands</td><td>Scrub Land</td><td>3112.00</td><td>10%</td></tr><tr><td>5</td><td>Agriculture Land</td><td>Plantation</td><td>4110.00</td><td>13%</td></tr><tr><td>6</td><td>Wastelands</td><td>Stone quarry</td><td>1810.00</td><td>6%</td></tr></table>	Sr. No.	LULC Level 1&2 Classifications		Area (Ha)	Area (%)	1	WaterBodies	River / Streams	3668.31	12%	2	Agriculture Land	Cultivated Land	8880.44	28%	3	Built-up	Urban/Rural	6866.75	22%	4	Wastelands	Scrub Land	3112.00	10%	5	Agriculture Land	Plantation	4110.00	13%	6	Wastelands	Stone quarry	1810.00
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Sr. No.	Environmental Attributes	Baseline Status				
		7	Wastelands	Rocky nob	1210.00	4%
		8	Built-up	Industria area	2100.00	7%
		Total			31757.50	100%
		-				
	Inference	Land Use Land Cover classification is clearly that the area is covered with Agricultural Cultivable land around 28 % respectively of the total area. which is taken up for cultivation but is temporarily allowed to rest, cropped for one or more season, but not less than one year. Thus, total cultivable land is 28 %. Other class is Roads within the study area 18%, Around the Fallow edges the Settlement (Built-up area) is located and occupies around 10%, and. It is an area of human habitation developed due to non-agricultural use and that has a cover of buildings, transport and communication, utilities in association with water, vegetation and plantation. The proposed project is on Agricultural Cultivable land and does not have any significant impact on the surrounding villages and habitation. The water bodies cover 12% of the total area. The water bodies cover Napali River etc.				
7.	Ecology and Biodiversity	Biological assessment of the site was done to identify whether there are any rare, endangered, endemic, threatened (REET) species of flora or fauna within the study area (proposed site boundary to 10 km radius). The entire study area divided into three major zones, The proposed project site area, the core zone which considered to be high impact area (project site boundary to 5 km radial distance) and the buffer zone (core zone boundary to 10 km radial distance) which considered to be moderate impacted area. The study also designed to identify impacts and suggest suitable mitigation measures. A reconnaissance survey randomly made for one day for proposed unit and surrounding buffer area during Summer season 2026. The floral and faunal survey has been conducted during day time (Morning 9 am to 5 pm) and Avian survey has been conducted in selected locations during dawn (early morning 5.30 am to 7.30 am) and in dusk (evening 5.00 pm to 6.30 pm) depends on light intensity. General interviews made with local people on seasonal migratory birds, animal corridors and Ethno botanical knowledge and recorded in field data sheets. No physical damage created to flora and fauna during data collection.				
	Observation	The vegetation growth is similar in all sampling points with good diversity and all tree species are abundantly present with good evenness. The forest species are open scrub. The secondary data from forest department and other publications revealed that there are few rare and endangered species at district level. The primary data collected during the site visit and interaction with local public reveals that there are no such species in the vicinity of study area. The natural vegetation statistically not surveyed by any researchers in the study area (No specific surveys conducted or published from the study area). Hence the present data collected in the study area is cross verified with local people and forest department. No single tree species is predominant throughout the study area and randomly distributed represents good undisturbed ecosystem. Due to fragmented ecosystem, the faunal movement will not enter in the				

Sr. No.	Environmental Attributes	Baseline Status
		proposed project site and hence there will be no habitat stress for any faunal species. No migratory routes for birds and other faunal aspects.
	Inference	The base line study for evaluation of the flora and fauna biodiversity of the terrestrial environment of the study area was carried out within 10 km radius of the project site. The core zone habitat upto 5km area is mostly covered with semi urban and rural vegetation. The predominant trees in the study area is primarily characterized by tropical dry thorn and dry deciduous forest types, with a mix of native and invasive species. This zone is having good number of trees, shrubs and herbs in open vegetation. The predominant species present in the open vegetation area are <i>Leucaena leucocephala</i> , <i>Azadirachta indica</i> , <i>Mimosops elengi</i> , <i>Pithecellobium dulce</i> , <i>Samanea saman</i> , <i>Alstonia scholaris</i> , <i>Millettia pinnata</i> , <i>Tectona grandis</i> , <i>Dendrocalamus strictus</i> , <i>Dalbergia sissoo</i> are mainly restricted to waste and cultivable waste lands. The faunal composition generally with arboreal and semi arboreal based animals. Within the core zone common mongoose, Squirrels are sighted apart from few reptilian species. From the secondary source (local people working in the plant), it is also revealed that presence of common snakes exists here.
8.	Geology	Crystalline rocks of Archaean age occupy >90% of the area. Recent alluvium occurring in the area is of fluvial origin and restricted to the course of rivers and major systems. The hard rock terrain comprises of predominantly of Charnockite and Khondalite groups, and their Migmatitic derivatives, and supracrustal sequences of Peninsular Gneissic Complex occurring as granites and gneisses intruded by ultramafic-mafic complexes, basic dykes, granites, gneisses and syenites. The fluvial deposits occur along the Cauvery River and its stream courses (GSI, 2006).
	Hydrology	Ground water occurrence, movement and recharge to aquifers are controlled by the degree of weathering, fracture pattern, geomorphological setup and rainfall. Charnockites, Granites and Gneisses of peninsular gneissic group constitute major aquifers in the area. Ground water occurs in phreatic condition in the weathered zone and under semi-confined condition in the fractured and jointed rock formations. Ground water occurs under phreatic conditions in the weathered zone and under semi-confined conditions in the fractures. The thickness of weathered zone varies from less than a metre to about 15 m in the area depending on the topography. Potential aquifer zones are also developed in these rocks by fractures persisting to depths, particularly along lineaments and their inter sections. The depth of dug wells in crystalline formations varies from 8 – 19.5 meters below ground level (m bgl). The depth of the bore wells in the area varies from 50 to >120 m, and even some were drilled down to 200 m. Fracture zones have been encountered in the well down to a depth of 116 m bgl in the borehole drilled by Central Ground Water Board (CGWB).
	Inference	In collaboration with the state departments, Central Ground Water Board (CGWB) carried out ground water resource estimation and categorization studies for the Karur District for the year 2008-09. The CGWB has categorized the area as 'over exploited' with the stage of ground water utilization of 63 %, indicating further scope for further ground water development. These details are applicable to the study area also, as it is

Sr. No.	Environmental Attributes	Baseline Status
		forms part of this district. There is notable canal command irrigation in the area. The irrigation is carried through the use of water from percolation tanks, water bodies, and bore wells. The area is regionally characterised by dendritic drainage, with a general slope towards Cauvery River. Major part of the pediment-inselberg-hilly complex in the area is dissected by streamlets flowing towards the ponds or gradually joining the Cauvery River. Out of the small and medium size tanks and water bodies situated in the area have seasonal and limited irrigation facilities.
9.	Socio-Economic Status	The primary data were collected from the selected number of villages within the 10 km of the study area.
	Observation	The study area, covering a 10 km radius around the proposed project site, comprises predominantly rural settlements located in the Kulithalai Taluka of Karur District and adjoining areas of Tiruchirappalli District. The villages identified within the study area include Kallai, Kanur, Gudalur, Thalinji, Alathur, Kalladai, Inungur, Sivayam (North & South), Neidalur (North & South), Pappakappatti, Hiranyamangalam, Puthur, and several surrounding habitations. The social structure of the area reflects the typical rural characteristics of Tamil Nadu, with agriculture being the primary occupation. The study area population is characterized by a predominantly rural social structure with moderate growth trends. Average household size in the region ranges between 4 and 5 persons per family. The population within the study area mainly consists of Hindu communities, along with smaller populations of Muslims and Christians living in social harmony. Scheduled Castes (SCs) are present in most villages, whereas the Scheduled Tribe (ST) population is comparatively negligible. Both joint and nuclear family systems exist in the area; however, nuclear families are gradually increasing due to socio-economic changes and migration for employment and education.
	Inference	The socio-economic assessment indicates that the study area is predominantly rural with agriculture-based livelihoods and gradually improving infrastructure facilities. The proposed CBMWTF project is expected to: • Improve scientific biomedical waste management • Generate direct and indirect employment • Support local economic growth • Enhance community infrastructure through CER activities With proper environmental safeguards, regulatory compliance, and implementation of mitigation measures, the project is not expected to cause any significant adverse socio-economic impacts in the surrounding villages.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1. Impact identification matrix has been developed by establishing cause-effect relationship between activities of project and environmental attributes.
2. The waste water from the CBMWTF is collected in effluent collection tank cum equalization tank and subjected to flash mixer and flocculator followed by primary settling tank. Waste water from primary settling tank subjected to biological treatment. Treated waste water reused is passed through pressure sand filter and activated carbon filter and the filtered water to be reused as scrubbing media in incinerator scrubber. Sludge from effluent treatment plant will be sent to TSDF site.
1. Incinerator gas emissions will be treated in Air Pollution Control System consisting of Gas quencher, High PD Variable Throat Venturi Scrubber and Packed Bed Scrubber for removal of Particulate Matter (PM). Carbon adsorption column is also proposed to capture any unwanted gases like dioxin and furan. Modelling of pollutant emission (PM, HCl, NO_x) was carried out using AERMOD to assess incremental ground level concentration within 10 km radius study area. Incremental ground concentration was found insignificant in study area after implementation of mitigation measures. Incremental Maximum Ground Level Concentration for each parameter along with distance and direction are mentioned below:

TABLE 7 – INCREMENTAL MAXIMUM GROUND LEVEL CONCENTRATION

Sr. No.	Parameters	Maximum GLC (µg/m ³)	Distance and Direction
1	PM	0.38	400 m away in E direction from Project
2	HCl	0.38	400 m away in E direction from Project
3	NO _x	3.19	400 m away in E direction from Project

2. Incinerator Ash and ETP sludge are hazardous solid waste generated from plant. They will be stored in packed form in dedicated hazardous waste storage area and then disposed to TSDF site. Disinfected plastic and glass will be sent to authorized recyclers. Disinfected and shredded sharps shall be sent to metal recovery or to TSDF site for disposal. Used oil and used batteries will be sent to recyclers. Recyclable portion of C&D waste will be reused within plant premises for construction purpose and non-recyclable part of waste will be sent to MSW Landfill Site). Thus, there is negligible impact on soil.
3. There are no reserved forests within the study area.
4. Insignificant effect on ecological environmental and geology and hydro-geology aspects is predicted due to adequate control measures for effluent management, emission control and solid waste management.
5. DG Sets is provided for power failure condition. All utilities will be provided with acoustic enclosure to mitigate noise generation during operation. ETP blowers will be provided with acoustic enclosure to mitigate noise generation during operation. The health impacts of increased noise level on workers within plant premises will be further mitigated by provision of PPEs and shift management.
6. Risk assessment study has been conducted for the proposed new project and the suggestions made in the report shall be implemented strictly to prevent any chances of environmental contamination and employee health and safety. By the efficient implementation of Hazard/Risk control/Prevention measures the negative impacts would be avoided.

5. ENVIRONMENTAL MONITORING PROGRAMME

The environmental monitoring program is prepared for Ambient Air, Stack Gas, Effluent, Soil, ground water and Surface water, Noise for effective monitoring of the environmental conditions to ensure that EMP is implemented efficiently to prevent/minimize the anticipated impacts.

6. ADDITIONAL STUDIES

6.1 Hazard Identification, Risk Assessment and Mitigation Measures

Identification of hazards at the project site indicates the characteristics of hazardous wastes that pose potential for an emergency situation. Hazard Identification involves systematic identification of all possible sources of hazards associated with handling, storage, transportation, treatment, and disposal of Bio-Medical Waste (BMW). The objective is to recognize conditions that may lead to accidents, emergency situations, or environmental and health impacts.

At the proposed facility of **M/s. Navabuddha Agencies Private Limited**, the following categories of hazardous/bio-medical waste will be handled:

- Waste generated from hospitals and healthcare units
- Waste from veterinary institutions
- Waste from medical and research laboratories

These wastes comprise:

- **Infectious waste** (e.g., contaminated dressings, cultures, blood samples)
- **Pathological waste** (human tissues, organs, body parts, placenta)
- **Sharps** (needles, syringes, scalpels)
- **Pharmaceutical waste** (expired drugs, cytotoxic/anti-neoplastic agents)
- **Chemical waste** (disinfectants, solvents, alcohols)
- **Heavy metals** (e.g., mercury-containing waste)
- **General non-hazardous waste**

Hazard Characteristics

The above wastes possess one or more of the following hazardous properties:

- Infectious nature
- Toxicity
- Corrosivity
- Reactivity
- Flammability

Improper handling, storage, or accidental release (spill/leak/fire) of such wastes can lead to:

- Health hazards (infection, toxicity)
- Environmental contamination (air, soil, water)
- Fire and explosion risks

At M/s. Navabuddha Agencies Private Limited looking to the nature and types of activities, A Hazard Identification and Risk Assessment (HIRA) methodology will be adopted for qualitative evaluation.

Many times a Risk involved in various processes / process equipments cannot be addressed completely by Consequence Analysis. As a conservative approach, these risks have been considered

separately under this topic. The approach is to identify hazards involved in operational activities like handling of wastes and related equipment, working in storage areas, working in incinerator area, transportation, loading and unloading of wastes, etc., assessing its impacts, ranking the risk posed by it and finally to propose remedial actions/mitigation measures such that the risk is minimized to tolerable level.

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

- Hazardous Solid Waste transportation from generation site to Bio-Medical Waste Treatment Facility (M/s. Navabuddha Agencies Private Limited)
- Weighing and Sampling of Waste
- Incineration
- Autoclave
- Shredding

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.

CBMWTF staff will be trained for safe handling of ETP chemicals and operation of treatment units. All personnel working at CBMWTF will be provided with necessary Personnel Protective Equipment (PPEs). Periodical medical check-up shall be done for all employees at least twice 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 new 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 new project is expected to yield a positive impact on the socio-economic environment. It helps to sustain the development of this area including further development of physical infrastructural facilities. 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.

Moreover, project proponent proposes to spend **₹14 Lakh** Budget (2 % of total project cost i.e., ₹ 7 Crore) for social development programs under Corporate Environment Responsibility (CER) activities in nearby villages.

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, autoclave.

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 company will formulate Environment Management Cell after inception of activities of proposed project and after completion of necessary employments. With vision to improve the efficiency of EMC and to operate the planned EMP requirements as suggested in the present chapter, Cell has to be formed for efficient and easy operation of environment management system and operations thereof.

The major duties and responsibilities of Environmental Management Cell will be as given below:

- To ensure continuous compliance with Environmental Clearance (EC), Consent to Establish/Operate (CTE/CTO), and applicable environmental rules and regulations.
- To plan, implement, and monitor pollution control measures related to air emissions, wastewater, solid and hazardous waste, noise, and greenbelt development.
- To identify, record, investigate, and report all environmental accidents, near-miss incidents, abnormal emissions, effluent exceedances, spills, leakages, equipment failures, and unsafe environmental conditions within the plant premises.
- To conduct regular environmental monitoring, internal audits, and performance reviews, and implement corrective and preventive actions based on findings.
- To ensure timely reporting and coordination with statutory authorities, including submission of compliance reports, environmental statements, and incident notifications, wherever applicable.

9. CONCLUSION

Considering the potential impacts of the proposed new project, M/s. Navabuddha Agencies Private Limited has prepared adequate remedial measures and an Environmental Management Plan for their implementation. Overall, the proposed new project will generate employment opportunities as well as increase in physical resources. Similarly, M/s. Navabuddha Agencies Private Limited has planned to implement various CER activities to create a thriving environment. It can be concluded that strict adherence to mitigation measures during the construction and operational phases will result in negligible impact on the environment. Proposed new project will be helpful to maintain hygienic conditions in the local region by treating BMW in scientific way as per BMW guidelines.