DRAFT EIA/EMP REPORT

w.r.t.

COMMON BIO-MEDICAL WASTE TREATMENT FACILITY

at

Plot no. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 65,566,567, Tehsil/Thana-Gondia, District-Dhenkanal, Odisha

Project Proponent:

M/s MKD Eco Clean Pvt. Ltd.

BASELINE MONITORING PERIOD: OCT, 2024 TO DEC, 2024

Schedule: 7(da), Common Biomedical Waste Treatment Facility, Category: B1

Environment Consultant:

Grass Roots Research & Creation India (P) Ltd.

(Accredited by QCI/NABET, GoI & ISO 9001:2015 Certified Co.)

Vide letter no. NABET/EIA/24-27/RA 0354

Validity of Accreditation till August 16, 2027

F-374-375, Sector-63, Noida, U.P.

Ph.: 0120- 4044630, Telefax: 0120- 2406519

MKD ECO CLEAN PRIVATE LTD

CIN No: U32509OD2023PTC044035

Plot no 143/3933, IHB Colony Po-Sisupalgarh, Bhubaneswar -751002

Ph-0674-3161342, M-6370094363 Email mkdecoclean@gmail.com

Date: 26.03.2025

To
The Member Secretary,
Odisha State Pollution Control Board (OSPCB),
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII,
Bhubaneswar – 751012, Odisha

Sub.: Submission of Draft EIA/EMP report w.r.t Common Bio-Medical Waste Treatment Facility Project at Plot No.553/1081, 555,556, 557, 559, 560, 561, 562, 563, ,655, 566, 567, Khata no. 123/124, Mauja- Asanbahali Tehsil/Thana Gondia, District: Dhenkanal, Odisha by M/s MKD Eco Clean Pvt. Ltd.

Sir,
With reference to the above cited subject, Environment Clearance is in process and Terms of Reference has been granted by SEIAA, Odisha vide File No- 498744/54-INFRA2/10-2024, Dated 24.03.2025.

The Draft EIA/EMP report has been prepared for conducting public hearing as per the EIA Notification dated 14th September 2006 and amendments till date. We are herewith submitting the following documents both in hard copy as well as in soft copy as below:

- Draft EIA/EMP Report along with necessary annexures.
- Executive Summary of the report in English and Odiya.

As per the slab, Public Hearing fee worth INR 1,50,000 has been submitted vide applicant ID AY23-24/415391558311 dated 26.03.2025.

We kindly request you to expeditiously process our project for conducting the public hearing.

Thanking you,

For M/s MKD Eco Clean Pvt. Ltd.

MKD ECO CLEAN PVT. LTD.

Lipsit Dash

DIRECTOR

Name: Lipshit Dash

Designation: Director

Encl: As stated

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UNDERTAKING

(As per OM No:- J.11013/41/200/IA-II (I) Dated: - 05-10-2011 by MoEFCC, New Delhi, Govt. of India)

I, Lipshit Dash Managing Director of **M/s MKD Eco Clean Pvt. Ltd.,** give this undertaking to the effect that conditions laid down in ToR's prescribed by SEIAA, Odisha vide File no. 498744/54-INFRA2/10-2024 date 24.03.2025 for Common Biomedical Waste Treatment and Disposal Facility (CBWTF) in the state of Odisha of 7250 kg/day capacity by M/s MKD Eco Clean Pvt. Ltd. The Project is proposed to be located at Plot No.553/1081, 555,556, 557, 559, 560, 561, 562, 563, ,655, 566, 567, khata no. 123/124, Mauja- Asanbahali Tehsil/Thana Gondia, District: Dhenkanal, Odisha have been complied in the draft EIA report.

In order to assess the likely impacts of the proposed project M/s MKD Eco Clean Pvt. Ltd . authorities have entrusted M/s GRC India Pvt Ltd, Noida to facilitate in the process of Environmental Impact Assessment [EIA] for various environmental attributes which are likely to be affected and to prepare a detailed Environmental Management Plan (EMP).

Information and data on Project Technical Details, Land, Water, Fuel, Pollution Mitigation Measures, Stack Details, Project Cost Project, layout Plan and location Maps used in this EIA Report have been given by M/s MKD Eco Clean Pvt. Ltd. EIA Report is approved by M/s MKD Eco Clean Pvt. Ltd.

We hereby submitting undertaking on 27.03.2025 as per OM No: J.11013/41/2006/IA-II (I), dated: - 05-10-2011 that the contents and information submitted in this EIA report is owned by M/s MKD Eco Clean Pvt. Ltd. EIA report fully complies with all the points mentioned in ToR's prescribed by SEIAA, Odisha. The data submitted in this EIA Report is true and factually correct.

For M/s **MKD Eco Clean Pvt. Ltd**

MKD ECO CLEAN PVT. LTD.

Lipsit Dash

DIRECTOR

Name: Lipshit Dash

Designation: Director

Annexure – VII

Declaration by Experts contributing to the EIA report of "Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 565,566,567, Tehsil/Thana-Gondia District - Dhenkanal, Odisha by M/s MKD Eco Clean Private Limited". (Category - B Project as Per EIA Notification 2006)

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA coordinator: Mr. Bijendra Srivastava

Signature and Date:

Period of involvement: October 2024 to February 2025

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and date
1	AP*	Dr. Dhiraj Kr. Singh Mr. Sonu	Oct 2024 to Dec 2024	
2	WP*	Ms. Mudita Tomar Singh Mr. Saurabh Gola	Oct 2024 to Feb 2025	
3	SHW*	Dr. Dhiraj Kr Singh	Oct 2024 to Feb 2025	
4	SE*	Mr. Rajiv Rastogi	Oct 2024 to Dec 2024	
5	EB*	Dr. Ashok Kumar Rathoure Ms. Kavita Chopra	Oct 2024 to Feb 2025	
6	HG*	Prof. Tapan Majumder	Oct 2024 to Dec 2024	
7	GEO*	Prof. Tapan Majumder	Oct 2024 to Dec 2024	
8	SC*	Mr. Ashok Srivastava	Oct 2024 to Dec 2024	
9	AQ*	Ms. Mudita Tomar Singh Mr. Sonu	Oct 2024 to Jan 2025	
10	NV*	Dr. K.L. Satapathy	Oct 2024 to Dec 2024	

11	LU*	Mr. Punit Lal Mahato Mr. Devendra Kumar	Oct 2024 to Dec 2024	Punit Lal Mahato Devendra Kr
12	RH*	Mr. S.K. Bandhopadhya	Oct 2024 to Dec 2024	

*One TM against each FAE may be shown
**Please attach additional sheet if required

Declaration by the Head of the accredited consultant organization/ authorized person

I, Dr. Dhiraj Kr. Singh hereby, confirm that the above-mentioned experts prepared the EIA of Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 565,566,567, Tehsil/Thana- Gondia District - Dhenkanal, Odisha by M/s MKD Eco Clean Private Limited.

I also confirm that EIA Coordinator (EC) has gone through the report, and the consultant organization shall be fully accountable for any misleading information.

It is certified that no unethical practices, plagiarism involved in carrying out the work and external data / text has not been used without proper acknowledgement while preparing this EIA report.

Signature:

Name: **Dr. Dhiraj Kr. Singh**

Designation: **Managing Director**

Name of the EIA consultant organization: **Grass Roots Research & Creation India (P) Ltd**

NABET Certificate No. & Issue Date: **NABET/EIA/24-27/RA 0354 dated:- 11.11.2024 and valid till:- 16.08.2027.**

CERTIFICATE OF PLAGIARISM CHECK

Title of EIA Report:	Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 56 0, 561, 562, 563, 565,566,567, Tehsil/Thana-Gondia District - Dhenkanal, Odisha by M/s MKD Eco Clean Private Limited
Name of Accredited Organization:	M/s GRC India Pvt. Ltd, Noida
Unique Identification Number:	GRC/EIA/Feb-24/01
Name of EIA Coordinator:	Mr. Bijendra Srivastava
Name of the Software:	Plagiarism Checker X
Date of Check:	28.02.2025
Time of Check:	2:00 PM

EIA Co-ordinator:

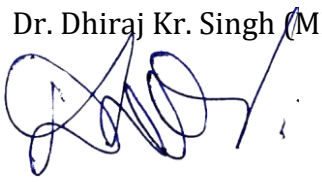
Name : Mr. Bijendra Srivastava

Signature :

Head of ACO / authorised person:

Name : Dr. Dhiraj Kr. Singh (MD)

Signature :



Name of the EIA Consultant Organization: M/s GRC India Pvt. Ltd, Noida, 201301

NABET Certificate no. & Issue date: NABET/EIA/24-27/RA 0354 dated Nov 11, 2024 valid till Aug 16, 2027.

*Note – The ACO may use / take help of appropriate software to detect plagiarism issues of the EIA content.

Plagiarism Checker X - Report

Originality Assessment

15%

Overall Similarity

Date: Feb 20, 2025 **Matches:** 5127 / 33227 words **Sources:** 134

Remarks: Low similarity detected, check with your supervisor if changes are required.

TERMS OF REFERENCE – POINT-WISE COMPLIANCE
File No 498744/54-INFRA2/10-2024 Dated: 24.03.2025

ToR file No. 498744/54-INFRA2/10-2024 Dated: 24.03.2025 under Schedule 7(da), Category "B1" for Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 56 0, 561, 562, 563, 565,566,567 tehsil/thana-Gondia District. Dhenkanal, Odisha. Copy attached as **Annexure-I.**

S. No.	ToR Point	Reply	Citation
1.	**Project Details**		
1.1.	Importance and benefits of the project.	The Common Biomedical Waste Treatment Facility (CBWTF) ensures safe, compliant disposal of healthcare waste, protecting public health and the environment. It offers cost-effective solutions for healthcare facilities, reduces pollution, prevents disease transmission, promotes sustainable practices, and creates job opportunities, contributing to improved healthcare and waste management standards.	--

1.2.	Reasons for selecting the site with details of alternate sites examined/rejected/selected on merit with comparative statement and reason/basis for selection. The examination should justify site suitability in terms of environmental damages, resources sustainability associated with selected site as compared to rejected sites. The analysis should include parameters considered along with weightage criteria for short-listing selected site.	M/s MKD Eco Clean Pvt Ltd has proposed a Common Bio-Medical Waste Treatment and Disposal Facilities for waste generated in a radius of 75 km. The facility will certainly address the problems being faced by HCFs in handling their BMW as well address the issue of EHS being faced by the HCF workers, staff, doctors and public.	--
1.3.	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The estimated project cost is INR 1.8 Crore. The capital cost for environment management plan including CER will be INR 1.8 Lakh and recurring cost will be INR 0.5 Lakh.	Item No - 2.1 in Chapter # 2 of EIA Report at Page No. 20.
1.4	Details of various waste management units with capacities for the proposed project. Details of utilities indicating size and capacity to be provided.	Details of waste management is given in item no. 4.5 in Chapter-4 of EIA report at Page no. 110	Item no. 4.5 in Chapter-4 of EIA report at Page no. 110.

1.5	List of waste to be handled and their characteristics. Details of temporary storage facility for storage of Bio-medical waste at project site.	Biomedical waste which is to be handled are; Human Anatomical Waste, Animal Anatomical Waste, Soiled waste Expired or Discarded Medicines Chemical Waste, Chemical Liquid Waste Microbiology, Biotechnology and other Clinical laboratory waste sharps including Metals, Glassware, Metallic Body Implants. The source of these waste will be the HCF's (Health common Facilities). These waste will be segregated as per the color coding and will be transported through fully covered dedicated Vehicle.	--
1.6	Other chemicals and materials required with quantities and storage capacities.	There will be no hazardous chemicals which will be required. Only Diesel which will be used as fuel for incinerator will be stored at the premises. Total quantity of 240 Lit/hr will be required and will be stored with storage capacity of 500 liters.	Table No- 7.1 in Chapter # 7 of EIA report at Page No. 131.
1.7	Detailed design of pre-treatment and waste stabilization facility of Biomedical waste.	Pre-treated waste will be received from the HCF's as pre-treatment is done at HCF level. After receiving of the pre-treated bio-medical waste, it will be treated with the Autoclave and Incinerator and the ash generated from the incinerator will be sent to the TSDF site for landfilling while the waste from autoclave will be segregated and shredded and afterwards it will be sent to the recyclers/manufacturers.	--

1.8	Project proponents would also submit a write up on how their project proposal conform to the stipulations made in the Bio-Medical Waste Management Rules, 2016, notified by the MoEF&CC on 28th March, 2016.	Write up on how their project proposal conform to the stipulations made in the Bio-Medical Waste Management Rules, 2016 is attached as **Annexure-VI.**	**Annexure- VI.**
1.9	Process description along with major equipment and machineries, process flow sheet (quantitative) from Bio-Medical waste material to disposal to be provided.	Pre-treated waste will be received from the HCF's as pre-treatment is done at HCF level. After receiving of the pre-treated bio-medical waste, it will be treated with the Autoclave and Incinerator and the ash generated from the incinerator will be sent to the TSDF site for landfilling while the waste from autoclave will be segregated and shredded and afterwards it will be sent to the recyclers/manufacturers.	--
1.10	Details of man-power requirement (regular and contract).	During Construction phase the labors and workers will be hired mostly from nearby areas. Total employment for the operation phase will be 60 including support staff, skilled and unskilled workers.	Item No. – 2.2, Table No. 2.1 in Chapter # 2 of EIA Report at Page No. 20.
1.11	A detailed layout of the project site indicating all the project components.	Detailed Plant Layout has been mentioned in the EIA report indicating storage area, plant area, greenbelt area, utilities etc. Site layout is enclosed as **Annexure-VII.**	**Annexure VII.**

<table>
<tr>
<td>1.12</td>
<td>At the time of conducting EIA, the capacity of the incinerator may be fixed according to the availability of raw material within the location as per the different capacities of incinerator prescribed in the guidelines on CBMWF,2016 issued by CPCB in this regard.</td>
<td>
<table>
<tr><th>Name of equipment</th><th>Rated Capacity</th><th>Operational hr/day</th><th>Remarks</th></tr>
<tr><td>Incinerator</td><td>1*400 kg/hr & 1*500 kg/hr</td><td>16</td><td>Installed separately for process in Yellow Colour bag for BMW</td></tr>
<tr><td>Autoclaves</td><td>0.50 m^3</td><td>16</td><td>Installed separately for process in Red, White, Blue Colour bag for BMW</td></tr>
<tr><td>Shredders</td><td>400 kg/hr</td><td>10</td><td>For Shredding from autoclave/ disinfected wastes</td></tr>
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</td>
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<tr>
<td>2.</td>
<td colspan="3">Road And Traffic</td>
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<tr>
<td>2.1</td>
<td>Submit the details of the road/rail connectivity along with the likely impacts and mitigative measures</td>
<td>NH-53 which is at 6.5 km in ENE and Kashipur-Nihalprasad Road is at 1.3 km in South direction from the project site. The nearest railway station is Jenapur Railway Station at 10.3 km towards ENE</td>
<td>Item No - 2.3. in Chapter # 2 of EIA Report at Page No. 21.</td>
</tr>
</table>

		from the project site. Nearest airport to the project site is Biju Patnaik International Airport at a distance of 64.0 km towards SSW from the project site.	
2.2	Examine the details of transportation of Bio-Medical wastes, and its safety in handling.	The Bio-medical waste shall be transported from the HCFs in containerized vehicles. The BMW shall be packed by HCFs in Non Chlorinated plastic bags by HCFs. These packed bags shall be placed inside the drums which shall be properly covered and then placed in the vehicle to ensure the safety during transportation. The drums shall be taken out of vehicle after reaching at site and properly stored before their treatment as per BMWM Rules.	Chapter # 7, Table-7.1 of EIA Report at Page No. 131.
3.	**Land Environment**		
3.1	Detailed soil analysis of the site including its permeability, water holding capacity be included.	Soil sampling report is attached as **Annexure- III.**	**Annexure- III**
3.2	Submit the present land use and permission required for any conversion such as forest, agriculture etc	CLU permission is under progress. Land document is attached as **Annexure- VIII**	Item No – 2.4 in Chapter # 2 of EIA Report at Page No.25. **Annexure- VIII.**

3.3	Specify the land area and space allotted for each activity proposed within the facility. The area requirements for each activity shall be calculated as per the CPCB guidelines for the specified activity.	Detailed Plant Layout has been mentioned in the EIA report indicating storage area, plant area, greenbelt area, utilities etc.	Item no. 2.4 in Chapter- 2 of EIA report at Page no. 26.
3.4	Status of the land purchases in terms of land acquisition Act. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	Land is owned by MKD Eco Clean Pvt Ltd and documents regarding the same is attached as **Annexure- VIII.**	**Annexure- VIII.**
3.5	The EIA would address to the conformity of site to the stipulations as made in the Bio-Medical Waste Management Rules, 2016 and Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and will have a complete chapter indicating conformity to the said rules. NOC shall be obtained from State Pollution Control Board/Committee (SPCB/SPCC) regarding site suitability for establishment of Bio-Medical Waste Treatment Facilities.	We will submit the same at the time of Final EIA report.	--
3.6	Post project reclamation management program with financial allocation.	Not applicable	--
4.	**Environmental Monitoring And Management**		

4.1	Examine and submit the details of online pollutant monitoring.	Monitoring report of study area is attached as **Annexure-III.**	**Annexure-III.**
4.2	Project proponent must ensure Good Combustion Practice (GCP) to reduce the possibilities of formation of 'Total dioxins and furans'. In addition, GCP must be coupled with appropriate End-of-the-pipe treatment at low temperature to reduce the emission of 'Total dioxins and furans' below the standards. Further, the project proponent must provide detailed Standard operating procedure (SOPs) for sampling and monitoring of 'Total dioxins and furans'.	Standard operating procedure (SoPs) for sampling and monitoring of 'Total dioxins and furans' is attached as **Annexure-IX.**	**Annexure- IX.**
4.3	Environmental Management Plan should be accompanied with Environmental Monitoring Plan and environmental cost and benefit assessment. Regular monitoring shall be carried out for odour control	Environmental monitoring has been proposed to be conducted on periodical basis as per the requirement of the CPCB/SPCB requirements and for the same budget has been allocated in the Environment management plan with capital cost of Rs 1.8 lakhs and recurring cost of Rs 0.5 lakhs.	Chapter # 6, Table 6.2 of EIA Report at Page no. 128. Chapter # 10 of EIA Report at Page NO. 160.
4.4	Water quality around the landfill site shall be monitored regularly to examine the impact on the ground water.	The waste will be sent to the TSDF site for landfill. No landfill will be done at the proposed project site. The Groundwater shall be monitored twice a year after commissioning of CBWTF. The water quality observed presently is as under: **Ground Water Quality** The pH values observed were in the range of 7.08 to	Item No. – 3.6, Table No. 3.6 & 3.8 in Chapter # 3 of EIA Report at Page No. 59-70.

		7.67 ; with total dissolved solid ranging from 430 mg/l to 4 8 7 mg/l. Total Hardness was in the range of 1 6 7 mg/l to 223 mg/l. The concentration of alkalinity was in the range of 227 to 276 mg/l.	
4.5	Air Quality Index shall be calculated for base level air quality.	The maximum PM10 concentration of 85.7 µg/m^3 was observed at Crusher Mine area Near Project site (AAQ-3) and minimum value of 63.8 µg/m^3 was observed at Mahulakhali Village (AAQ-6). The average values were observed to be in the range of 70.5 to 78.3 µg/m^3 and the 98% tile was observed by in the range of 76.7 to 84.0 µg/m^3 A maximum value of 47.4 µg/m^3 was observed at Crusher Mine area Near Project site (AAQ-3) and minimum value of 31.6 µg/m^3 was observed at Near Tentol Village (AAQ-2). The average values were observed to be in the range of 39.1 to 43.0 µg/m^3 and the 98% tile was observed by in the range of 42.4 to 47.4µg/m^3 The highest NO_2 level of 18.4 µg/m^3 at M.s jay Jagannath stone crusher Near Site (AAQ-4) and minimum value of 8.2 µg/m^3 observed at Mahulakhali Village (AAQ-6). The average values were observed to be in the range of 11.7 to 14.5 µg/m^3 and the 98% tile was observed by in the range	Item No. 3.5, Table No. 3.3 & 3.4 in Chapter # 3 Page No. 54-58.

		of 15.2 to 18.3 µg/m^3 SO_2 levels peaked at 9.9 µg/m^3 at Nihal Prasad Village (AAQ-8) and minimum value of 4.7 µg/m^3 observed at Near Tentol Village (AAQ-2). The average values were observed to be in the range of 6.6 to 8.3 µg/m^3 and the 98% tile was observed by in the range of 8.2 to 9.8 µg/m^3. CO concentrations ranged from 530 µg/m^3 at Crusher Mine area Near Project site (AAQ-3) and minimum value of 240 µg/m^3 observed at Bali Pasi Village (AAQ-7). The average values were observed to be in the range of 355 to 444 µg/m^3 and the 98% tile was observed by in the range of 451 to 530 µg/m^3.	
4.6	Baseline data on Ground water quality is required.	The waste will be sent to the TSDF site for landfill. No landfill will be done at the proposed project site. The Groundwater shall be monitored twice a year after commissioning of CBWTF. The water quality observed presently is as under: **Ground Water Quality:** The pH values observed were in the range of 7.08 to 7.67 ; with total dissolved solid ranging from 430 mg/l to 4 8 7 mg/l. Total Hardness was in the range of 1 6 7 mg/l to 223 mg/l. The concentration of alkalinity was in the range of 227 to 276 mg/l.	Item No. – 3.6, Table No. 3.6 & 3.8 in Chapter # 3 of EIA Report at Page No. 59-70.

4.7	Possible carbon footprint contribution from each activities and mitigation measures proposed shall be included as part of Environment Management Plan.	Carbon footprint study report will be submitted at the time of Final EIA report.	--
5.	**Waste Management**		
5.1	Examine and submit details of the proposed odour control measures.	Odor is a characteristic or quality of a substance that makes it perceptible to the sense of smell. Experts defines odor as "the perception experience when one or more chemicals come in contact with the receptors on the olfactory nerves and 'stimulate' the olfactory nerve." This definition is useful as it points out that odor is not a chemical or group of chemicals, but instead the human body's reaction to and perception of one or more chemicals (odorants). Biomedical waste management facilities can generate odors due to purification under specific conditions. For effective odor management. it is to eliminate objectionable odors by reducing the frequency, intensity, duration, and offensiveness of odors that people/workers may experience. Offensive odors may emanate from several sources, including handing, storage of biomedical waste material which may be decomposed significantly prior to treatment in incineration and autoclaving. **Odor Control Measures** Good housekeeping and timely treatment preferably within 24 hrs. will greatly reduce general site smell	Item No – 10.2 in Chapter # 10 of EIA Report at Page No. 159.

		and reduce impact from odor which could lead to complaint from the local community, workers at site, and site users. Good practice includes; a. Storage of waste in a confined area. b. Speedy treatment and disposal of waste. c. Regular Cleaning of areas of waste storage with d. detergents / spraying odor control chemicals e. Consideration of prevailing wind direction while planning location of facility. Plantation of Fragrances generating flowering trees.	
5.2	The storage and handling of Bio-Medical wastes shall be as per the Bio-Medical Waste Management Rules, 2016.	Will be complied.	Item No – 4.1 in Chapter # 7 of EIA Report at Page No. 101.
5.3	Details of storage and disposal of pre-processing and post-processing rejects/inerts and products. List of proposed end receivers for the rejects/inerts/products should be provided. MoUs to be submitted in this regard.	MoU regarding disposal of pre-processing and post-processing rejects/inerts and products will be submitted at the time of Final EIA.	--
5.4	Details of hazardous/solid waste generation and their management.	Noted please. The same shall be very strictly complied with.	Item No – 7.2.2 in Chapter # 7 of EIA Report at Page No. 131.
6.	**Water Environment**		
6.1	Detailed hydro-geological studies and possible impact if any accidental contamination occurs shall be included.	Hydro-geological study report will be submitted at the time of Final EIA report.	--

6.2	Examine and submit details of monitoring of water quality around the landfill site.	**Ground Water Quality:** **Ground Water Quality** The pH values observed were in the range of 7.08 to 7.67 ; with total dissolved solid ranging from 430 mg/l to 4 8 7 mg/l. Total Hardness was in the range of 1 6 7 mg/l to 223 mg/l. The concentration of alkalinity was in the range of 227 to 276 mg/l. **Surface Water Quality** The p H values observed were in the range of 7.73 to 7.83 with total dissolved solids in the range of 190 mg/l to 410 mg/l. BOD were observed less than 12 mg/l. Chloride varied between 36 mg/l & 89 mg/l. Sulphates varied from 18 to 36 mg/l, Nitrate varied from less than 1.1 to 3.5 mg/l.	Item No. – 3.6, Table No. 3.6 & 3.8 in Chapter # 3 of EIA Report at Page No. 59-70.
6.3	Examine and submit details of impact on water body and mitigative measures during rainy season.	There will not be any impact on water bodies due to the proposed project during rainy season or otherwise also since it is a zero liquid discharge unit. The whole of rainfall within the site shall be managed within the plant itself. Proper utilization of rainwater shall be made by harvesting by appropriate rainwater harvesting mechanism. Based on the rainfall intensity of the plant area, storm water drainage system will be designed and constructed. Strom water drainage system consisting of well-designed network of open surface drains with check dams at appropriate distances to improve the infiltration efficiency of the rain water into ground	--

		shall be made so that all the storm water is efficiently drained off without any water logging.	
6.4	Details of Drainage of the project up to 5 km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided.	Details of Drainage of the project up to 10 km radius of study area is given in EIA report. Site is not within 1 km radius of any major river.	Figure No-3.1 in Chapter # 3 of EIA report at page No. 52.
7.	**Water Management**		
7.1	Details of effluent treatment and recycling process.	An ETP of 10 KLD capacitywill be established to treat the scrubbed water, floor washings and other wastewater from the plant and recirculated the treated water into the scrubber (APCD) as well as utilized in the greenbelt development making the system as zero discharge system.	Item No- 2.5.4.4 in Chapter # 2 of EIA report at Page No. 33
7.2	A certificate from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.	CGWA NOC has been obtained from competent authority and copy of the same is attached as **Annexure-X.**	**Annexure-X**
8.	**Energy Management**		

8.1	A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project.	Will be submitted at the time of Final EIA.	--
9.	**Disaster Management Plan**		
9.1	Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.	A comprehensive Disaster Management Plan has been provided in the EIA report including the precautionary measures which should be taken while evacuation. Regular mock drills will be carried out to create awareness on procedures to be followed in times of emergency situation/ evacuation	Item No – 7.2.7 in Chapter # 7 of EIA at Page No. 138.
9.2	Hazard identification and proposed mitigation measures.	Hazards identification and proposed safety systems have been detailed in chapter-7 of the EIA report.	Item No-7.2.2 in Chapter # 7 of EIA report at page No. 131.
10.	**Green Belt**		
	A detailed Plan for green belt development.	The landscape plan will be submitted during Final EIA report.	--
11.	**Socioeconomic Environment**		
11.1	Public hearing to be conducted for the project in accordance with provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the SEIAA, Odisha and	Noted	--

	not on the basis of Minutes of the Meeting available on the web-site.		
11.2	The project proponents shall satisfactorily address all the complaints/suggestions that have been received against the project till the date of submission of proposals for Appraisal.	Noted	--
12	**Court Cases**		
12.1	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending against the project.	--
13.	**Miscellaneous**		
13.1	NABET accredited consultant certificate along with consent letter that he has prepared the EIA & EMP report of the proposed project.	The accreditation certificate number NABET/EIA/24-27/RA 0354 is valid till 16th August 2027. Copy of NABET certificate is attached as **Annexure-V.**	**Annexure-V**
13.2	The Project Proponent should submit the EIA/EMP report as per the generic structure prescribed in Appendix-III of the EIA Notification,2006 after incorporating the details of public hearing conducted and covering the above-mentioned issues, to take further necessary action for obtaining environmental clearance in accordance with the procedure	Agreed	--

	prescribed under the EIA Notification,2006.		
13.3	Baseline data and public consultation shall not be older than 3 years, at the time of submission of the proposal, for grant of Environmental Clearance. The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP report, as per the Notification S.O.751(E) dated 17.02.2020. The instant TOR is valid up to four years from the date of issuance of TOR.	Baseline study period is Oct-Dec., 2024. Baseline monitoring report is attached as **Annexure-III.**	**Annexure-III**
B. Specific ToRs			
1.1 (i)	Measures to be taken for collection of Bio Medical Wastes.	Provided in EIA report.	Item no. 2.5 in Chapter- 2, table no. 2.3 of EIA report at Page no. 26.
(ii)	Details of equipments and their capacity to be installed in Project.	Details of equipments is provided in EIA report.	Item no. 2.5 in Chapter- 2, table no. 2.3 of EIA report at Page no. 31.
(iii)	Details of amount of waste to be generated from the hospitals on the per day basis rather than calculating on number of beds.	Waste generation with the list of HCEs in area is mentioned in the EIA.	Item no. 1.2 in Chapter- 1, table no. 1.1 of EIA report at Page no. 9.
(iv)	Aerial distance certificate from the nearby biomedical waste treatment	Aerial distance certificate from the nearby biomedical waste treatment facilities has been obtained from PCB and copy of the same is attached as **Annexure-XI**	**Annexure-XI**

	facilities		
(v)	Precautionary measures to be undertaken to avoid contamination of wastes or due to surface runoff from project site to the nearby water reservoir.	Precautionary Measures to Avoid Contamination of Waste or Surface Runoff is enclosed as **Annexure-XII**.	**Annexure-XII**
(vi)	Standard Operating Protocol starting from collection point of waste generation/raw material, segregation, transportation, treatment and disposal of waste generated from plant.	Standard Operating Protocol starting from collection point of waste generation/raw material, segregation, transportation, treatment and disposal of waste generated from plant is enclosed as **Annexure-XIII.**	**Annexure-XIII.**
(vii)	The baseline monitoring should also include biological parameters and baseline study should also cover the monsoon period.	Baseline monitoring data is enclosed as **Annexure-III.**	**Annexure-III.**
(viii)	The storage sheds provided for the biomedical waste should be covered.	Will be complied.	--
(ix)	Provide a buffer zone of 5km around the proposed site.	5 km buffer map is attached as **Annexure-XIV.**	**Annexure-XIV**
(x)	A write up on the amount of segregated waste to be handled at the project site monthly and annually.	The objective for the proposed project is to establish an Integrated Common Bio-medical Waste Treatment facility including the Incinerator, autoclave, shredder and effluent treatment unit to handle 7250 kg/day of Bio-medical waste	Item no. 2.1 in Chapter- 2, figure no. 2.1 of EIA report at Page no.20.
(xi)	Avoid using transport route passing through the village.	Will be complied.	--

<table>
<tr><td>(xii)</td><td>SOP/measures to be followed for safety and health issues (due to handling hazardous waste materials) of employees and local people of nearby villages.</td><td>SOP/measures to be followed for safety and health issues (due to handling hazardous waste materials) of employees and local people of nearby villages is attached as Annexure-XV.</td><td>Annexure-XV</td></tr>
<tr><td>(xiii)</td><td>Area details to be covered for collection of waste materials/raw materials.</td><td>Landuse break-up of Project Site
<table><tr><th>S. No.</th><th>Particulars</th><th>Area (m²)</th></tr><tr><td>1.</td><td>Plant Facilities (Waste storage rooms, autoclave, incinerator, shredder etc.)</td><td>3110.25</td></tr><tr><td>2.</td><td>Green Belt (33%)</td><td>3539.25</td></tr><tr><td>3.</td><td>Road, paved and open area</td><td>4075.50</td></tr><tr><td colspan="2">Total</td><td>10,725</td></tr></table></td><td>Item no. 2.4 in Chapter- 2, table no. 2.2 of EIA report at Page no.16.</td></tr>
<tr><td>(xiv)</td><td>Agreement papers or MoU with dealers for disposal of waste generated and its management.</td><td>The same will be submitted at the time of final EIA.</td><td>--</td></tr>
<tr><td>(xv)</td><td>Category wise list of wastes to be handled.</td><td>Category wise list of waste to be handled is mentioned in the EIA.</td><td>Item no. 2.5 in Chapter- 2, figure no. 2.3 of EIA report at Page no.27.</td></tr>
<tr><td>(xvi)</td><td>Internal drainage plan of the project site for smooth discharge of excess rainwater along with excess treated water showing the location of its discharge point to the nearest public drain. The location of the nearest public drain also to be shown in the above-mentioned lay out map.</td><td>Internal drainage plan is enclosed as Annexure-XVI.

This is a ZLD project. No water will be discharged outside project site.</td><td>Annexure-XVI.</td></tr>
</table>

(xvii)	Submission of a list of recognized Hospitals, Nursing Homes, Clinics along with the corresponding beds considered for this Project.	List has mentioned in obtained distance authentication around 75km radius of the project site from SPCB. Copy of the same is attached as **Annexure-XI**	**Annexure-XI**
(xviii)	Submission of documents for a prior arrangement with T.S.D.F for Hazardous Waste like incinerator ash, plastic recyclers for plastic wastes, metal foundries for recycling metal sharps, etc.	The same will be submitted at the time of final EIA.	--
(xix)	Adoption of OHSAS	The same will be submitted at the time of final EIA.	--
(xx)	Leachate from land filling/ETP drains/ flow in details. stack emission and leachate chemical analysis..	These details will be provided after operation of Plant.	--
(xxi)	Location of the incinerator and DG set with respect to predominant wind direction vis - a – vis the habitation and public roads.	Same has been shown in Plant layout and copy of the same is attached as **Annexure-VII.**	**Annexure-VII.**
1.2	At the time of conducting EIA, the capacity of the incinerator may be fixed according to the availability of raw material within the location as per the different capacities of incinerator prescribed in the guidelines on CBMWF,2016 issued by CPCB in this regard.	Will be complied	--

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1.	ToR letter
2.	NABL certificate
3.	Monitoring report
4.	Conservation Plan
5.	NABET certificate
6.	Conform write up
7.	Plant layout
8.	Land documents
9.	SOP for Furans
10.	CGWA NOC
11.	Distance authentication from SPCB
12.	Measures to avoid contamination, etc.
13.	SOP for waste collection
14.	5 km buffer map
15.	SOP for villagers safety
16.	Drainage map

CHAPTER-1 : INTRODUCTION

1.1 PURPOSE OF REPORT

Improper management of waste generated in health care facilities cause a direct health impact on the community, the health care workers and on the environment. Indiscriminate disposal of bio-medical waste and exposure to such waste poses serious threat to environment and human health. Bio-medical waste requires specific treatment and management prior to its final disposal.

Ministry of Environment, Forest & Climate Change (MoEF&CC), Govt. of India has introduced the new notification as Biomedical Waste Management Rules, 2016 under the Environment (Protection) Act, 1986 which replaces the earlier Biomedical Waste (Management & Handling) Rules, 1998. In accordance with the rules, every occupier of a healthcare establishment (HCF) shall either set up requisite biomedical waste treatment facility on site or ensure requisite treatment of the biomedical waste at an approved common treatment facility. It is to be ensured that no untreated biomedical waste shall be kept stored beyond a period of 48 hours.

According to Bio-Medical Waste Management Rules 2016 and its amendments till date Biomedical Waste Management Rules in 2016 which prescribes the standards for dioxin & furans from incinerator. Its considerable advantages have made CBWTF popular and proven concept in many developed countries. CBWTF as an option has been legally introduced in India. The Bio-medical Waste Management Rules makes it mandatory for the bio-medical waste generator within 75 km radius to treat the biomedical waste at the CBWTF.

The Government of India has made it mandatory for all developmental projects to prepare a detailed EIA study so that the impacts of the proposed developmental activity can be predicted, and a suitable management plan can be implemented before commissioning the project.

M/s MKD Eco Clean Private Limited has proposed a Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 56 0, 561, 562, 563, 565,566,567, Tehsil/Thana-Gondia District - Dhenkanal, Odisha for waste generated in radius of 75 K.M. The proposed project includes Incinerator with proper Air Pollution Control Device (APCD), Autoclave, Shredder and Effluent Treatment Plant.

The objective for the proposed project is to establish an Integrated Common Bio-medical Waste Treatment facility including the Incinerator, autoclave, shredder and effluent treatment unit to handle 7250 kg/day of Bio-medical waste.

As per EIA Notification 2006, amended vide Gazette Notification dated 17th April 2015, the project falls under Category “B” Projects of activity 7 (da), i.e. Common Bio-medical Waste Treatment Facilities.

The application (Form-1 along with Pre-Feasibility Report) was submitted to State Environment Impact Assessment Authority for grant of Terms of Reference (ToR) for conducting EIA Study for setting up of Biomedical Waste Treatment Facility.

The EIA study has been carried out based on Terms of Reference (ToR) issued vide letter No. 498744/54-INFRA2/10-2024 dated 24.03.2024 by the SEIAA, Odisha. Copy of ToR letter attached as **Annexure-I.**

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

1.2.1 Identification of Project

M/s MKD Eco Clean Private Limited has proposed a Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 56 0, 561, 562, 563, 565,566,567 tehsil/thana-Gondia District. Dhenkanal, Odisha for the proper handling and treatment of biomedical waste from health-care facilities (HCFs) in the region.

Biomedical Waste Management Rules 2016, stipulate that occupier of every organization generating biomedical waste (as defined in the Rules) must manage its biomedical waste as prescribed in the Rules so as not to cause any harm to human health and the environment. It may not be possible for individual health care establishments like small nursing homes, dispensaries, clinical laboratories and other small institutions or individual medical professionals to carry out treatment and disposal of biomedical waste generated as per the methods prescribed in the Rules on their own. Neither is it economical for even bigger hospitals to have their own treatment facilities to incinerate highly infectious waste. A CBWTF is an ideal and perhaps the only solution to all such problems. Accordingly, BMWM Rules 2016 recommends that no healthcare establishment can set up its own treatment and disposal facility if there is CBWTF in a radius of 75 km.

1.3 Objective of the project

- Establish a Common Bio-medical Waste Treatment facility including the Incinerator, autoclave, shredder and supporting infrastructure along with pollution control devices
- Collection of Segregated Biomedical waste from HCFs and its transportation, storage, treatment and disposal in accordance to the Bio Medical Waste Management Rules 2016 & subsequent amendments till 2018.
- Compliances with statutory and environmental norms.
- Develop concise waste management practices.
- Introduce a continuing waste management education program for all staff to increase awareness of Occupational Health & Safety issues and waste minimization principles.
- Adopt policies and procedures to minimize the environmental impacts of waste treatment and disposal.

- Reporting to regulatory authorities as needed.

1.4 Relevant Provisions of Biomedical Waste Management Rules 2016

"Bio-medical waste" means any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps.

"Bio-medical waste treatment and disposal facility" means any facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment and disposal is carried out and includes common bio-medical waste treatment facilities.

"Handling" in relation to bio-medical waste includes the generation, sorting, segregation, collection, use, storage, packaging, loading, transportation, unloading, processing, treatment, destruction, conversion, or offering for sale, transfer, disposal of such waste.

"Health Care Facility" means a place where diagnosis, treatment or immunization of human beings or animals is provided irrespective of type and size of health treatment system, and research activity pertaining thereto;

"Major accident" means accident occurring while handling of bio-medical waste having potential to affect large masses of public and includes toppling of the truck carrying bio-medical waste, accidental release of bio-medical waste in any water body but exclude accidents like needle prick injuries, mercury spills.

"Management" includes all steps required to ensure that bio- medical waste is managed in such a manner as to protect health and environment against any adverse effects due to handling of such waste;

"Occupier" means a person having administrative control over the institution and the premises generating biomedical waste, which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and clinical establishment, irrespective of their system of Medicine and by whatever name they are called;

"Operator of a common bio-medical waste treatment facility" means a person who owns or controls a Common Bio-medical Waste Treatment Facility (CBMWTF) for the collection, reception, storage, transport, treatment, disposal or any other form of handling of bio- medical waste;

Duties of the Occupier- It shall be the duty of every occupier to-

a. Take all necessary steps to ensure that bio-medical waste is handled without any adverse effect to human health and the environment;

b. Make a provision within the premises for a safe, ventilated and secured location for storage of segregated biomedical waste in colored bags or containers in the manner, to ensure that there shall be no secondary handling, pilferage of recyclables or inadvertent scattering or spillage by animals and the bio-medical waste from such

place or premises shall be directly transported in the manner as prescribed Biomedical Waste Management Rules 2016 &its amendments to the common bio-medical waste treatment facility or for the appropriate treatment and disposal.

c. Pre-treat the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or sterilization on-site in the manner as prescribed by the World Health Organization (WHO) or National AIDs Control Organization (NACO) guidelines and then sent to the common bio-medical waste treatment facility for final disposal;

d. Phase out use of chlorinated plastic bags, gloves and blood bags

e. Dispose of solid waste other than bio-medical waste in accordance with the provisions of respective waste management rules made under the relevant laws and amended from time to time;

f. Not to give treated bio-medical waste with municipal solid waste;

g. Provide training to all its health care workers and others, involved in handling of bio medical waste at the time of induction;

h. Ensure segregation of liquid chemical waste at source and ensure pre-treatment or neutralization prior to mixing with other effluent generated from health care facilities;

i. Ensure treatment and disposal of liquid waste in accordance with the Water (Prevention and Control of Pollution) Act, 1974;

j. Ensure occupational safety of all its health care workers and others involved in handling of bio-medical waste by providing appropriate and adequate personal protective equipment;

k. Maintain and update on day to day basis the bio-medical waste management register and display the monthly record on its website according to the bio-medical waste generated in terms of category and color coding.

l. Report major accidents including accidents caused by fire hazards, blasts during handling of bio-medical waste and the remedial action taken

m. Establish a system to review and monitor the activities related to bio-medical waste management, either through an existing committee or by forming a new committee and the Committee shall meet once in every six months.

Duties of the operator of a common bio-medical waste treatment and disposal facility - It shall be the duty of every operator to **-**

a. Take all necessary steps to ensure that the bio-medical waste collected from the occupier is transported, handled, stored, treated and disposed of, without any adverse effect to the human health and the environment, in accordance with Biomedical Waste Management Rules, 2016 and guidelines issued by the Central Government or the central pollution control board from time to time;

b. Ensure timely collection of bio-medical waste from the occupier;

c. Establish bar coding and global positioning system for handling of bio-medical waste within one year;

d. Inform the prescribed authority immediately regarding the occupiers which are not handing over the segregated bio-medical waste in accordance with these rules;

e. Provide training for all its workers involved in handling of bio-medical waste at the time of induction and at least once a year thereafter;

f. Assist the occupier in training conducted by them for bio-medical waste management;

g. Report major accidents including accidents caused by fire hazards, blasts during handling of bio-medical waste and the remedial action taken and the records relevant thereto;

h. Maintain a log book for each of its treatment equipment according to weight of batch; categories of waste treated; time, date and duration of treatment cycle and total hours of operation;

i. Allow occupier, who are giving waste for treatment to the operator, to see whether the treatment is carried out;

j. Shall display details of authorization, treatment, annual report etc.

k. After ensuring treatment by autoclaving or microwaving followed by mutilation or shredding, whichever is applicable, the recyclables from the treated bio-medical wastes such as plastics and glass, shall be given to recyclers having valid consent or authorization or registration from the respective State Pollution Control Board or Pollution Control Committee;

l. Supply non-chlorinated plastic, colored bags to the occupier on chargeable basis, if required;

m. Common bio-medical waste treatment facility shall ensure collection of biomedical waste on holidays also;

The prescribed authority' for enforcement of the provisions of these rules in respect of all the health care facilities located in any State/Union Territory is the respective State Pollution Control Board (SPCB)/ Pollution Control Committee (PCC) and in case of health care establishments of the Armed Forces under the Ministry of Defense shall be the Director General, Armed Forces Medical Services (DGAFMS).

1.5 Brief description of nature, size, location of the project and its importance to the country, region

A Common Bio-medical Waste Treatment Facility (CBWTF) is a set up where bio-medical waste, generated from a number of healthcare units, is suitably treated to reduce adverse

effects that this waste may pose on environment & human health. A part of the treated waste may finally be sent for disposal to a TSDF and balance for recycling purposes.

Table 1-1 : Summary

1.	Identification of project	As per EIA Notification 2006, as amended vide Gazette Notification dated 17th April 2015, the project falls under Category "B" Schedule 7(da)
2.	Project Proponent	**M/s MKD Eco Clean Private Limited**
3.	Registered Office Plant & Admin Office	**Plant:** Plot No.553/1081, 555,556, 557, 559, 560, 561, 562, 563, ,655, 566, 567 khata no. 123/124, Mauja- Asanbahali Tehsil/Thana Gondia, District: Dhenkanal, Odisha **Admin Office :** Plot no. 143/3933, IHB Colony Po- Sisupalgarh, Bhubaneswar- 751002
4.	Name of the proprietor	Mr. Lipshit Dash
6.	Area of plant	2.65 Acre (1.0725 ha)
7.	Topo Sheet No	F45T13
8.	Latitude	20°48'38.37"N
9.	Longitude	85°58'32.25"E
10.	Proposed Units& Total Capacity	Common Bio Medical Waste Management Project Proposed capacity of the plant 7250 kg/day. Autoclave – 0.50 m^3 Shredder – 400 Kg /hr Incineration (Rotary Kiln)– 400 kg/hr Incineration – 500 Kg/hr ETP – 10 KLD
11.	Cost of Project	INR 1.8 Crore
12.	Working Days	365
13.	Life Span of CBWTF	25 Years

Ministry of Environment, Forests & Climate Change (MoEFCC), Govt. of India has notified the Bio-Medical Waste Management Rules 2016. As per the rules, every occupier of a Health Care Establishment (HCF) 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. Keeping in view the difficulties faced by private Hospitals, Nursing Homes and Clinics that cannot make their own arrangements due to high cost involved in Treatment facilities, there is need for centralized system for treatment. Most of the hospitals do not have adequate arrangement for disposal of the hospital waste.

The objective for the proposed project is to establish an Integrated Common Bio-medical Waste Treatment facility including the Incinerator, autoclave, shredder and effluent treatment unit performing the following:

- Collection of Segregated Biomedical waste and its transportation, storage, treatment and disposal in accordance with Biomedical Waste Management Rules 2016.
- Compliances with statutory and environmental norms.
- Develop concise waste management practices.
- Introduce a continuing waste management education program for all staff to increase awareness of Occupational Health & Safety issues and waste minimization principles.
- Adopt policies and procedures to minimize the environmental impacts of waste treatment and disposal.
- Reporting to regulatory authorities as needed.

1.6 Establishment of the facility as per Bio-medical Waste Management Rules, 2016 & its amendments

Biomedical waste is highly infectious in nature and generated from various activities of health care. The fundamental of biomedical waste management, stipulated under the BMWM Rules, 2016 & is amendments is segregation of various type of wastes as per the color coding. The rules are applicable to all the persons who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.

Since Health Care Establishments have grown significantly, individual treatment and disposal is not desirable because of associated risks & high cost in addition to land constraints. This is likely to pollute the surrounding, as most of the HCF's are located in habitation areas. Therefore, BMWM Rules 2016 & amendments stipulate that treatment and disposal of segregated waste should be done in common Bio Medical Waste Management Facility. This will help in environmental sound management of medical waste in compliance to the provisions of BMWM Rules. The treatment and disposal of various types of BMW will be carried out as stipulated under the Rules.

1.7 Objectives and Description of Activities in EIA

The objectives of EIA are listed below:

- Characterization and bench marking of existing environmental status
- To identify and quantify significant impact on the environmental parameters during Construction, Commissioning, Operation and Decommissioning phases of the proposed

project.

- To recommend appropriate mitigation measures to avoid/ minimize pollution and health hazards, environmental disturbance, property damage and nuisance.
- Preparation of an environmental management plan to minimize adverse impacts of proposed project, a budget, monitoring plan, program to implement the same.

1.8 Activities involved in EIA study

EIA is a management tool to identify, frame and prioritize the environmental issues in such a way as to work out the mitigation measures to allow the negative impacts to be minimized or to be avoided during different phases of the proposed project.

EIA process passes through the following phases:

- Screening & Scoping
- Regulatory approval of ToR
- Desktop study of the project details and study area to understand environmental issues and identify Secondary data sources and identify Environmental indicators
- Field studies (Primary survey) collection of baseline environmental data for study area
- Impact identification, prediction and evaluation
- Assessment of alternatives and delineation of Environment Management Plan
- Risk Assessment (RA) and Disaster Management Plan (DMP)
- Review and finalization of EIA report
- EIA report submission

1.9 Site Selection Criteria of CBWTF and Site History

In the context of CPCB guidelines for CBWTFs, a buffer zone represents a separation distance between the source of pollution in CBWTF and the receptor - following the principle that the degree of impact reduces with increased distance. The following parameters may be considered for ascertaining buffer distance on case-to-case basis:

(i) potential for spread of infection from wastes stored in the premises.

(ii) applicable standards for pollution control and the relative efficiency of the existing incinerators and emission control systems,

(iii) potential of fugitive dust emission from incinerators,

(iv) potential for discharge of wastewater

(v) the potential for odour production,

(vi) the potential for noise pollution,

(vii) the risk posed to human health and safety due to exposure to emissions from incinerator,

(viii) the risk of fire and

(ix) Significance of the residual impacts such as bottom ash and fly ash.

As far as possible, the CBWTF shall be located near to its area of operation in order to minimize the transportation distance in waste collection, thus enhancing its operational flexibility as well as for ensuring compliance with the time limit for treatment and disposal of bio-medical waste as stipulated under the BMWM Rules (i.e., within 48 hours). Also, the location of the CBWTF should be in conformity to the CRZ Norms and other provisions notified under the Environment (Protection) Act, 1986. The location shall be decided in consultation with the State Pollution Control Board (SPCB)/Pollution Control Committee (PCC).

The location criteria for development of a CBWTF are as follows:

a. A CBWTF shall preferably be developed in a notified industrial area without any requirement of buffer zone (or)

b. A CBWTF can be located at a place reasonably far away from notified residential and sensitive areas and should have a buffer distance of preferably 500 m so that it shall have minimal impact on these areas. In case of non-availability of such a land, the buffer zone distance from the notified residential area may be reduced to less than 500 m by SPCB/PCC without referring the matter to CPCB by prescribing additional control measures such as

i. Adoption of best available technologies (BAT) by the proponent of CBWTF;

ii. Prescribing stringent standards for operation of the CBWTF by the SPCB/PCC;

iii. Adoption of zero liquid discharge by the CBWTF and

iv. In case of any complaints from the public, then CBWTF should prove that the facility is not causing any adverse impact on environment and habitation in the vicinity. If SPCB/PCC is not in a position to resolve the issue relating to buffer zone while selecting the site for CBWTFs, in such a case, SPCBs/PCCs may refer the matter to CPCB.

c. The CBWTF can also be developed as an integral part of the Hazardous Waste Treatment Storage and Disposal Facility (TSDF) subject to obtaining of necessary approvals from the authorities concerned including 'environmental clearance' as per Environmental Impact Assessment 2006 and further amendments notified under the Environment (Protection) Act, 1986, provided there is no CBWTF existing within 75 KM distance from the site.

1.10 Generic Structure of EIA Report

1.	**Introduction**	• Purpose of the Report • Identification of Project and Project Proponent • Brief description of nature, size, location of the project and its importance to the country, region. • Scope of the Study – details of regulatory scoping carried out (As per terms of reference). • Site Selection Criteria • Site History
2	**Project Description**	Condensed description of those aspects of the project (based on project feasibility study), likely to cause environmental effects. Description contains the details of the following: ▪ Type of Project ▪ Need for the Project ▪ Location details showing general location, specific location, project boundary and project site layout. ▪ Size or Magnitude of Operation ▪ Project description including drawings showing project layout, components of project *etc*. ▪ Proposed schedule for approval and implementation, ▪ Technology and Process Description, ▪ Schematic representations of the feasibility drawings which give information important for EIA purpose. ▪ Description of mitigation measures incorporated into the project to meet environmental standards, environmental
3	**Description of the Environment**	▪ Study Area, Period, Components and Methodology. ▪ Establishment of baseline for valued Environmental Components, as identified in the scope. ▪ Study Period: October, 2024 to December, 2024. ▪ Base maps of all Environmental Components.

4	**Anticipated Environmental Impact And Mitigation Measures**	▪ Details of Investigated Environmental impacts due to project location, possible accidents, project design, project construction, regular operations. ▪ Measures for minimizing and/or offsetting adverse impacts identified. ▪ Irreversible and Irretrievable commitments of environmental components. ▪ Assessment of significance of impacts (Criteria for determining significance, Assigning significance), ▪ Impact scores and Mitigation Measures. ▪ Air Modeling.
5	**Analysis of Alternatives (Site and Technology)**	In case, the scoping exercise results in need for alternatives: Description of each alternative Selection of alternative
6	**Environmental Monitoring Programme**	Technical aspects of environmental monitoring for the effectiveness of mitigation measures (including measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures,
7	**Additional Studies**	▪ Public Hearing ▪ Risk Assessment DMP
8	**Project Benefits**	• Improvements in physical infrastructure, • Improvements in social infrastructure, • Employment potential – Skilled; semi-skilled and unskilled,
9	**Environmental Cost**	• Cost Benefit Analysis
10	**Environmental Management Plan**	▪ Description of the administrative aspects of ensuring that mitigation measures are implemented and their effectiveness monitored, after approval of the EIA. • Explanation of how, adverse effects have been mitigated.
11	**Summary and Conclusions**	▪ Overall justification for implementation of the project.
12	**Disclosure of Consultant Engaged**	▪ The names of the Consultants engaged with their brief resume and nature of consultancy rendered.

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CHAPTER-2 : PROJECT DESCRIPTION

2.1 Introduction

The proposed CBWTF is a green field project. The Project Proponent proposes to develop a Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 565,566,567, Tehsil/thana-Gondia District. Dhenkanal, Odisha. including Incinerator, Autoclave, Shredder and Effluent treatment unit. The facility will process 7250 kg/day of Bio-medical waste.

2.2 Project Description

The salient features of the project are given in Table No. 2.1.

Table No. 2-1: Silent features of the project

Location	Plot No.553/1081, 555,556, 557, 559, 560, 561, 562, 563, ,655, 566, 567, Khata no. 123/124, Mauja- Asanbahali Tehsil/Thana Gondia, District: Dhenkanal, Odisha
Acquired Area	2.65 Acre (1.0725 ha)
Category of Project	7 (da) Bio-Medical Waste Treatment Facilities
Coverage area of waste collection	within radius of 75 km
Project site Toposheet No.	F45T13
Co-ordinates	Latitude: 20°48'38.37"N Longitude: 85°58'32.25"E
Nearest Habitation	Asand Bahali : 0.9 km towards NNE
Nearest city	Cuttak City : 40.0 km towards SSW
Nearest Highway	o NH 53: 6.5 km towards ENE o Kashipur-Nihalprasad Road: 1.3 km towards S
Nearest Railway Station	Jenapur Railway Station: 10.30 km towards ENE
Nearest airport	Biju Patnaik International Airport: 64.0 km towards SSW
Seismic Zone	III
Facility	• Proposed capacity of the plant 7250 kg/day. • Autoclave – 0.50 m3 • Shredder – 400 Kg /hr • Incineration (Rotary Kiln)– 400 kg/hr • Incineration – 500 Kg/hr • ETP – 10 KLD
Water requirement and source	The total water requirement for the project is 12 KLD and will be sourced from Ground water.

Total Power load and source	40 KW to be procured from Tata Power Central Odisha Distribution Limited (TPCODL).
Manpower requirement	30 no.
Estimated capital cost	INR 30 lakh
Issue of ToR	SEIAA, Odisha File no. 498744/54-INFRA2/10-2024 dtd. 24.03.2025

2.3 LOCATION OF THE PROJECT (MAPS SHOWING GENERAL LOCATION,SPECIFIC LOCATION, PROJECT BOUNDARY & PROJECT SITE LAYOUT).

The geographical location map of the proposed project site and the topographical map (10 km radius) is given in **Figure No. 2.1 and 2.4** respectively. The Topo map is given in **Figure No. 2.3**.

Connecting road is adjacent to the project site in North direction from the project site. The Google image of the plant site is presented in **Figure No. 2.1:**

Figure 2-1: Google Image showing connecting road

The Project site is located at Plot No.553/1081, 555,556, 557, 559, 560, 561, 562, 563, 655, 566, 567 khata no. 123/124, Tehsil/Thana Gadia, Mauja-District: Dhenkanal, Odisha.

NH-53 which is at 6.5 km in ENE and Kashipur-Nihalprasad Road is at 1.3 km in South direction from the project site. The nearest railway station is Jenapur Railway Station at 10.3 km towards ENE from the project site. Nearest airport to the project site is Biju

Patnaik International Airport at a distance of 64.0 km towards SSW from the project site.

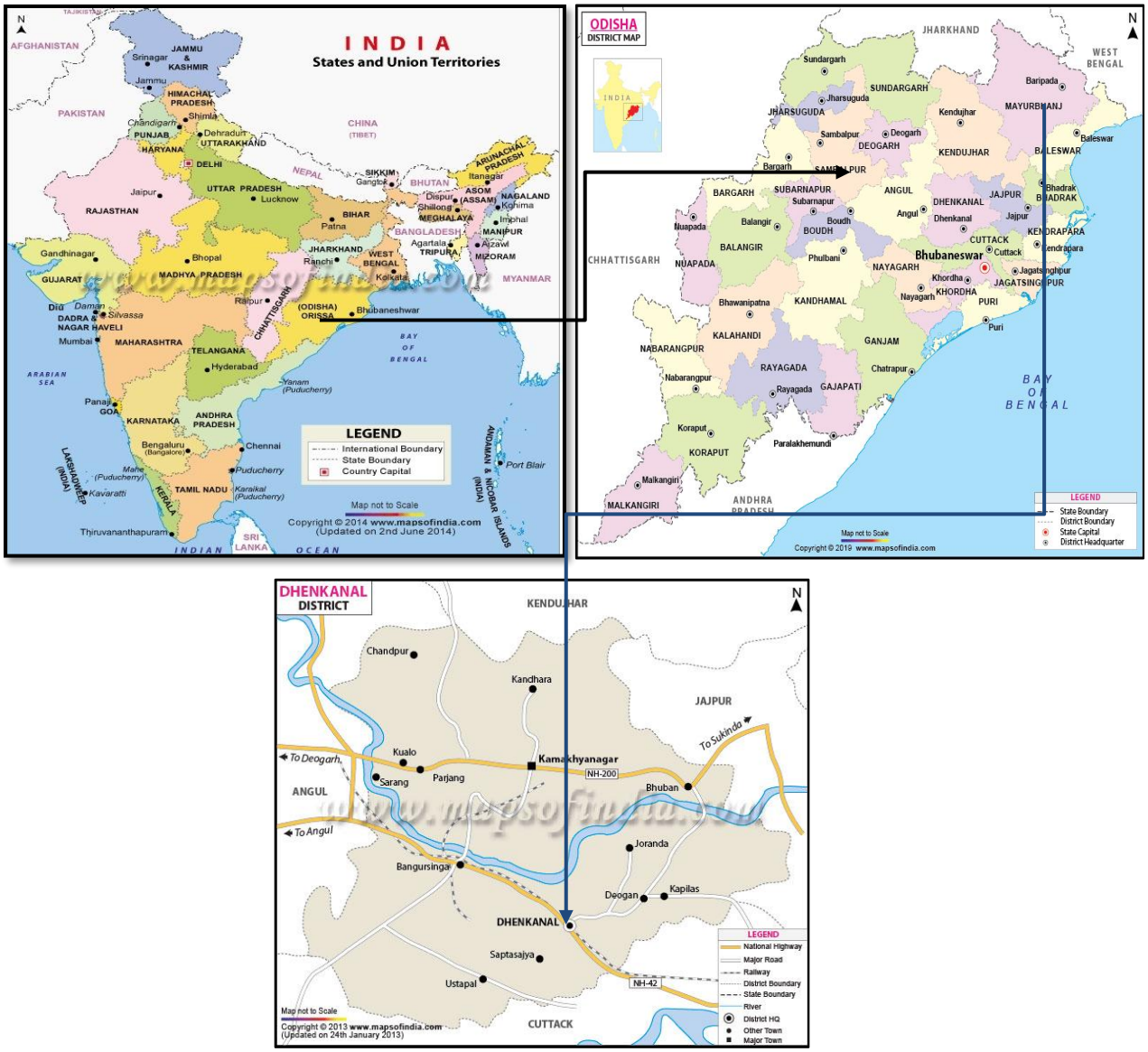

Figure 2-2: Location Map of project site

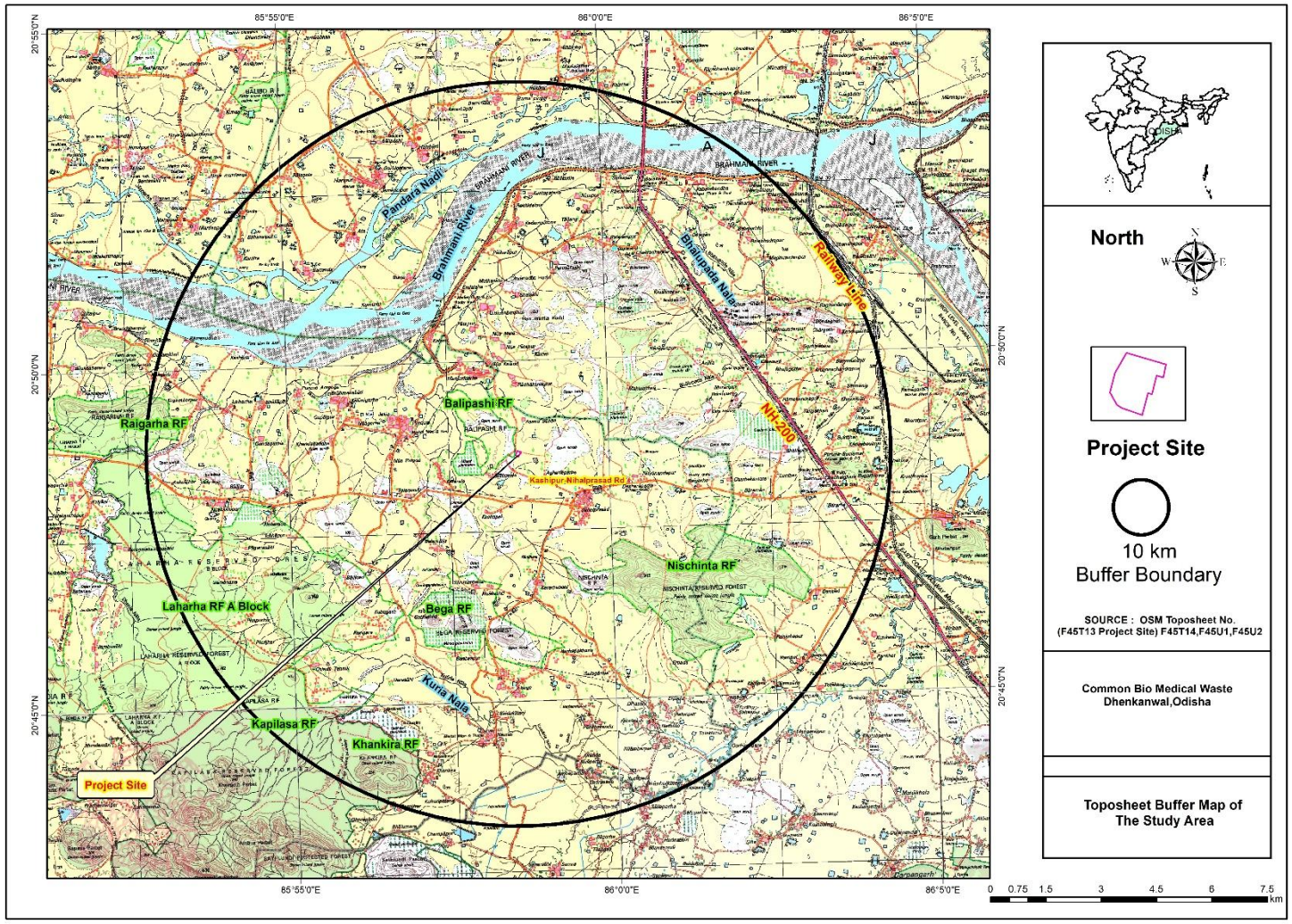

Figure 2-3: SoI Toposheet of the study area (10 Km Radius)

2.4 Land Use and Infrastructure Development

Land requirement for the facility including its breakup for various purposes, its availability and optimization:

The total land, acquired for the facility is 10,725 sqm (2.65 acre). The land use breakup of the proposed facility is given in Table No. 2.2. The layout map of the facility is presented in Figure No. 2.4.

Table 2-2: Landuse break-up of Project Site

S. No.	Particulars	Area (m^2)
1.	Plant Facilities (Waste storage rooms, autoclave, incinerator, shredder etc.)	3110.25
2.	Green Belt (33%)	3539.25
3.	Road, paved and open area	4075.50
Total		**10,725**

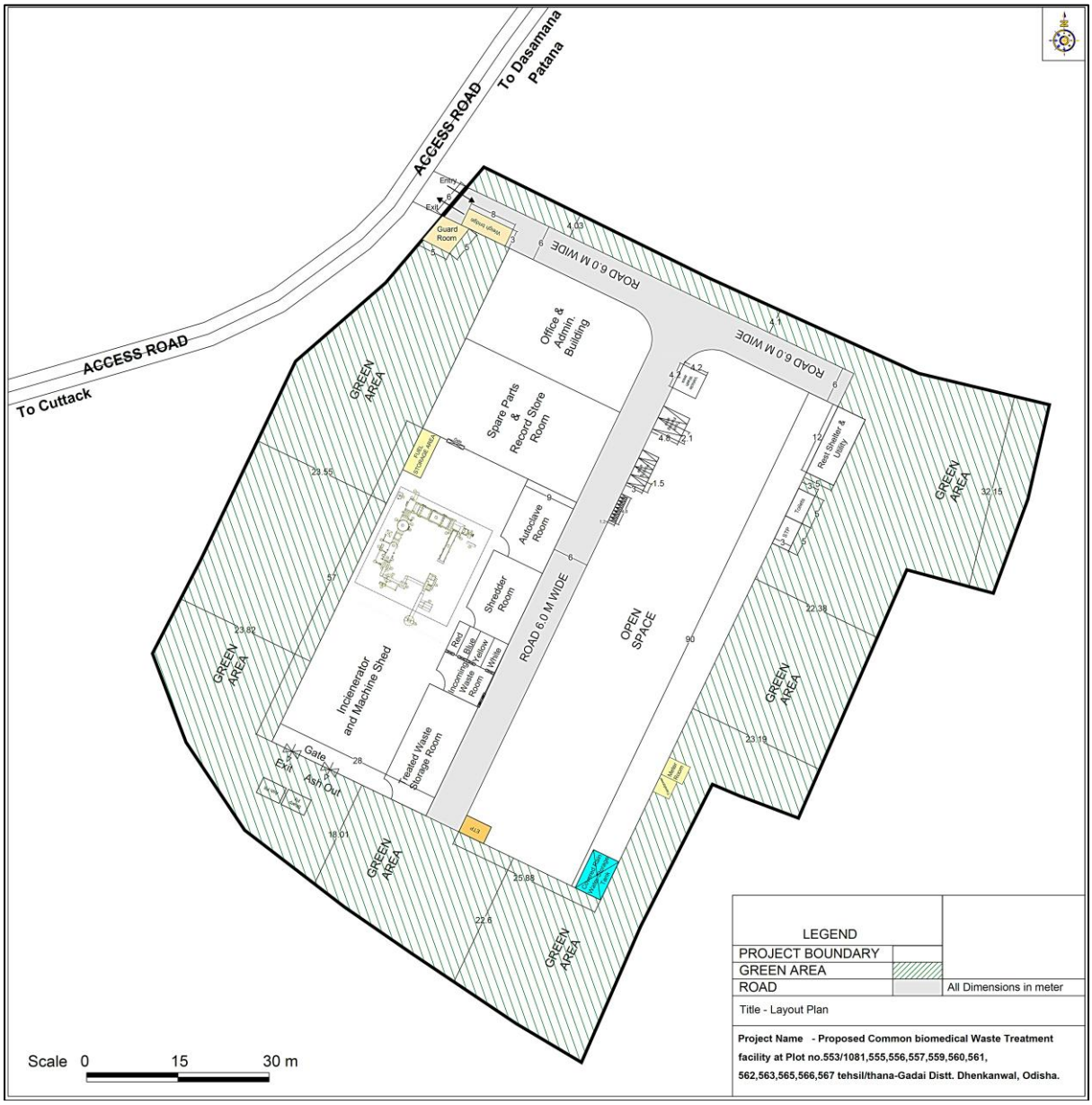

Figure 2-4 : Layout of Project Site

2.5 Bio Medical Waste Processing Procedure

2.5.1 Waste Segregation and packaging

Bio Medical Waste is segregated in color coded plastic bags by the health care facilities at the source and kept in intermittent storage area. The bags will be weighed for each type of waste using bar code scanners and record will be kept. The containers or bags shall be labeled as per specification. (**Table No. 2.3**). Discarded drugs and chemicals shall not be collected for disposal that will be returned to the manufacturer.

Table No. 2-3: Waste Segregation and Packaging

S. No.	Color coding	Category of Waste	Types of Bag/Containers to be used
1	**Yellow**	**(a) Human Anatomical Waste** Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).	Yellow colored non-chlorinated plastic bags
		(b) Animal Anatomical Waste Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.	
		(c) Soiled waste Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components.	
		(d) Expired or Discarded Medicines Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.	Yellow colored non-chlorinated plastic bags
		(e) Chemical Waste Chemicals used in production of biological and used or discarded disinfectants.	Yellow colored containers or non-chlorinated plastic bags
		(f) Chemical Liquid Waste Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X-ray film developing liquid, discarded Formalin, infected secretions, aspirated body fluids, liquid from laboratories and floor washings, cleaning, house-keeping and disinfecting activities etc.	Separate collection system leading to effluent treatment system

		(g) Discarded linen, mattresses, beddings contaminated with blood or body fluid	Non-chlorinated yellow plastic bags or suitable packing material
		(h) Microbiology, Biotechnology and other clinical laboratory waste Blood bags, Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.	Autoclave safe plastic bags or containers
2	Red	**Contaminated Waste (Recyclable)** Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and *fixed needle syringes*) and vaccutainers with their needles cut) and gloves.	Red colored non-chlorinated plastic bags or containers
3	White (Translucent)	**Waste sharps including Metals** (Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object) that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps)	Puncture proof, Leak proof, tamper proof containers
4	Blue	**(a) Glassware** Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.	Puncture proof, leak proof boxes or containers with blue coloured marking
		(b) Metallic Body Implants	

Source : BMWM Rule, 2016 (Schedule-I)

2.5.2 Features of Vehicles

Details on collection and transportation of bio medical waste from health care establishments. No. of vehicles and feature of vehicles etc.

The waste bags will be transported through dedicated fully covered vehicles. The vehicles will be leak proof and completely covered. Biohazard symbols will be placed on all sides of the vehicles. Based on the locations & number of the HCFs, the route of

the vehicle for collection of bio-medical Waste will be decided, so that BMW will not be stored for more than 24 hours. All the vehicles, used for transportation of BMW from HCF's to the CBMWTF will be owned by the CBWTF. The following specifications are adopted while designing the transport vehicles:

Vehicle shall be fitted with GPS to track the movement of the vehicle.

Separate cabins shall be provided for driver/staff (picker) and the biomedical waste containers.

The base of the waste cabin shall be leak proof to avoid spillage of liquid during transportation.

The waste cabin designed for storing waste containers in tiers and also provided with a lighting provision.

The waste cabin shall be easily washed washable and disinfected.

The waste cabin shall have provisions for sufficient openings in the rear sides so that waste containers can be easily loaded and unloaded.

The vehicle shall be labeled with the biohazard symbol (as per the Schedule III of the Rules) and also display the name, address and telephone number of the CBWTF.

Initially 2 numbers of pickup trucks shall be deployed to cater for the purpose.

The unloaded color-coded bags will be stored in color coded stored area.

2.5.3 Treatment and Disposal

Incineration and autoclaving are the major process of treatment. Shredding will be done for all autoclaved /disinfected wastes. Details of treatment and disposal are given in Table No. 2.4.

Table 2-4 Treatment and Disposal of waste

Category	Type of Waste	Type of Bag Container to be used	Treatment and disposal by M/s MKD Eco Clean Pvt. Ltd.
Yellow	(a) Human Anatomical Waste	Yellow colored non-chlorinated plastic bags	Incineration
	(b) Animal Anatomical Waste		
	(c) Soiled Waste		

	(d) Expired or Discarded medicines	Yellow colored non-chlorinated plastic bags	Will be returned to the manufacturer or will be treated with incineration at temperature >1200^{o}C or will be sent to hazardous waste treatment, storage and disposal facility for Encapsulation or Plasma Pyrolysis at >1200^{o}C.
	e) Chemicals used in production of biological and used or discarded disinfectants	Yellow colored containers or non-chlorinated plastic bags	Incineration
	(f) Chemical Liquid Waste:	Separate collection system leading to effluent treatment system	ETP at the collection site/hospital
	g) Discarded linen, mattresses, beddings contaminated with blood or body fluid	Non-chlorinated yellow plastic bags or suitable packing material as per BIS standard	Non-chlorinated chemical disinfection followed by incineration
	(h) Microbiology, Biotechnology and other clinical laboratory waste:	Autoclave safe plastic bags or containers as per BIS standard	Autoclave safe plastic bags or containers Pre-treat to sterilize with non- chlorinated chemicals on-site
Red	Contaminated Waste (Recyclable)	Red colored non-chlorinated plastic bags or containers as per BIS standard	Autoclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent to registered or authorized recyclers

White	Waste sharps including Metals:	Puncture proof, Leak proof, tamper proof containers	Autoclaving followed by shredding ; and sent for final disposal to iron foundries (having consent to operate from the State Pollution Control Boards or Pollution Control Committees)
Blue	(a) Glassware: Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.	Cardboard boxes with blue colored marking	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving and then sent for recycling
	(b) Metallic Body Implants	Cardboard boxes with blue colored marking	
	Incineration Ash	Collected in HDPE container	Sent to Hazardous waste Secured Land Fill outside

2.5.4 Treatment Equipment's:

2.5.4.1 Incinerator

A mechanical loading dual chambered incinerator to cater for disposal of 4.8 TPD of medical wastes, with the primary chamber operating at 800°C ± 50°C and the secondary operating at 1050°C ± 50°C. The flue gases shall be run through a ventury and flooded scrubber and then vented through a 30-m height stack. Yellow Category (a, b, c, e and g) shall be directly loaded into the incinerator. Yellow category (d) if in case it is to be incinerated it will be incinerated at temperature >1200^{o}C.

Site for deep burial will be explored for treatment/storage of waste during maintenance of the incinerator.

The technical specifications of the incinerator are presented in Table 2.5.

Table 2-5 Technical specifications of incinerator

Name of the equipment	Incinerator
Application	Incineration of Bio-medical waste
Capacity	7250 kg/day

Method of feeding the waste	Through a Belt Conveyor/ Hydraulic Power Pack
Principle of Operation	Controlled Combustion of Air
Fuel	LDO/HSD/DIESEL
Heating Media	Through Oil fired fully automatic Burner assembly
Design temperature	1400°C
Operating Temperature (Primary Chamber)	800°C ± 50°C
Operating Temperature (Secondary Chamber)	1050°C ± 50°C Residence time at least two seconds
Fuel consumption	25 kg/hr ± 5 (27 lit./ hr)

Diesel will be the active fuel for incinerator as per the specification. It will require 25 kg/hr or 27 l/hr for a standard operation time of 16 hr, 432 liter of diesel will be required per day.

On primary chamber, one feed hopper shall be provided. An electrically operated top cover is provided at top of the hopper which is suitable for to and fro movements. The Features are as follows:

- Dual Chambered Incinerator, with MS outer shell and Internal lining using high alumina refractory
- Loading shall be mechanical
- Interconnected ducting shall also be lined system
- They shall be connected with fully automatic spark ignited burners to be run using HSD with all necessary interlocks like the cut-off systems
- The system shall be supported with combustion air supply through an FD fan
- Temperatures in both the chambers shall be continuously recorded
- Graphically/through a data logger

Various components involved in the process is given in Table 2.6.

Table 2-6: Various components involved in Process

A	Combustion chamber	
	Combustion Chamber	Dual combustion chamber (Primary and Secondary Chamber)
	Type	Vertical

	Material of construction	Mild Steel
	Size	1600 mm dia. x 3000 mm Ht with top conical
	(i) Primary chamber	
	Material of construction	Body made form 5 mm thick IS 2062 MS Plate materials supported with structural section materials.
		It shall be sturdy to withstand any stress or strain formed during the operation inside portion of the chamber shall be lined with high alumina fire bricks and backed up by insulations bricks confirming to IS 2042 grades.
	Combustion Burner	Fully automatic operated burner assembly oil fired type comprising diffuser plate, photo state Housing electrode with holding brackets, solenoid valve, electrodes, flexible hose pipes, spray nozzle, oil filter, fuel injection pump, blower etc. connected with 1.00 HP electric motor, air regulator etc.
	Fire Grate Bars	Fire grate bars shall be provided at bottom portion of the inside of Primary Chamber. This fire bars are made from High alumina fire bricks
	One feed Hopper with electrically operated top cover shall be provided for to and from movements.	
	(ii) Secondary Chamber	
	Material of construction	As per Primary Chamber
	Combustion Burner	One unit, fully automatic operated burner Assembly oil fired type (LDO/HSD).
	Retention time	2 to 2.5 seconds.
	Doors	All doors are made from 5 mm thick MS Plate Duly lined with high grade castable Refractory, duly lined with high grade castable Refractory when closed.
	Belt Conveyor	500mm Width x 8 m. long complete with carrying idlers, return idlers, supporting structure, idler brackets, take up arrangement, drive and tail pulley, drive units comprising 2 HP electric motor, gear box belts and Pulleys, base frame, side skirts etc.
B	Electrical panel board	

	Control panel	made from MS Sheet material powder coated complete with in all respect provided with temperature Controller cum indicator for Primary Chamber and Secondary Chamber, indicator for Ventury, scrubber, stack overload relay, contactor, Fuses and switches & fitted.
	PLC Based panel	Supplied with stabilizer with printing arrangement
C	Blower	
	Type	Centrifugal
	HP	3.00
	Capacity	680 m^3/hr
	Static pressure	22''WC
	Material of construction	Mild steel
D	Water quenching system	
	(i) Quencher	
	Type	Vertical, cylindrical
	Size	700 mm dia x 3000 mm Ht
	Material of construction	Made from IS: 2062 MS Plate (5 mm thick), Inside portion duly lined with special Grade Refractory material with a thickness of 50 mm.
	(ii) Spray nozzle	
	Application	For spraying raw water for quenching the temperature coming from the secondary Chamber to Ventury.
	Material of construction	Graded Cast Iron
	(iii) Quenching Tank	
	Type	Rectangular
	Size	1500 mm L x 1000 mm W x 1000 mm H
	Material of construction	Made from 4 mm thick IS 2062 MS Plate along with Structural section materials. Inside portion duly lined
		with ebonite Rubber lining with a thickness of 5 mm inside MSRL perforated plate shall be provided.
	(iii) Quenching Pump	
	Type	40 mm x 40 mm
	Size	Semi open Impeller type Flurry Pump
	HP	2 HP
	Material of construction	Body made from Graded Cast Iron

	Impeller	Non Metallic
E	Wet Scrubbing System Comprises the Following: (Scrubbing Media through Caustic Lye mixed water)	
	Type	Vertical, Cylindrical, top and bottom conical Inside portion lined with high grade heat Resistance castable refractory of 40 mm thick Provided with zig-zag passing baffles Top and bottom conical with flange welded with shell for bolting.
	Size	700 mm dia x 3000 mm Ht
	Material construction	Made from 5 mm thick IS 2062 MS Plate.
	Maintenance door	Shall be provided made from 5 mm thick IS 2062 MS Plate materials duly lined with Refractory materials and fitted with High quality gaskets to seal the door when closed.
	Supporting structure	Made from heavy structural section materials
	Filtration cum Circulation Tank (Common Tank For Scrubber & Ventury)	
	Size	1500mm L x 1250 mm W x 1250 mm H
	Material construction	Made form 5 mm thick MS Plate. Inside portion Duly rubber lined with 5 mm thick Coating of ebonite rubber. Inside MSRL perforated plate along with filter cloth with required connections and nozzles.
	Shower	For spraying the caustic dye mixed water
	Material construction	Made from SS Materials
	Installation	At top of Scrubber
	Circulation Pump	For circulation of Caustic Lye Mixed water
	Common Pump for Venturi & Scrubber	
	Type	Semi open Impeller type Mud Pump
	Size	40 x 40 mm
	HP	3
	Material of construction	Non-Metallic
	Pipe lines and valve fittings, operation and maintenance platform	Made from IS structural section materials and plate materials
F	Venturi	
	Type	Pressurised nozzle
	Tower Height	30 m

	Throat dia.	200 mm
	Material of construction	5 mm thick
	Shower	For spraying the water inside the venturi
	Material of construction	SS 304
G	Duct Line	
	From combustion Chamber to Ventury	Made from 5 mm thick MS Plate material and the inside portion duly lined with high grade heat resistance Refractory materials within a thickness of 50 mm
	From Secondary Chamber to quencher, quencher to Ventury, Ventury to Gas Scrubber, Gas scrubber to Moisture separator, Moisture	Made form 5 mm MS Plate materials
	separator to ID Fan and ID Fan to Chimney.	
H	ID Fan	
	Capacity	5097 m^3/hr
	Static pressure	550 mm WC
	HP	15 HP
	Attachment	Base frame, damper, V- Belts and Pulleys, Guards etc.
	Material of Construction	SS 304
I	Chimney	Mild steel, Height 30m, Diameter 500mm
J	Moisture Separator	
	Type	Rectangular Zigzag passing
	Size	1200 mm H x 1000 mm L X1000mm W
	Material of construction	5 mm thick IS: 2062 MS Plate materials
K	Painting	
	All components	Two coats with heat resistant silver paints

Incineration of waste materials destroys completely the waste by oxidation process using auxiliary fuel producing flue gases such as carbon dioxide, water and nitrogen and some acidic gases such as oxides of sulphur, nitrogen, acids and other toxic gases such as heavy metals, dioxins and furans etc. as well as solid form of ash, depending upon the waste constituents of the waste and performance of incineration system.

When complete combustion occurs, carbon and hydrogen combine with the oxygen of the combustion air to form carbon dioxide (CO_2) and water vapour (H_2O). If incomplete combustion occurs, carbon monoxide (CO) also will be formed.

The Combustion Efficiency (CE) shall be at least 99%. The temperature of the primary chamber shall be a minimum of 800°C ± 50°C and the secondary chamber shall be at a minimum of 1050°C ± 50°C. The secondary chamber gas residence time shall be at least two seconds.

The incineration process should follow the prescribed emission standard **Table 2.7**.

Table 2-7: Emission Standards (Incineration)

S. No.	Parameter	Standards	
		Limiting concentration in mg/ Nm^3 unless stated	**Sampling Duration in minutes, unless stated**
1	Particulate matter	50	30 or 1 Nm^3 of sample volume, whichever is more
2	NO2	400	30 for online sampling or grab sample
3	HCL	50	30 or 1 Nm^3 of sample volume, whichever is more
4	Total Dioxins and Furans	0.1ngTEQ/Nm^3 (at 11% O_2)	8 hours or 5 Nm^3 of sample volume, whichever is more
5	Hg and its compounds	0.05	2 hours or 1N Nm^3 of sample volume, whichever is more

Source : BMW Rule, 2016 (Schedule-II)

Air Pollution Control Device (APCD)

The gases after being burnt at 1050°C ± 50°C in incinerator shall be run into a ventury scrubber, an air pollution control device followed by a flooded scrubber with water quenching arrangement. The scrubber shall be an alkaline scrubber to neutralize the gases and ensure trapping of any pollutants escaping into the environment. The purpose of water quenching is to reduce the temperature of the gases which are at high temperature. The clean gases are let out into the environment.

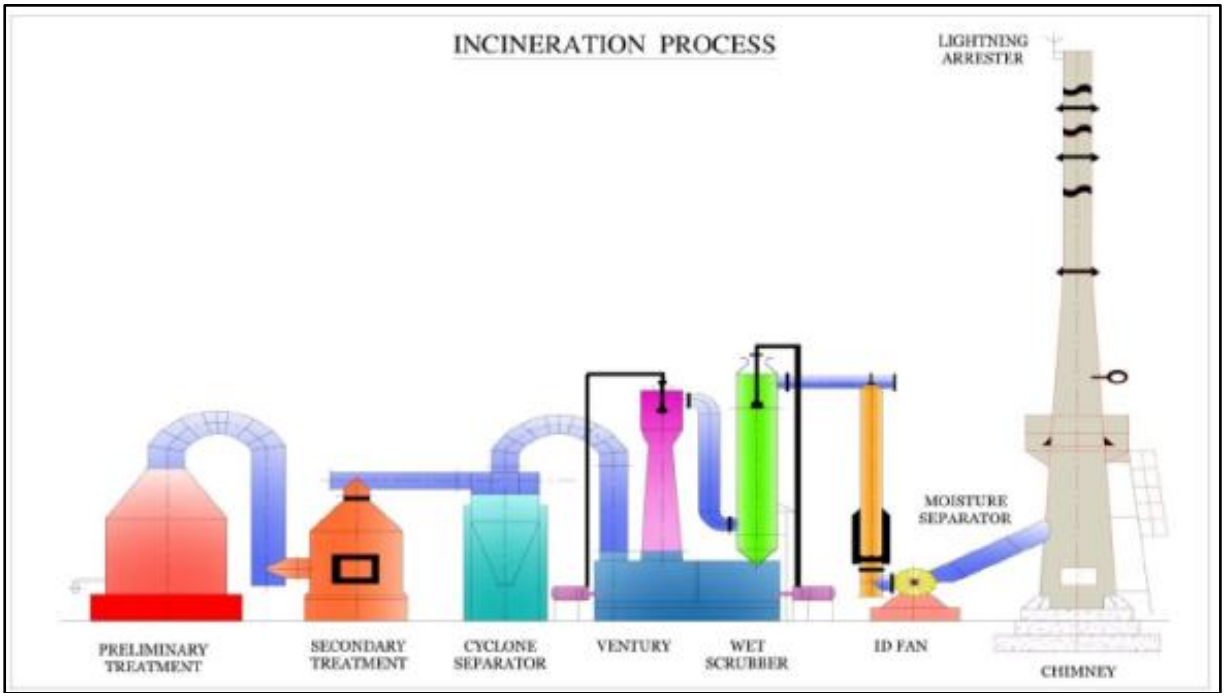

Figure 2-5: Process Flow Sheet (Incinerator)

The Incinerator will be provided with a stack height meeting MoEF&CC Guidelines (minimum 30m height), quencher, venturi scrubber, and alkaline wet scrubber.

Minimum stack height shall be 30m above the ground and shall be attached with the necessary monitoring facilities.

2.5.4.2 Autoclave

Red category waste will be loaded into the autoclave for sterilization. The autoclave is to sterilize the waste with steam (temperature of 121°C with 15psi pressure and 60min duration). At this temperature and pressure, microorganisms are completely destroyed. The sterilized plastics will be shred and sold to authorized recyclers only.

If the glass and metal implants in Blue colored bags are put into autoclaves, it will be put separately and after the complete sterilization, it will be sold as such to authorized recyclers. The sterilized blue bags will not be shred since shredding glass especially along with the metal implants would be dangerous and is not required.

For the white (translucent) category puncture proof, leak proof, tamper proof containers, where metal sharps are segregated and stored, the recommended treatment is "Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container or cement concrete; combination of shredding cum autoclaving; and sent for final disposal to iron foundries (having consent to operate from the State Pollution Control Boards or Pollution Control Committees) or sanitary landfill or designated concrete waste sharp pit."

Therefore, the translucent or white containers with the metal sharps segregated at source (in wards or locations wherever the metal sharps are generated) will be autoclaved separately and it will be sent to authorized iron foundries for recycling/ final disposal.

A vacuum type (programmable) autoclave which can operate at all the specifications mentioned by MoEF with a capacity to handle 2 T of medical waste per day shall be installed. The autoclave shall have continuous and automatic recording of temperature, pressure, date, time and batch of loading. Every batch shall be monitored with a strip chart recorder and once in a month the spore validation test and/or spore monitoring shall be done. Following are the key features of the proposed autoclave (Computerized recording):

Type	:	Vacuum Type, automatic with documentation
Capacity	:	2 TPD
Temperature	:	135°C
Pressure	:	35 psi
Time	:	45 min
Automation	:	PLC with MMI (Man-Machine interface)

Specification of Autoclave

The specification of autoclave is as follows.

- With the number of pulses, vacuum strength for pulse, sterilization time, operating temperature & pressure, drying time & post vacuum strength-all these parameters selectable & programmable as per the requirement.
- M.O.C Chamber & jacket 304 grade stainless steel.
- All body parts like stand, door & pipe line are made by original 304 grade stainless steel
- Self-diagnostic system is incorporated in microprocessor programming & provided fault / error message with indication & alarm on system failure
- Manual operating arrangement is also provided in case of auto system failure for emergency use
- Solenoid valve for sterilization, fast exhaust, vacuum, vacuum break, water fill used will be Y' type / rotary actuator type / electrical (I.S.O. Company)
- Printer (thermal paper, no ink required) facility available with batch no sterilization date time & temperature
- Kirloskar water vacuum pump for drying process

- Crompton water pump for water filling
- Saves electricity up to 50%

The material of construction is as follows.

Chamber	:	S.S. 304 in 6 mm thickness
Jacket	:	S.S. 304 in 6 mm thickness
Outer Cover	:	S.S. 304 in 1 mm thickness
Black Plate	:	S.S. 304 in 6 mm thickness
Stand	:	S.S in12 standard wire gauge round pipe
Doors	:	S.S. 304 in 12.5 mm thickness.

Figure 2-6: Autoclave

2.5.4.3 Shredder

A mechanical shredder to mutilate /make the waste unrecognizable as medical waste shall be installed with a capacity to handle about 7250 kg/day to run for 9 to 10 hrs for capacity 400 kg/hr. The specifications of the shredder are presented in **Table 2.8**.

Table 2-8: Specifications of Shredder (Plastic Waste)

Capacity	400 Kg/hour
No of cutters	36 nos.
Motor rating	7.5 H.P., 3 PHASE,1440 rpm
Motor make	Crompton Greaves

Gear Box	20:1 Ratio
No of rotating shafts (SS 304)	02 nos.
No of Bearings	04 nos.
No of Couplings	02 nos.
No of gears	02 nos.
Shaft speed	70 - 100 RPM (User defined)
Machine Size	6' X 5' X 2.5' (H X W X D)
Control panel	7.5 H.P. AC DRIVE (Schneider/Delta make), emergency stop switch, door lock safety switch, Automatic Cutter Reversal on Overload
Collection Trolley	Metal of Construction - Stainless Steel with castors
Stand (Base)	With Anti Vibration Pads
MOC	The Stand MOC will be Mild Steel spray painted (Primer Base). The Loading hopper will be SS 304. The motor, gear box and cutter assembly will be covered with a SS 304 box type enclosure. The control panel will be on this enclosure.

Sterilized and shredded plastics will be supplied to non-food grade authorized plastic recycler. Shredded metals metallic body implants to be supplied to authorize vendors having valid consent to operate metal recycling or foundries from SPCB. In absence of that it may be sent to TSDF. Disinfected/ Sterilized glass will not be shredded but will be given as such to authorized glass recyclers.

Figure 2-7: Shredder

2.5.4.4 Effluent Treatment Plant (ETP) Wastewater Management

An ETP-10 KLD will be established to treat the scrubbed water, floor washings and other wastewater from the plant and recirculate the treated water into the scrubber (APCD) as well as utilize it in the greenbelt development, thereby making the system a zero liquid discharge system. The system shall be neutralization, settling followed by pressure sand filter and activated carbon filter assembly before recirculation into the scrubber. The Scrubbing Effluent, Autoclave Effluent, Floor and Reactor Washings will be collected in a Sump and sent for treatment. The system for treatment of wastewater from different sources shall be comprising of the following units

- Cooling of the hot scrubber liquor & other effluent
- Addition of chemicals with agitation in equalization tank followed by flocculation tank.
- Settling in tube settler
- Overflow to be filtered in Pressure Sand Filter and Activated Carbon Filter.
- Sludge from Tube settler to be transferred to the Sludge Drying Bed

There will be a provision of cooling of the hot effluent through water jacketed pipelines to normalize the temperature of the effluent. After cooling of the effluent to a temp of 30^0C, the same will be transferred to the equalization tank for treatment with chemicals for coagulation & proper mixing in mixing cum flocculation tank. After

flocculation, effluent will be transferred to the tube settler for settling the solids & separation of sludge as under flow. The overflow of the tube settler will be passed though Pressure Sand Filter and Activated Carbon Filter for filtration & fed to the scrubbers. The permissible limits as per the standard of CPCB are as follows **Table 2.9**. The process flow of ETP is given in **Figure 2.9**.

Table 2-9: Effluent Standard (ETP)

Parameter	Permissible Limit
pH	6.5-9.0
Suspended solids	100 mg/l
Oil and grease	10 mg/l
BOD	30 mg/l
COD	250 mg/l
Bio-assay test	90% survival of fish after 96 hours in 100% effluent

(Source: CPCB)

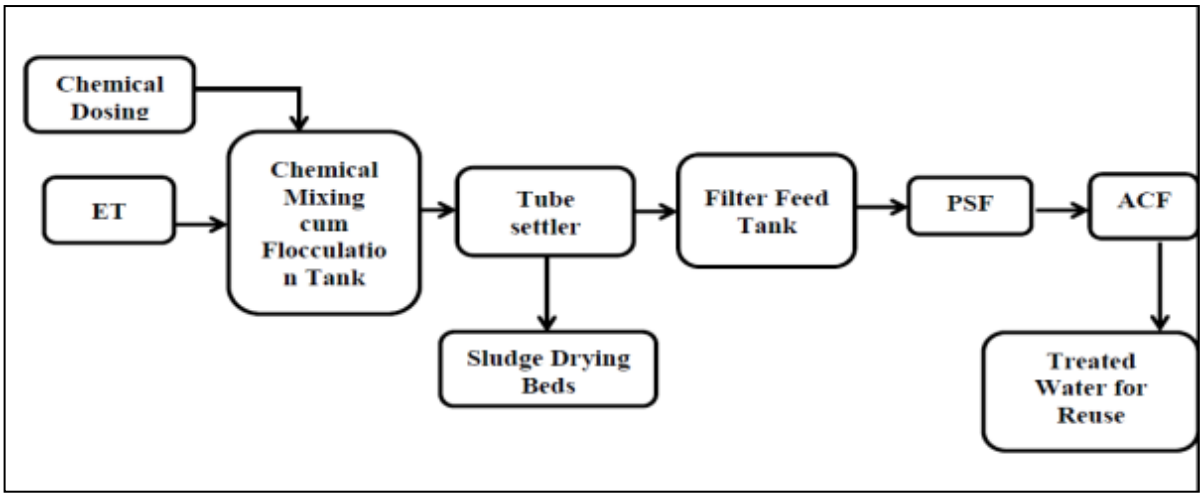

Figure 2-8: Flow Diagram of ETP

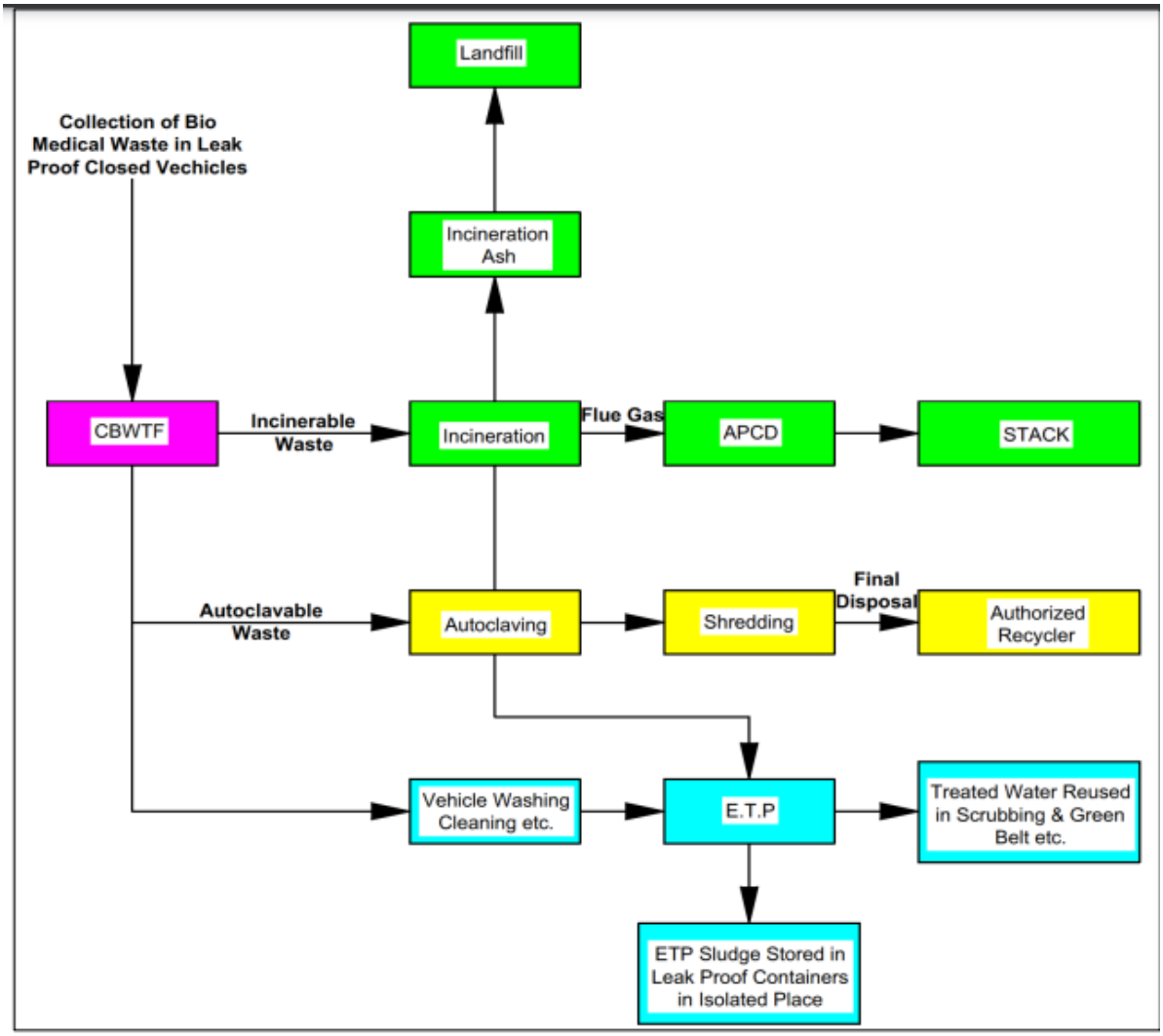

Figure 2-9: Process Flow diagram

2.6 Requirement of Water, Power and Fuel

2.6.1 Water Requirement

The total water requirement for the project is 12 KLD out of which 6.81 KLD is fresh water which is sourced from Ground water and treated/recycled water 4.34 KLD from ETP and STP. The details of the water requirement are given in **Table 2.10** & Water balance diagram given in **Figure 2.11.**

Table 2-10: Details of Daily Water Requirement

S.no.	Particulars	Details	Basis	Fresh Water (KLD)	Recycled Water (KLD)	Total Water (KLD)
1.	Domestic	30 nos.	@45 lpcd	1.35	-	1.35 KLD
2.	Industrial	-		-	-	-
a.	Floor washing, vehicle, container washing, etc.			2.76	0.84	3.60 KLD

b.	Make up water for Quenching			2.7	-	2.7 KLD
3.	Greenbelt	3539.25 sqm.	@1 lt/sq.m	-	3.5	3.5 KLD
	Total			**6.81 KLD**	**4.34 KLD**	**11.15 KLD say 12 KLD**

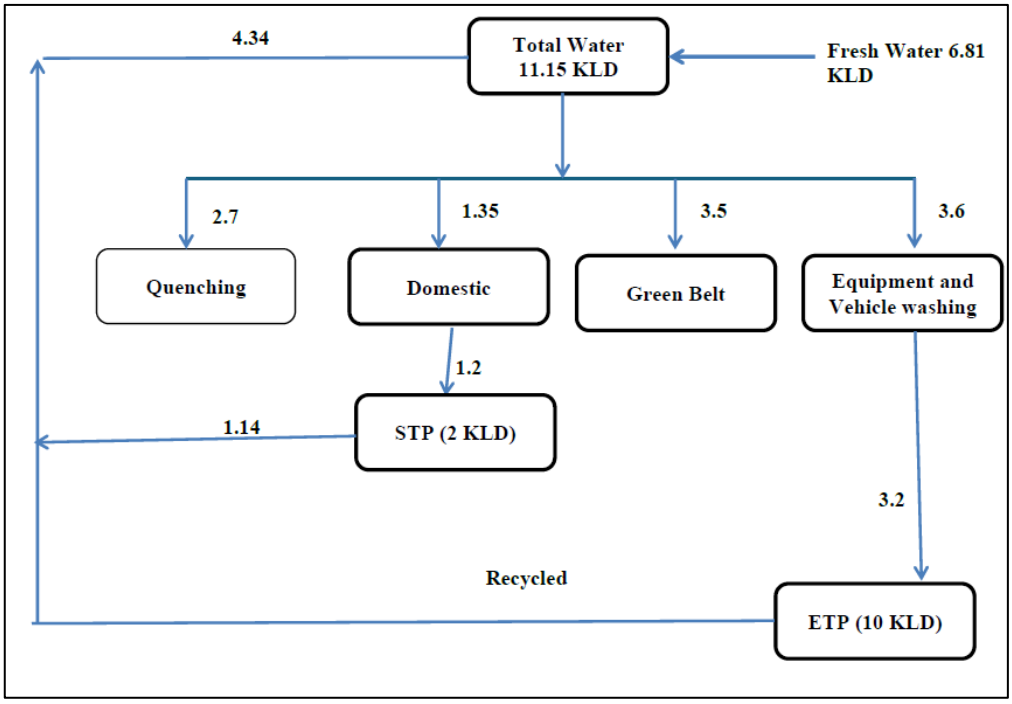

Figure 2-10: Water Balance Diagram

2.6.2 Power and Fuel

The power required for the facility is 40 KW and will be procured from Tata Power Central Odisha Distribution Limited (TPCODL). For emergency backup, a 1 DG set (60 KW) will be there.

2.6.3 Requirement of Manpower

The detail of manpower requirement for the proposed project is given in **Table 2.11.**

Table 2-11: Manpower Requirement During Construction phase

S. No.	Details	Manpower
1	Permanent Employment	3
2	Temporary Employment	8

Table 2-12: Manpower Requirement During Operation phase

S. No.	Details	Manpower
1.	Management /Skilled	4
2.	Business Development	3
3.	Management /Skilled	6
4.	Semi-Skilled/supervisory staff	4
5.	Unskilled	5
6.	Drivers	6
7.	Helpers	4
8.	Security	3
	Total	**30**

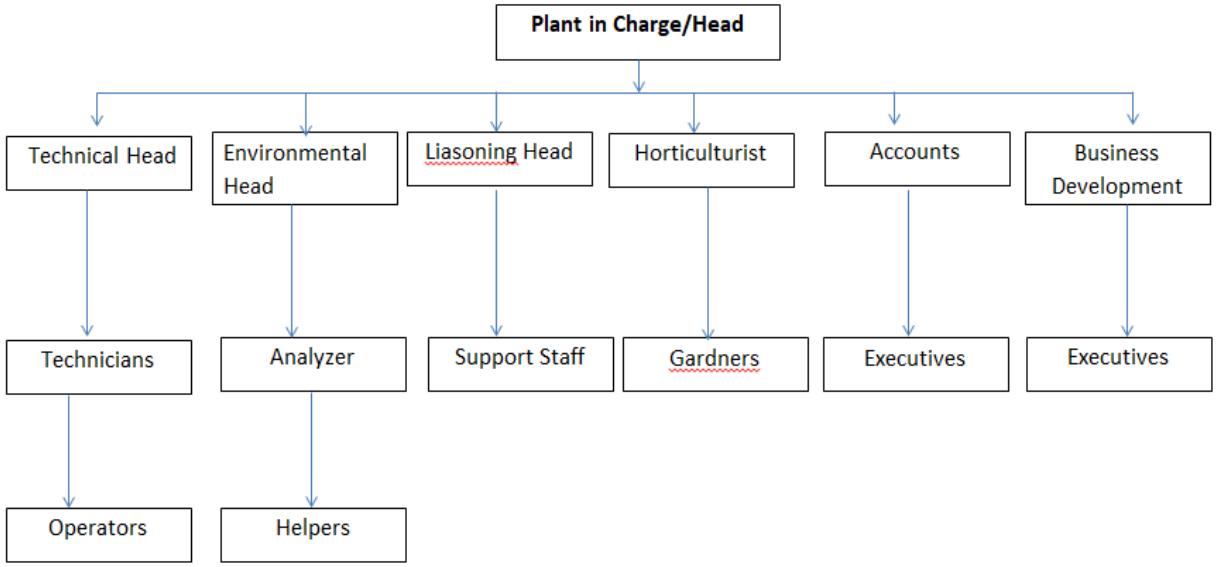

Figure 2-11: Proposed Hierarchy of the Plant

2.6.4 Budgetary Estimation

The estimated project cost is approx. INR 1.8 Crore.

2.7 Implementation Schedule

The conceptualization, erection & commissioning of the proposed project shall be completed within 1 2 months after obtaining all statutory clearance.

The establishment of the project will help abate the nuisance created by open disposal of biomedical waste and generating chances of spreading of susceptible communicable diseases.

2.8 Health & Safety

During the operation of the plant and during handling chemicals, a practice of preventive and protective maintenance will be adopted to take care of employee's health. The various safety equipments like breathing apparatus, gum boots, goggles and helmet will be provided to the workers/operators. Besides, all the first aid, firefighting devices will also be inspected, tested and maintained all the time in ready to use condition. Health of all the employees in plant area will be regularly monitored by the physician. If any abnormality is found, necessary treatment will be given from time to time.

2.8.1 Occupational Hazards

The operators are also exposed to hazards related to work in confined spaces, which include electric shocks, explosions, entanglement in moving machinery, etc. Against natural calamities like floods, earthquakes, lightening, possible accidental hazards fire & explosion hazards – Electricity – Slips, trips and falls at work, chemical hazards, biological hazards and ergonomic, psychological and organization factors.

The following types of occupational hazards can occur with cleaning/collection or transportation of waste etc. Accidental cut or punctures from infected sharps such as, hypodermic needles, scalpels, knives etc. Contact with infected material like pathological waste, used gloves, tubing etc, Flammable and toxic Hazards due to loss of containment of flammable Hazardous waste handled, stored and disposed, Chemical embankment for spillages etc.

2.9 Record Keeping

Maintenance of records for all operations carried out at the CBWTF is very important to monitor over all operation of the CBWTF. It helps in submission of the annual report to be submitted to the prescribed authority by 30th June of every year. The record includes all information relating to each activity at the CBWTF site as per BMWM Rules, which include occurrence of accidents (spills, injury and fire accidents) and the measures taken. The minimum requirement is outlined as follows.

- Records of waste movements
- Logbook for treatment equipment
- Monitoring and reporting of operations in the CBWTF
- Site records such as Fuel consumption, Sludge generation, ash generation, scraps produced,

2.9.1 Records of waste movements

Daily records shall be maintained for the waste accepted and treated waste removed from the site. The accepted waste records on day-to-day basis shall be maintained i.e, waste

collection time and date, name of the HCF with bar code, waste category, vehicle registration number deployed for the collection of biomedical waste from member health care facilities, time at which the waste collected from the member HCF, name of the vehicle driver with signature and waste receiving time and date at CBWTF site. Similar information has to be acknowledged to the member health care facility by the CBWTF operator on a daily basis. The treated waste to be disposed-off should include date, treated waste type and quantity.

Logbook for treatment equipment

A logbook shall be maintained for each treatment equipment installed at the site as per the CPCB formats which include

- Weight of each batch
- Categories of wastes as per rule
- Time, date and duration of each treatment cycle and total hours of operation
- The complete details of all operational parameters during each cycle

2.9.2 Monitoring and reporting of operations in the CBWTF

Monitoring provides the operator with information needed to make decisions on necessary combustion control adjustments. Properly maintained monitoring records can provide useful information for identifying operating trends and potential maintenance problem.

The CBWTF operator shall carry out the effluent testing, stack emission monitoring and validation test of equipment's through a NABL approved laboratory or a laboratory approved under the EP Act, 1986 as per the frequency stipulated under BMWM Rules, or as prescribed by the SPCB/PCC.

2.9.3 Site records

Site records should include the following:

- All the approvals obtained from other concerned departments other than the prescribed authority
- Details of construction or engineering works
- Maintenance schedule, breakdowns/trouble shootings and remedial actions
- Emergencies
- Incidents of unacceptable waste received and the action taken
- Details of the site inspections by the officials of the regulatory authorities, purpose of visits with date and necessary actions initiated in the observations
- Record keeping of fuel consumption, Sludge generation, ash generation, scraps

produced etc.

Daily, monthly and annual summary records of all the above will be maintained and made available at the site for inspection and submission to the concerned regulatory authorities.

2.9.4 Development of Website

The PP will develop a website of the CBWTF project representing the following information.

- A copy of the Environmental Clearance obtained and Copies of Consents and Authorization from SPCB
- List of all the member Health Care Facilities with complete address, bedded or non-bedded HCFs, no. of beds, bar code, category-wise average bio-medical waste generation in kg/annum
- Charges levied on the HCFs for treatment and disposal of bio-medical waste
- Vehicles connected with a provision of GPS and vehicle-wise route chart for collection, transportation of BMW from member HCFs
- Real time continuous online stack emission monitoring data
- Daily bio-medical waste collected, received and treated (Member HCF-wise)
- Monthly details of total waste collected from the member HCFs, total waste treated and treated recyclable plastic waste or glass waste sold to the parties and final mode of disposal of incineration ash.
- A copy of annual report submitted to the respective SPCB
- Provision to have access to the SPCB/CPCB/MoEFCC/MoH&FW especially on GPS, online monitoring system and data
- Besides the above provisions, the following important provisions should also be made.
- A telephone, first aid box, Proper lighting shall be provided and maintained at the facility
- Proper care shall be taken to keep the facility and surroundings free from odors.
- Measures shall be implemented to control pests and insects at the site
- Measures shall be implemented to control the escape of litter from the site
- Necessary provision shall be made to prevent and control noise generated, if any, due to the activities at the site
- Necessary protective gear for the waste handlers shall be provided

- Annual medical check-up of all the workers of CBWTF against all the diseases including especially Tetanus and Hepatitis-B as stipulated under the BMWM Rules
- Workers should have provisions such as washing, toilet and should have provision of suitable space for eating.
- Workers should also be provided with N-95 mask besides other PPEs such as hand gloves, gumboots, goggles etc.

PP shall prepare a work-plan which would include details of facilities at the CBWTF, collection, transportation and storage of the bio-medical wastes, operational details etc.

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CHAPTER-3 : DESCRIPTION OF THE ENVIRONMENT

3.1 Introduction

Baseline environmental information helps the decision makers to evaluate the present environmental scenario and to predict the environmental impact due to the proposed project. Data on the prevailing environmental components such as meteorology, water, noise, land, ecology, aesthetic and socio-economic are collected. The study area comprises of two zones for the generation of baseline data collection i.e, core zone (plant site) and buffer zone (10 km radius around the core zone). Baseline environmental monitoring was carried out from Oct- Dec, 2024 (Post-monsoon) by NABL accredited laboratory. Copy of NABL certificate is attached as **Annexure-II**. The details of this study are defined here.

3.2 Topography

The present Dhenkanal district has geographical area of 6657 square kilometers. Administratively district is divided into 3 sub divisions (Sambalpur, Sadar, Kuchinda and Rairakhol), 9 community development blocks namely Bamra, Dhankauda, Jamankira, Jujumura, Kuchinda, Maneswar, Naktideul, Rairakhol and Rengali with 148 Gram Panchayats and 1247 villages in it (Plate I). Almost all part of district can be traversed by state highway and other major district, gram panchayat, village and forest roads during fair weather conditions.

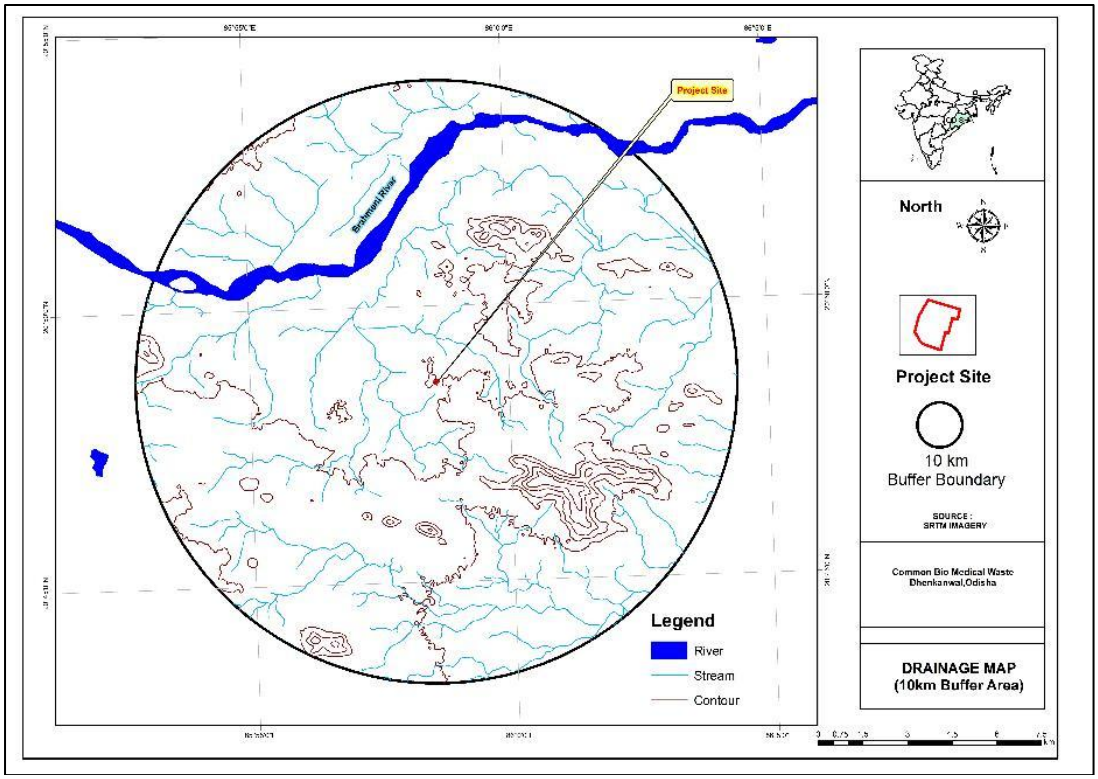


Figure 3-1: Drainage Pattern

3.3 Land Use

Land use map based on satellite imagery including location specific sensitivities such as national parks/wildlife sanctuary, villages, industries etc. The buffer zone land use covers Settlement, Water Bodies, River, Open Scrub, Vegetation, Forest, Agricultural Land. Land use map is presented in Fig. 3.2. The land use break-up of buffer zone is given in Table 3.1.

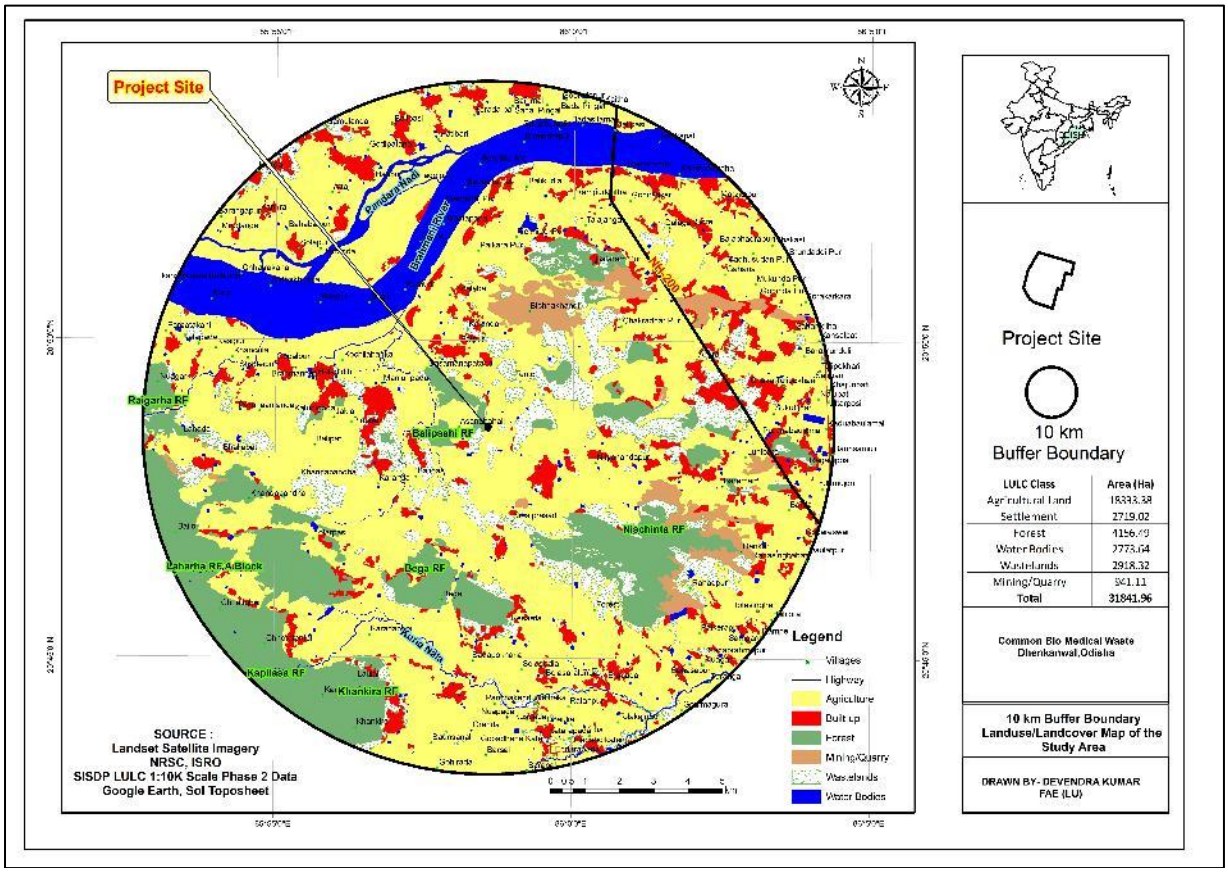


Figure 3-2: Land Use pattern of the Buffer Zone (10 Km. Radius zone)

Table 3-1: Land Use pattern of the Buffer Zone (10 Km Radius zone)

S. No.	Land use	Area (Ha)	Area (%)
1	Agricultural Land	18333.38	57.57
2	Settlement	2719.02	8.54
3	Forest	4156.49	13.05
4	Water Bodies	2773.64	8.71
5	Wastelands	2918.32	9.16
6	Mining/Quarry	941.11	2.95
	Total Area	**31841.96**	**100**

3.4 Meteorological Condition

Meteorological study is conducted by installing a temporary weather station at project site to record temperature, relative humidity, atmospheric pressure, rainfall, wind speed and its direction.

3.4.1 Wind Pattern

The detailed analysis of wind pattern for the study period is given in the **Table 3.2**, and the wind roses are given in the **Figure 3.3** respectively.

The predominant wind direction is from NE direction towards SW direction.

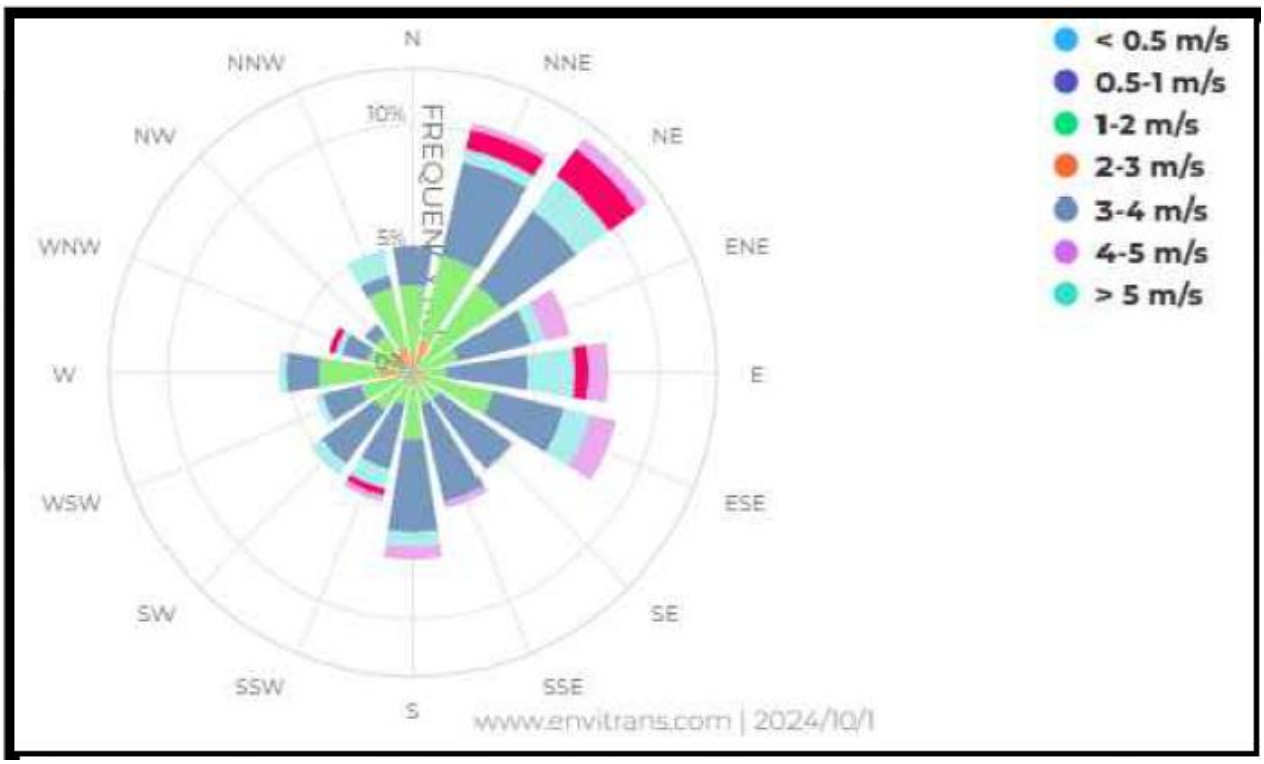


Figure 3-3: Windrose for the month of October to December, 2024

3.5 Ambient Air Quality (AAQ)

For AAQ study, stations were selected based on the habitation density, sensitive receptors, predominant wind direction, wind speed and atmospheric stability category in the region which governs the plume rise and dispersion of air pollutants. Eight stations were chosen and samples of parameters i.e., PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO were collected as per CPCB guidelines and analyzed. The samplers were installed at 3m height above the ground level for sampling. These stations represent approximately the highest ground level of the area and practically have no obstruction. The details of air quality monitoring stations w.r.t project site are given in **Table No. 3.4 & Figure No. 3.4.** The summarized AAQ monitoring data (maximum, minimum and 98 percentile readings) are presented in **Table No. 3.5.**

Monitoring report is attached as **Annexure-III.**

3.5.1 Selection of Sampling Locations

A systematically designed air quality surveillance programme forms the basis for impact assessment on air environment due to proposed project activities. The basic consideration for designing such a programme includes representative selection of sampling locations, adequate sampling frequency, duration of monitoring and monitoring of all relevant and important pollution parameters (NAAQS, 2009). The parameters selected for air quality are PM_{10}, $PM_{2.5}$, Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_X) and Carbon Monoxide (CO).

Following points were considered during the selection of Ambient Air Quality Monitoring locations.

- Predominant wind direction
- Upwind direction
- Topography of the study area,
- Densely populated areas,
- Location of surrounding Industries,
- Facility for Ambient Air Monitoring,
- Avoidance of proximity of roads

3.5.2 Frequency and Parameters for Sampling

A network of eight ambient air-sampling locations has been selected for assessment of the existing status of air environment within the study zone. Sampling and analysis were carried out for the parameters PM2.5, PM10, SO2, NO2, CO were monitored at all 8 locations. After the completion of sampling, samples were brought to the laboratory in Ice box and filter box for analysis. The samples were collected twice a week at each sampling location for three months. CPCB approved methods were followed for sampling and analysis. The frequency of sampling is given in the following table 3.3.

Table 3-2: Parameters sampling duration

Attribute	Parameter	Frequency of Monitoring
AAQ	PM10, PM2.5, SO2 and NOx,	24 hr sampling
	CO	8 Hr sampling

The location of the selected stations with reference to the Project Site is given in the **Table 3.4**:

Table 3-3: AAQ Monitoring Locations

S. No.	Air sampling Location code	Location	Co-ordinates	Distance (km)	Direction
1	AAQ1	Project Site	20°48'37.65"N 85°58'34.58"E	0	Centre
2	AAQ2	Balrampur (Up Wind)	20°51'44.34"N 85°59'59.66"E	6.2	NE
3	AAQ3	Belamalia (Dn Wind)	20°47'12.12"N 85°57'10.06"E	3.8	SW
4	AAQ4	Karanda (Cross Wind)	20°48'6.90"N 85°57'24.22"E	2.2	WSW
5	AAQ5	Nihalprasad (Cross Wind)	20°47'56.03"N 85°59'38.75"E	2.2	ESE
6	AAQ6	Asand Bahali (Sensitive-Near Forest)	20°49'12.32"N 85°58'32.36"E	1.0	N
7	AAQ7	Balikiari (Sensitive)	20°46'49.44"N 85°55'45.47"E	5.9	SW
8	AAQ8	Bega (Habitation)	20°45'5.61"N 85°58'33.06"E	6.4	S

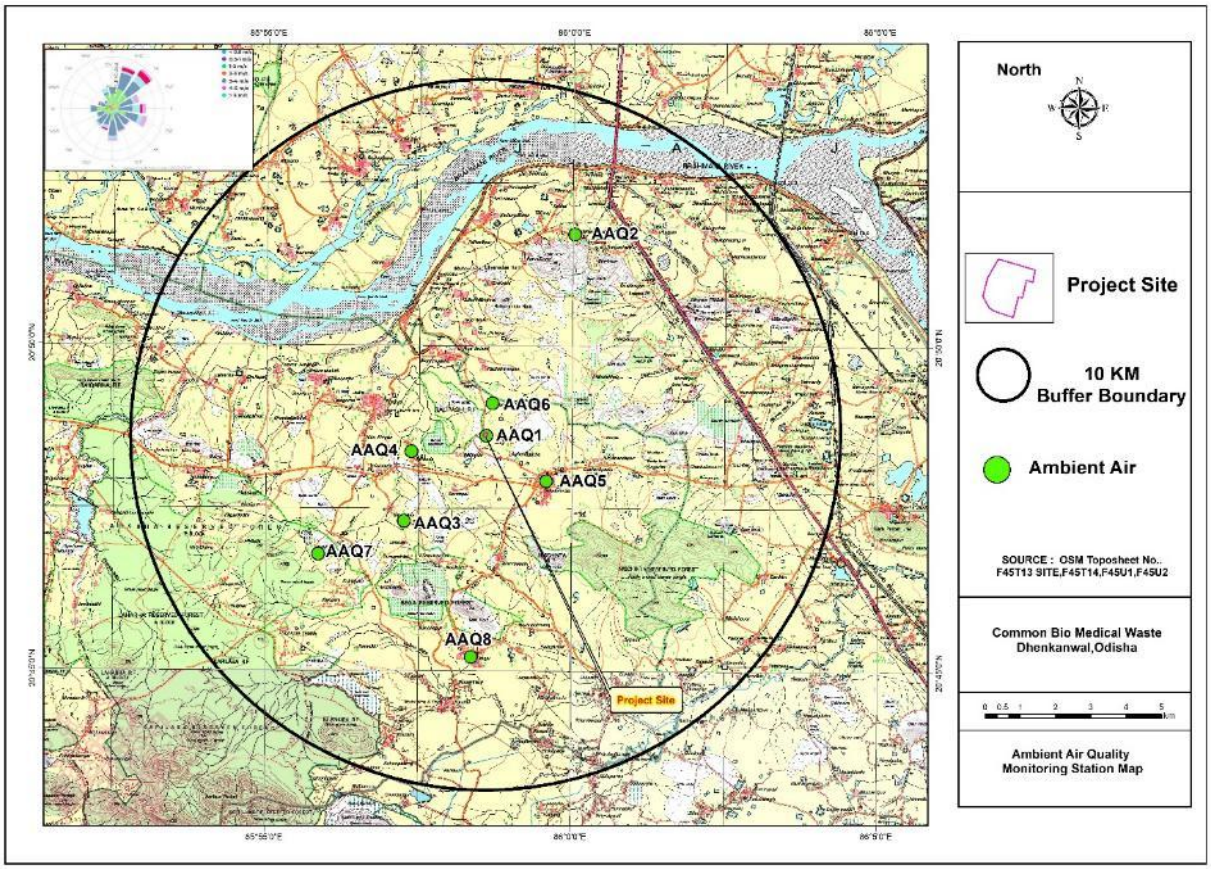


Figure 3-4: Air Monitoring Locations

Table 3-4: Summarized Ambient Air Quality Result

Sampling Stations	PM10 (µg/m³)	PM2.5 (µg/m³)	SO2 (µg/m³)	NOx (µg/m³)	CO* (µg/m³)
AAQ-1: Project Site					
Min	53.4	27.8	4.5	9.6	110
Max	68.6	35.9	6.6	16.4	280
Average	62.0	32.3	5.4	12.5	193
98%tile	68.4	35.8	6.5	16.2	275
AAQ-2: Village Balrampur					
Min	56.6	24.5	5.0	10.1	140
Max	73.7	37.5	7.2	17.3	290
Average	64.7	30.4	5.9	13.4	195
98%tile	72.9	36.9	7.1	16.7	281
AAQ-3: Village Belamalia					
Min	53.1	26.6	6.1	9.9	140
Max	68.5	35.2	8.6	16.6	380
Average	62.4	30.8	7.1	12.7	255
98%tile	68.4	35.2	8.4	16.5	380

AAQ-4: Village Karanda					
Min	59.9	26.9	5.3	10.1	140
Max	76.3	34.6	8.6	17.4	360
Average	68.8	30.5	7.1	13.8	267
98%tile	75.7	34.4	8.6	17.2	360
AAQ-5: Village Nihalprasad					
Min	57.9	28.5	6.3	9.9	170
Max	74.7	40.1	8.5	16.5	390
Average	66.9	34.2	7.3	12.9	301
98%tile	74.6	39.6	8.5	16.4	390
AAQ-6: Asand Bahali (Sensitive-Near Forest)					
Min	52.9	24.2	5.4	9.1	110
Max	69.7	35.8	7.5	16.2	330
Average	63.1	30.7	6.4	12.6	246
98%tile	69.6	35.3	7.3	16.1	330
AAQ-7: Balikiari (Sensitive)					
Min	56.8	28.7	5.4	8.3	150
Max	70.4	37.5	7.9	15.2	390
Average	64.0	32.4	6.4	11.1	265
98%tile	70.0	37.5	7.7	15.0	390
AAQ-8: Bega (Habitation)					
Min	55.0	27.5	4.0	13.4	220
Max	71.3	35.5	6.8	18.3	370
Average	64.7	31.5	5.7	15.9	303
98%tile	71.2	35.3	6.8	18.3	370

The observations based on a perusal of the results for summer season are summarized below:

Respirable Particulate Matter (PM_{10}):

A maximum value of 76.3 µg/m^3 was observed at Village Balrampur (AAQ-2) and minimum value of 52.9 µg/m^3 was observed at Asand Bahali (Sensitive-Near Forest) (AAQ-6). The average values were observed to be in the range of 62.0 to 68.8 µg/m^3 and the 98% tile was observed by in the range of 68.4 to 75.7 µg/m^3.

Particulate Matter ($PM_{2.5}$):

A maximum value of 40.1 µg/m^3 was observed at Village Nihalprasad (AAQ-5) and minimum value of 24.2 µg/m^3 was observed at Asand Bahali (Sensitive-Near Forest) (AAQ-6). The

average values were observed to be in the range of 30.4 to 37.5 µg/m^3 and the 98% tile was observed by in the range of 34.4 to 39.6 µg/m^3.

Oxides of Nitrogen (NO_2):

Maximum concentration of NO_2 is observed to be 18.3 µg/m^3 at Bega (Habition) (AAQ-8) and minimum value of 8.3 µg/m^3 observed at Balikiari (Sensitive) (AAQ-7). The average values were observed to be in the range of 11.1 to 15.9 µg/m^3 and the 98% tile was observed by in the range of 15.0 to 18.3 µg/m^3.

Sulphur Dioxide (SO_2):

Maximum concentration of SO_2 is observed to be 8.6 µg/m^3 at Village Karanda (AAQ-4) and minimum value of 4.0 µg/m^3 observed at Bega (Habition) (AAQ-8). The average values were observed to be in the range of 5.4 to 7.3 µg/m^3 and the 98% tile was observed by in the range of 6.4 to 8.6 µg/m^3.

Carbon Monoxide (CO):

Maximum concentration of CO is observed to be 390 µg/m^3 at Village Nihalprasad (AAQ-5) and minimum value of 110 µg/m^3 observed at Asand Bahali (Sensitive-Near Forest) (AAQ-6). The average values were observed to be in the range of 193 to 303 µg/m^3 and the 98% tile was observed by in the range of 275 to 390 µg/m^3.

3.6 Water Environment

The impact has been assessed on randomly selected surface and ground water sources falling within the impact zone. In order to assess the existing water quality, the water samples were collected from ten different locations within the study area and analyzed as per the procedure specified in standard methods for examination of water and wastewater published by American Public Health Association and Bureau of Indian Standards (APHA/BIS). Selected water quality parameters for water resources of the study area have been used for describing the water environment and assessing the impacts on it. To assess the water quality impacts, water resources in the impact area have been grouped into 2 classes.

- Ground water resources in the deeper strata of the ground
- Surface water resources

3.6.1 Surface Water

Surface water quality of nearby water bodies

Surface water samples from river and pond were collected and analyzed for physical, chemical and microbiological characteristics from five locations i.e, one sample was collected from core zone and four samples were collected from buffer zone. The details of surface water sampling stations w.r.t plant site area is represented in **Table 3.6 and Figure 3.5.**

Table 3-5: Surface Water Sampling Locations

S. No.	SW Location Code	Location	Co-ordinate	Distance (km)	Direction from plant site
1	SW1	Brahmani River (Up Stream)	20°50'36.37"N 85°57'17.26"E	4.2	NW
2	SW2	Brahmani River (Dn Stream)	20°50'21.70"N 85°56'49.51"E	4.3	NW

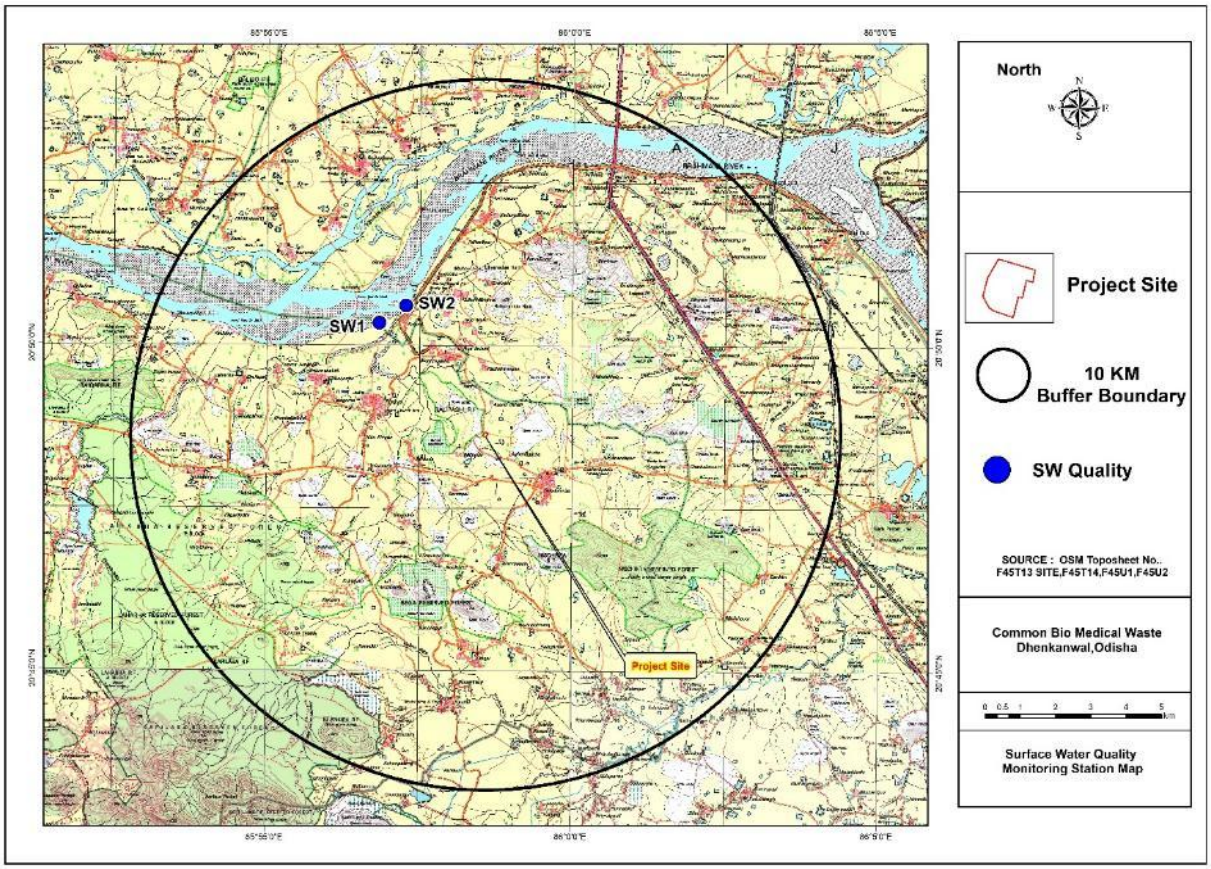


Figure 3-5 : Surface Water sampling Locations

Table 3-6: Surface Water Analysis Results

S. No.	Parameter	Unit	S.W.1	S.W.2
			Brahmani River Upstream	Brahmani River Downstream
1.	Color	Hazen	<5	<5
2.	Turbidity	NTU	10	12
3.	Temperature	^{0}C	19.3	19.5
4.	pH Value	-	7.63	7.57
5.	Dissolved Oxygen	mg/l	6.5	6.3
6.	Biochemical Oxygen Demand (BOD) 3 Days at 27^{0}C	mg/l	2.4	2.8
7.	Chemical Oxygen Demand	mg/l	10	12
8.	Total Dissolved Solids	mg/l	200	210
9.	Total Hardness (as $CaCO_3$)	mg/l	123	131
10.	Total Alkalinity (as $CaCO_3$)	mg/l	93	101
11.	Chlorides (as Cl)	mg/l	37	38
12.	Fluoride (as F)	mg/l	0.53	0.56
13.	Calcium (as Ca^{2+})	mg/l	30	31
14.	Magnesium (as Mg^{2+})	mg/l	12	13
15.	Sodium (as Na^{+})	mg/l	19	21
16.	Potassium (as K^{+})	mg/l	2.2	2.5
17.	Sulphate (as SO_4)	mg/l	18	20
18.	Total Kjeldahl Nitrogen (as N)	mg/l	1.1	1.2
19.	Free Ammonia (as NH_3)	mg/l	0.05	0.06
20.	Nitrate (as NO_3)	mg/l	0.9	1.1
21.	Silica (as SiO_2)	mg/l	10	9
22.	Phosphate (as PO_4)	mg/l	0.3	0.5

23.	Iron (as Fe)	mg/l	0.32	0.33
24.	Aluminum (as Al)	mg/l	<0.01	<0.01
25.	Boron (as B)	mg/l	<0.01	<0.01
26.	Copper (as Cu)	mg/l	<0.01	<0.01
27.	Manganese (as Mn)	mg/l	<0.01	<0.01
28.	Zinc (as Zn)	mg/l	<0.01	<0.01
29.	Selenium (as Se)	mg/l	<0.01	<0.01
30.	Arsenic (as As)	mg/l	<0.01	<0.01
31.	Cadmium (as Cd)	mg/l	<0.01	<0.01
32.	Total Chromium (as Cr^{3+})	mg/l	<0.01	<0.01
33.	Cyanide (as CN)	mg/l	<0.01	<0.01
34.	Lead (as Pb)	mg/l	<0.01	<0.01
35.	Mercury (as Hg)	mg/l	<0.001	<0.001
36.	Nickel (as Ni)	mg/l	<0.01	<0.01
37.	Total Suspended Solids	mg/l	16	19
38.	Sodium Adsorption Ratio	-	0.7	0.8
39.	Phenolic Compounds (as C_6H_5OH)	mg/l	<0.001	<0.001
40.	Anionic Detergent (as MBAS)	mg/l	<0.01	<0.01
41.	Specific Conductivity	µS/cm	300	320
Micro				
42.	Total Coliform	MPN/100ml	240	290
43.	Faecal Coliform	MPN/100ml	80	110

3.6.2 Ground Water

As per study, the ground water potential of the project site comes under good category and the study area mostly comes under good ground water potential.

During pre-monsoon period, the depth of water level ranges from 5 m–8 m below ground level and during post monsoon period ranges from 3 m–5 m below ground level.

Details of ground water sampling stations are represented in **Table 3.8** and **figure 3.6**. Ground water samples were collected and analyzed for physical, chemical and microbiological characteristics. The analysis result is presented in **Table 3.9**.

Table 3-7: Ground Water Sampling Locations

GW Sampling Location code	Location	Water source	Co-ordinates	Distance (km)	Direction from plant site
GW1	Project Site	Tube well	20°48'37.65"N 85°58'34.58"E	0	-
GW2	Balrampur	Tube well	20°51'44.34"N 85°59'59.66"E	6.2	NE
GW3	Belamalia	Tube well	20°47'12.12"N 85°57'10.06"E	3.8	SW
GW4	Karanda	Tube well	20°48'6.90"N 85°57'24.22"E	2.2	WSW
GW5	Nihalprasad	Tube well	20°47'56.03"N 85°59'38.75"E	2.2	ESE
GW6	Asand Bahali	Tube well	20°49'12.32"N 85°58'32.36"E	1.0	N
GW7	Balikiari	Tube well	20°46'49.44"N 85°55'45.47"E	5.9	SW
GW8	Bega	Tube well	20°45'5.61"N 85°58'33.06"E	6.4	S

Table 3-8: Ground Water Analysis Results

Ground water Quality DEC-2024												
S. No	**Parameter**	**Unit**	**Standard Limit (IS-10500:2012, RA 2018)**		**GW1**	**GW2**	**GW3**	**GW4**	**GW5**	**GW6**	**GW7**	**GW8**
			Desirable Limit	**Permissible Limit**	**Borewell Near Project site**	**Borewell Balrampur**	**Borewell Belamalia**	**Borewell Karanda**	**Borewell Nihalprasad**	**Borewell Asand Bahali (Sensitive-Near Forest)**	**Borewell Balikiari (Sensitive)**	**Borewell Bega (Habitiion)**
1	Colour	Hazen	5	15	<5	<5	<5	<5	<5	<5	<5	<5
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity	NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1
4	pH	-	6.5-8.5	No Relaxation	6.97	7.87	7.33	7.59	7.54	7.09	7.89	7.58
5	Total Dissolved Solids (TDS)	mg/l	500	2000	267	445	319	157	306	181	374	255
6	Total Hardness (as CaCO3)	mg/l	200	600	170	248	176	97	193	128	187	169
7	Total Alkalinity (as CaCO3)	mg/l	200	600	153	203	160	74	146	110	170	153

8	Chlorides (as Cl)	mg/l	250	1000	46	67	73	33	76	28	94	45
9	Fluoride (as F)	mg/l	1	1.5	0.05	0.53	0.33	0.07	0.21	0.22	0.03	0.09
10	Calcium(as Ca2+)	mg/l	75	200	41	60	42	23	46	31	45	40
11	Magnesium (as Mg2+)	mg/l	30	100	16	24	17	9	19	12	18	16
12	Sulphate (as SO4)	mg/l	200	400	10.6	63	8.7	10.9	6.9	6.7	12.8	4.6
13	Nitrate (as NO3)	mg/l	45	No Relaxation	5.4	5.3	5.5	5.8	4.4	5.3	4.9	4.7
14	Iron (as Fe)	mg/l	1	No Relaxation	0.41	0.63	0.45	0.35	0.63	0.51	0.67	0.56
15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Boron (as B)	mg/l	0.5	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Zinc (as Zn)	mg/l	5	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
30	Silica (as SiO_2)	mg/l	,---	,---	8.6	5.4	6.3	4.7	7.6	8.3	5.6	5.9

31	Phosphate (as PO_4)	mg/l	,---	,---	0.2	0.4	0.1	0.06	0.07	0.05	0.2	0.3
32	Specific Conductivity	µS/cm	,---	,---	400	667	478	236	458	272	560	382
Bacteriological Parameter												
1	Total Coliform	MPN/ 100ml	Shall not be detectable in any 100ml Sample		Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)
2	E.coli	MPN /100ml	Shall not be detectable in any 100ml Sample		Absent (<2)	Absent (<2)	Absent (<2)	Absent (<2)	Absent (<2)	Absent (<2)	Absent (<2)	Absent (<2)

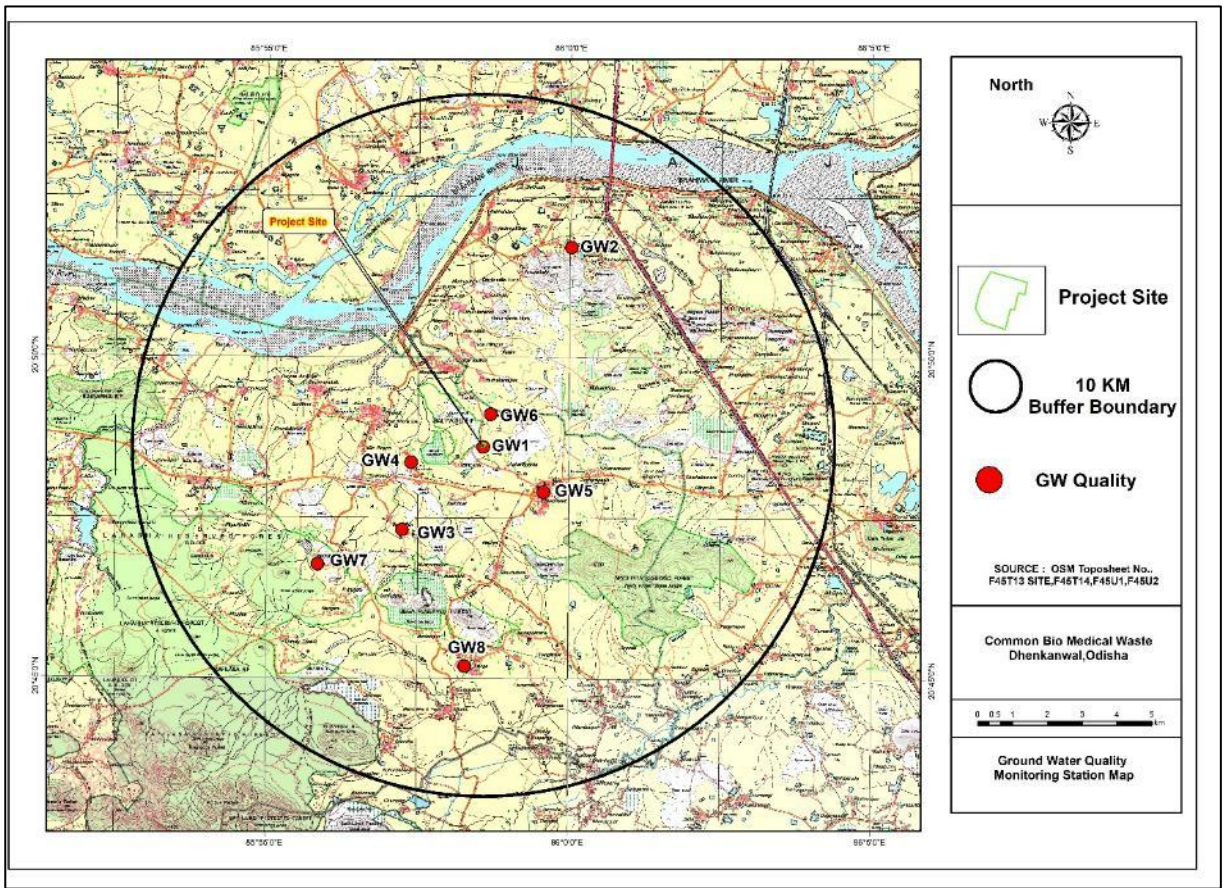


Figure 3-6: Ground Water sampling Locations

3.6.3 Result & Discussion

Ground Water Quality

The pH values observed were in the range of 6.97 to 7.89; with total dissolved solid ranging from 157 mg/l to 445 mg/l. Total Hardness was in the range of 97 mg/l to 248 mg/l. The concentration of alkalinity was in the range of 74 to 203 mg/l.

Surface Water Quality

The pH values observed were in the range of 7.57 to 7.63 with total dissolved solids in the range of 200 mg/l to 210 mg/l. BOD were observed less than 28.5 mg/l. Chloride varied between 37 mg/l to 38 mg/l. Sulphates varied from 18 to 20 mg/l, Nitrate varied from less than 0.9 to 1.1 mg/l.

3.7 Noise Environment

The baseline study for noise environment has been carried out through reconnaissance in the impact zone, identification of representative sampling locations and monitoring of prevailing noise levels during the study period. Details of noise monitoring locations w.r.t project site is given in the **Table 3.10** and **Figure 3.7**. The analysis result is given in **Table 3.11.**

Table 3-9: Noise Monitoring Location

S. No.	Noise sampling Location Code	Location	Co ordinates	Distance (Km)	Direction
1	N1	Project Site	20°48'37.65"N 85°58'34.58"E	0	Centre
2	N2	Balrampur	20°51'44.34"N 85°59'59.66"E	6.2	NE
3	N3	Belamalia	20°47'12.12"N 85°57'10.06"E	3.8	SW
4	N4	Karanda	20°48'6.90"N 85°57'24.22"E	2.2	WSW
5	N5	Nihalprasad	20°47'56.03"N 85°59'38.75"E	2.2	ESE
6	N6	Asand Bahali	20°49'12.32"N 85°58'32.36"E	1.0	N
7	N7	Balikiari	20°46'49.44"N 85°55'45.47"E	5.9	SW
8	N8	Bega	20°45'5.61"N 85°58'33.06"E	6.4	S

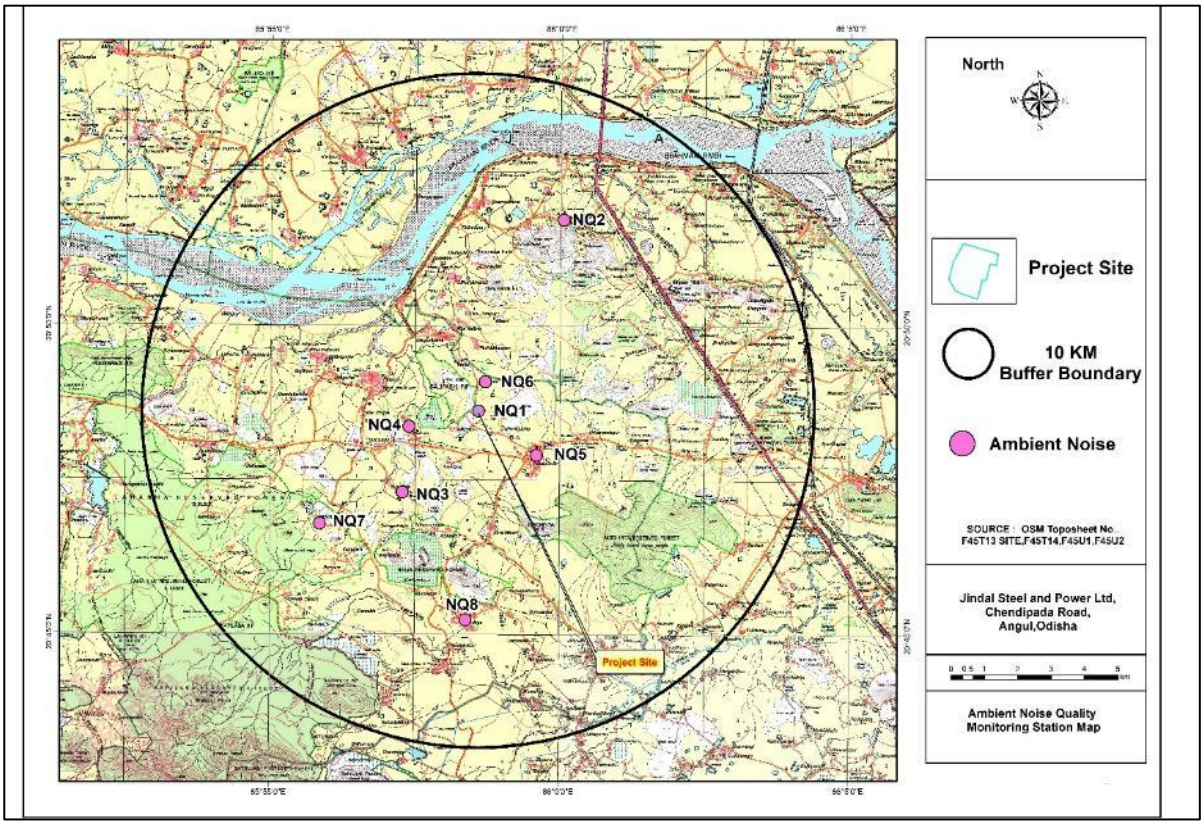


Figure 3-7: Noise Sampling Locations

Table 3-10: Noise level monitoring result (dBA)

Noise Quality Data (DEC-2024)						
S. No.	**Location**	**ZONE**	**LIMIT as per CPCB Guidelines Leq, dB(A)**		**Observed value Leq, dB(A)**	
			DAY*	**NIGHT****	**DAY***	**NIGHT****
1	Project Site	Industrial Area	75	70	40.7	36.5
2	Balrampur	Residential Area	55	45	43.8	38.7
3	Belamalia	Residential Area	55	45	42.3	39.6
4	Karanda	Residential Area	55	45	40.3	38.5
5	Nihalprasad	Residential Area	55	45	52.7	43.6
6	Asand Bahali	Residential Area	55	45	40.5	36.8
7	Balikiari	Residential Area	55	45	42.8	38.7
8	Bega	Residential Area	55	45	50.6	39.8
*	Day time	(6.00AM TO 10.00PM)				
**	Night time	(10.00PM TO 6.00AM)				

Table 3-11: Ambient Noise Standard

Area Code	Category of Area	Noise Levels dB(A) eq	
		Day time*	**Night time**
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence**	50	40

3.8 Soil Environment

Different types of Soils found within the Project Study Area were observed with the help of recently prepared "LU/LC" map of the same in association with the latest relevant google earth images. Site inspections were conducted to confirm the facts on the ground. Soil sampling locations were fixed based on the said preliminary assessment of the Study Area. The soil sampling location details are presented in **Table 3.13 and Figure 3.8.**

The present study of the soil profile establishes the baseline characteristics and this will help in future identification of the incremental concentrations if any, due to the operation of the plant. The sampling locations have been identified with the following objectives:

- To determine the base line characteristics of the soils in terms of Physical and Chemical properties important for crop cultivation.
- To determine the possible impact of the project on soil erosion and soil degradation.

Table 3-12: Soil Sampling Locations

S. No.	Sampling Code	Soil Location	Co-ordinate	Distance (km)	Direction from plant site
1	S1	Project Site	20°48'37.65"N 85°58'34.58"E	0	-
2	S2	Balrampur (Up Wind)	20°51'44.34"N 85°59'59.66"E	6.2	NE
3	S3	Belamalia (Dn Wind)	20°47'12.12"N 85°57'10.06"E	3.8	SW
4	S4	Karanda (Cross Wind)	20°48'6.90"N 85°57'24.22"E	2.2	WSW
5	S5	Nihalprasad (Cross Wind)	20°47'56.03"N 85°59'38.75"E	2.2	ESE
6	S6	Asand Bahali (Sensitive-Near	20°49'12.32"N 85°58'32.36"E	1.0	N
7	S7	Balikiari (Sensitive)	20°46'49.44"N 85°55'45.47"E	5.9	SW
8	S8	Bega (Habition)	20°45'5.61"N 85°58'33.06"E	6.4	S

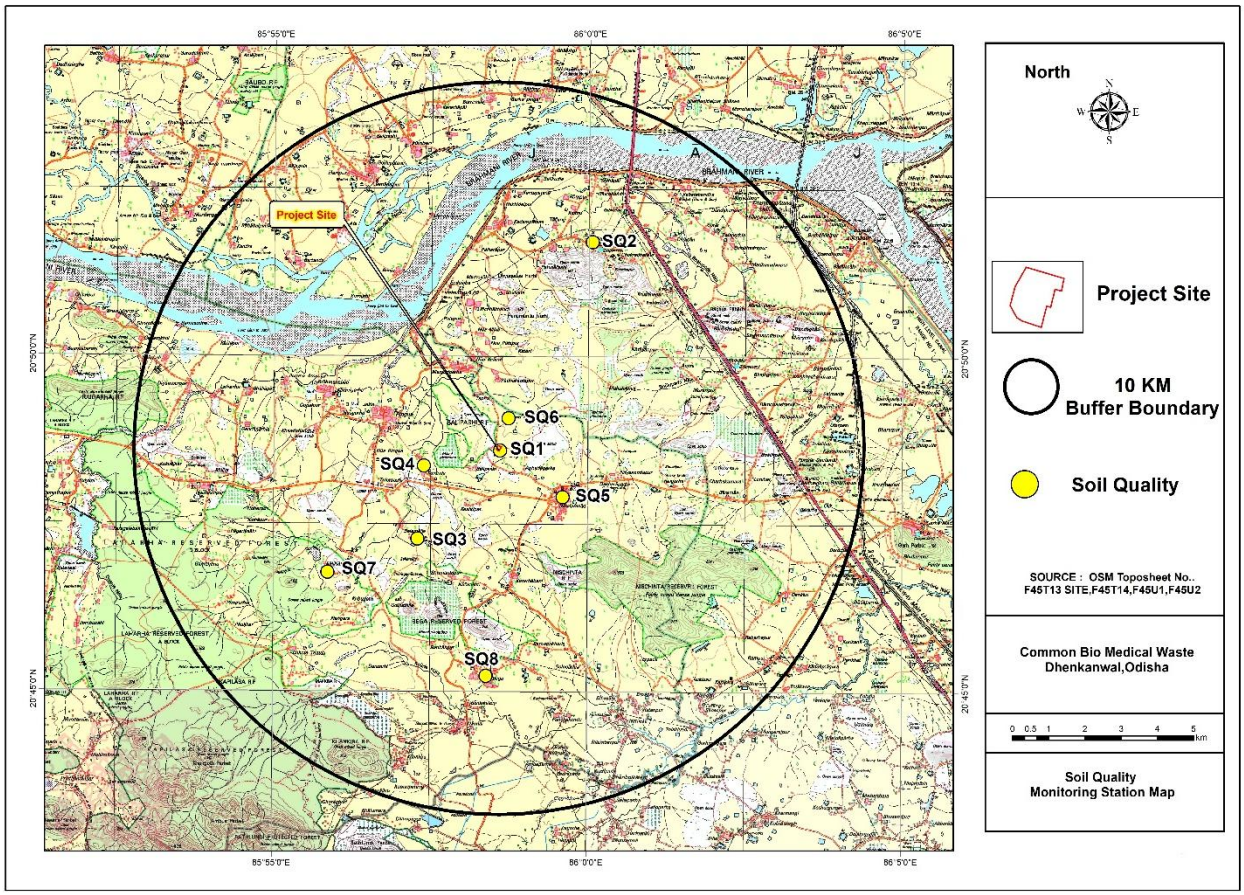


Figure 3-8: Soil Sampling Location

The summarized soil analysis result is represented in **Table 3.16**.

Table 3-13: Soil Analysis Result

Soil Quality Data (DEC-2024)										
			SQ1	**SQ2**	**SQ3**	**SQ4**	**SQ5**	**SQ6**	**SQ7**	**SQ8**
S.No	**Parameter**	**Unit**	**Project Site**	**Balrampur**	**Belamalia**	**Karanda**	**Nihalprasad**	**Asand Bahali (Sensitive-Near Forest)**	**Balikiari (Sensitive)**	**Bega (Habition)**
1	Texture	-	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
2	Particle Size Distribution									
	Sand	%	45.8	47.6	44.8	43.6	48.7	49.2	46.7	49.3
	Silt	%	15.5	16.7	18.3	16.8	17.5	14.3	14.7	13.2
	Clay	%	38.7	35.7	36.9	39.6	33.8	36.5	38.6	37.5
3	pH (1:2 Suspension)	-	7.83	6.83	6.99	7.16	7.45	7.49	6.89	6.78
4	Electrical Conductivity (1:2 Suspension)	µS/cm	183	179	193	187	175	221	197	171
5	Moisture Content	%	10.9	9.7	10.6	11.7	8.9	11.8	10.3	9.1
6	Cation Exchange Capacity	meq/100gm	14.3	14.3	14.4	14.7	14.3	14.7	16.6	14.6
7	Available Potassium (as K)	mg/kg	43	47	44	48	53	57	63	54

8	Exchangeable Sodium (as Na)	mg/kg	157	148	152	143	144	122	140	139
9	Exchangeable Calcium (as Ca)	mg/kg	1971	1980	1983	1996	1982	2084	2347	1987
10	Exchangeable Magnesium (as Mg)	mg/kg	442	436	451	478	430	431	487	470
11	Sodium Absorption Ratio	-	0.83	0.78	0.80	0.74	0.76	0.63	0.68	0.73
12	Organic Matter	%	0.89	0.81	0.93	0.9	0.86	0.87	0.93	0.92
13	Total Nitrogen (as N)	mg/kg	40	43	41	39	38	44	42	45
14	Nitrate (as NO_3)	mg/kg	13.2	12.4	9.8	11.9	13.8	15.2	16.4	13.7
15	Total Phosphorus (as PO_4)	mg/kg	6.9	5.3	6.4	6.3	7.1	7.8	7.9	6.8
16	Iron (as Fe)	mg/kg	8.1	6.3	6.5	7	11.2	8.4	6.3	6.9
17	Zinc (as Zn)	mg/kg	4.6	3.8	4.6	4.1	3.5	2.6	2.8	2.3
18	Copper (as Cu)	mg/kg	2.3	3.1	2.4	2	3.2	2.4	2.3	2.0
19	Boron (as B)	mg/kg	0.2	0.5	0.3	0.4	0.7	0.85	1.6	1.3
20	Manganese (as Mn)	mg/kg	26	25	30	33	27	8.6	23.7	9.6

21	Water Holding Capacity	%	30.3	29.8	33.5	33.8	32.7	30.9	30.4	25.9
22	Permeability	cm/hr	2.1	2.1	1.9	1.9	2.1	2.1	2.2	2.4
23	Porosity	%	26.7	27.3	26.8	27.4	28.9	28.6	34.6	39.8
24	Bulk Density	gm/cc	1.41	1.43	1.44	1.45	1.43	1.38	1.36	1.38

3.8.1 Observations

It has been observed that the pH of the soil ranged from 6.78 to 7.49 indicating that the soils are slightly alkaline to moderately alkaline in nature. The electrical conductivity was observed to be in the range of 171 to 221 µS/cm.

The nitrogen concentrations are in the range of 38 to 45 mg/kg. The phosphorous concentrations are in the range from 5.3 to 7.9 mg/kg.

3.9 Bio-Diversity

An ecological study of the ecosystem is essential to understand the impact of industrialization and urbanization on existing flora and fauna of the study area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for under taking appropriate action to mitigate the impact, if any. The biological study was under taken as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area, to compare it with past condition with the help of available data, to predict changes in the biological environment as a result of present activities and to suggest measures for maintaining its health. A secondary information was conducted to study the flora & fauna in 10 km radius. Some of the information was gathered from the local habitants. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region.

During secondary information, following aspects were considered for ecological studies:

- Assessment of present status of flora and fauna;
- Identification of rare and endangered species of plants and animals;
- Identification of ecologically sensitive areas within the study area;
- Assessment of migratory route of wildlife, etc.

Methodology Adopted for the Study of Flora and Fauna

SoP followed: As per QMS of GRC

Core Zone: Project site

Buffer Zone: 10 km radius

Study Period: October to December 2024

Format/Checklist: As per QMS of GRC.

Floristic composition within the study area

The study area shows a high diversity of species, including trees, shrubs, and fruit bearing plants. This diversity supports a variety of ecological functions and services, such as habitat provision, food resources, and cultural significance. Many of these species play crucial roles in their ecosystems. For example, Ficus species are known for their importance in tropical forests as keystone species providing food for a variety of animals. Some species might require conservation efforts due to their status or ecological importance. For instance, further

study might be needed for those classified as Data Deficient to ensure their populations are not declining unnoticed. This detailed inventory serves as a basis for ecological studies, conservation planning, and sustainable management of the area's natural resources.

The study area boasts a rich diversity of plant species, including trees, shrubs, and fruit bearing plants. This high level of biodiversity suggests a robust and resilient ecosystem capable of supporting a wide variety of wildlife and providing numerous ecological services.

1. Keystone Species: Ficus species (e.g., *Ficus bengalensis, Ficus religiosa, Ficus glomerata*) are crucial as they produce fruit year-round, supporting many animal species. Their presence indicates a healthy, stable ecosystem.
2. Food Resources: Fruit bearing trees like *Mangifera indica* (Mango), *Musa sapientum* (Banana), and Artocarpus heterophyllus (Jackfruit) are essential for both wildlife and human communities, providing food and contributing to the local economy.
3. Medicinal and Cultural Importance: Many species, such as *Azadirachta indica* (Nima) and *Terminalia arjuna* (Arjun), have traditional medicinal uses. This underscores the cultural and practical importance of preserving these species.

Ecological and Conservation Priorities

1. Habitat Preservation: Protecting diverse habitats is critical for maintaining the plant species diversity. Efforts should focus on conserving existing forests and preventing habitat fragmentation.

2. Research and Monitoring: Continued research to fill data gaps, especially for Data Deficient species, is vital. Regular monitoring of population trends will help in making informed conservation decisions.

3. Sustainable Use and Management: Encouraging sustainable harvesting practices and community-based management can ensure that plant species are used responsibly without compromising their ecological roles.

4. Restoration Initiatives: Reforestation and habitat restoration projects should prioritize native species to maintain the ecological integrity of the area.

Human Impact and Interaction

1. Agricultural Practices: Many species are integral to local agriculture (e.g., *Cocos nucifera* (Coconut), *Psidium guajava* (Guava)). Sustainable agricultural practices should be promoted to balance productivity and conservation.

2. Cultural Significance: Species with cultural and medicinal importance (e.g., *Aegle marmelos* (Bela), *Emblica officinalis* (Amla)) highlight the need for conservation strategies that incorporate traditional knowledge and community involvement.

3. Economic Benefits: Fruit bearing and timber species contribute to the local economy. Sustainable management of these resources can provide long term economic benefits while preserving biodiversity.

The floral diversity in the study area reflects a complex and vibrant ecosystem with significant ecological, cultural, and economic value. Conservation efforts should focus on protecting habitats, conducting comprehensive research, promoting sustainable use, and involving local communities in preservation activities. By addressing the specific needs and statuses of various species, the overall health and resilience of the ecosystem can be maintained for future generations.

List of flora reported/observed in the study area is given in table below-

List of flora Reported/observed in the study area

A. Trees:			
S. No.	**Scientific Name**	**Common/local Name**	**Family**
1	*Mangifera indica*	Mango	Anacardiaceae
2	*Delonix regia*	Gulmohar	Caesalpiniae
3	*Tamarindus indica*	Tamarind	Caesalpiniae
4	*Cassia siamea*	Bada Chakunda	Caesalpiniae
5	*Acacia nilotica*	Babul	Mimosaceae
6	*Ficus bengalensis*	Banyan	Moraceae
7	*Ficus religiosa*	Peepal	Moraceae
8	*Syzygium cumini*	Jamu koli	Myrtaceae
9	*Eucalyptus globulus*	Eucalyptus	Myrtaceae
10	*Cocos nucifera*	Coconut palm	Palmae
11	*Aegle marmelos*	Wood apple	Rutaceae
12	*Azadirachta indica*	Neem	Meliaceae
13	*Mimusops elengi*	Bakul	Zapotaceae
14	*Psidium guajava*	Guava	Myrtaceae
15	*Tectona grandis*	Teak	Verbanaceae
16	*Naringi crenulata*	Benta (Behenta)	Rutaceae
17	*Crateva magna*	Baruna	Capparaceae
18	*Anogeissus latifolia*	Dhaura	Combretaceae
19	*Acacia leucophloea*	Gohira	Mimosaceae
20	*Bombax ceiba L*	Simuli	Bombacaceae
21	*Borassus flabellifer*	Tala	Arecaceae

22	*Dendrocalamus strictus*	Salia Baunso	Poaceae
23	*Plumeria rubra*	Katha Champa	Apocynaceae
24	*Alangium*	Ankula	Alangiaceae
25	*Terminalia arjuna*	Arjuna	Combretaceae
26	*Carica papaya*	Bhanda	Caricaceae
27	*Pithecellobium duke*	Simakanya	Mimosaceae
28	*Dillenia indica*	Ou	Dilleniaceae
B. Shrubs:			
S. No.	**Scientific Name**	**Common Name**	**Family**
1	*Zizyphus oenoplia*	Koli	Rhamnaceae
2	*Flacourtia indica*	Bhaincha	Flacourtiaceae
3	*Murraya koengii*	Bhursunga	Rutaceae
4	*Lantana camara*	Naguari	Verbinaceae
5	*Chromolaena odorata*	Pokasungha	Asteraceae
6	*Pandanus fascicularis*	Kia	Pandanaceae
7	*Euphorbia ligularia*	Shiju	Euphorbiaceae
8	*Musa paradisiacal*	Kadali	Musaceae
9	*Ervatamia*	Tagara	Apocynaceae
10	*Ipomoea cornea*	Amari	Convolvulaceae
11	*Asparagus*	Satabari	Liliaceae
12	*Hibiscus rosa*	Mandara	Malvaceae
C. Herbs & Climbers:			
S. No.	**Scientific Name**	**Common Name**	**Family**
1	*Phoenix acaulis*	Bana khajuri	Arecaceae
2	*Calotropis procera*	Arakha	Asclepidaceae
3	*Vertiveria*	Bena ghasa	Poaceae
Endangered species: Nil ***Endemic Species: Nil***			

N.B. DD - Data Deficient, LC – Least Concern/ Lower Risk, VU- Vulnerable, EN – Endangered, NT- Near Threatened, (-) – This taxon has not yet been assessed for the IUCN Red List (IUCN Red List of Threatened Species, 2022)

Source: Saxena HO, Brahmam M (1996). The Flora of Orissa, Vol I-IV. Orissa Forest Development Corporation Limited, Bhubaneswar. India pp. 89- 1735.

Fauna in the study area

Birds

The study area hosts a variety of bird species, showcasing a rich avian diversity. The list includes 24 species, each with its local and scientific names, as well as their conservation status according to the IUCN and their schedule under the Wildlife Protection Act (India). *Pavo cristatus* (Peacock) & *Milvus migrans* is listed under Schedule I of the Wildlife Protection

Act, indicating the highest level of protection due to its significance and potential vulnerability.

Habitat Preservation: Protecting the habitats of these bird species is crucial. Forests, wetlands, and other natural habitats need to be conserved to ensure the survival and health of these avian populations.

Human Impact: The presence of common birds like *Passer domesticus* (Gharchatia) and *Columba livia* (Ghumura Para) suggests human altered environments. Measures should be taken to minimize negative human impacts on bird habitats.

The study area supports a diverse avian community with many species classified as Least Concern by the IUCN, indicating stable populations. However, the presence of species with unclear conservation statuses highlights the need for further research and habitat conservation efforts. Effective implementation of legal protections and sustainable habitat management are essential to preserve this rich bird diversity.

A comparative chart of the total bird species belonging to different families along with their feeding preference and abundance are provided in Table below.

Avifauna in study area

S. No.	Common English Name	Species (Scientific Name)	Family	Schedule
1	Small green Bee eater	*Merops orientalis*	Meropidae	II
2	Blue tailed Bea eater	*Merops philippinus*	Meropidae	II
3	Jungle fowl	*Gallus gallus*	Phasianidae	II
4	House Fowl	*Gallus domesticus*	Phasianidae	II
5	Bramhiny Starling	*Sturnus pagodarum*	Sturnidae	II
6	Indian Myna	*Acridotheres tristis tristis*	Sturnidae	II
7	Blue Jay (Indian roller)	*Coracias benghatensis*	Coraciidae	IV
8	Eastern Skylark	*Alauda arvensis*	Alaudidae	II
9	White browed Bulbul	*Pycnonotus luteolus*	Pycnonotidae	II
10	Bramhiny Duck	*Tadorna ferruginea*	Anatidae	II
11	Blossom headed parakeet	*Psittacula roseata*	Psittacidae	II
12	Rose ringed Parakeet	*Psittacula krameri borealis*	Psittacidae	II
13	Paddy field pipit	*Anthus rufulus*	Motacillidae	II

14	Brown rock pipit	*Anthus similes*	Motacillidae	II
15	Spotted Dove	*Streptopelia chinensis*	Columbidae	II
16	Oriental magpie Robin	*Copsychus saularis*	Muscicapidae	II
17	Jungle crow	*Corvus macrorhynchos culminates sykes*	Corvidae	IV
18	House sparrow	*Passer domesticus*	Passeridae	IV
19	Eurasian eagal-owl	*Bubo bubo*	Strigidae	II
20	BIue rock Pigeon	*Columba livia*	Clumbidae	II
21	Red vented bulbul	*Pycnonotus cafer*	Pycnonotidae	II
22	Jungle Myna	*Acridotheres fuscus*	Sturnidae	II
23	Common Quail	*Coturnix coturnix*	Phasianidae	II
24	Black headed oride	*Oriolus xanthornus*	Oriolidae	II
25	Golden Oriole	*Oriolus oriolus*	Oriolidae	II
26	Black drongo (King crow	*Dicrurus macrocercus*	Dicruridae	IV
27	Indian Pond heron	*Ardeola grayii*	Ardeidae	II
28	Brown Fish owl	*Ketupa zeylonensis*	Sturnidae	I
29	House crow	*Corvus splendens*	Corvidae	-
30	Little Egret	*Egretta garzetta*	Ardeidae	IV
31	Asian Koel	*Eudynamys scolopacea*	Cuculidae	II
32	Screech owl (Barn owl)	*Tyto alba*	Strigidae	I
33	Shall Blue Kingfisher	*Alcedo atthis bengalensis*	Alcedinidae	II
34	White necked stork	*Ciconia episcopus*	Ciconiidae	II
35	Pariah kite (Black kite)	*Milvus migrans*	Accipitridae	I
36	White throated	*Lonchura malabarica*	Ploceidae	II
37	White rumped Munia	*Lonchura striata*	Ploceidae	II
38	Indian Myna	*Acridotheres tristis*	Sturnidae	II
39	Common Sandpiper	*Actitis hypoleucos*	Charadriidae	II
40	Pied crested cuckoo	*Clamator jacobinus*	Cuculidae	II
41	Indian Plaintive Cuckoo	*Cacomantis passerinus*	Cuculidae	II

LC- Least Concern, NT- Near Threatened, EN- Endangered, NE-Not Evaluated, DD -Data Deficient, VU-Vulnerable, IUCN- International Union for Conservation of Nature.

Butterflies from the study area: Butterflies from three families observed during the present study are documented in the table below.

Butterflies in the Study Area

Scientific Name and Family	Common Name	Relative Abundance
Family Papilionidae		
Papilio polytes	Common Mormon	Common
Family Pieridae		
Eurema hecabe	Common Grass yellow	Very Common
Catopsilia crocale	Common Emigrant	Common
Family: Nymphalidae		
Danaus chrysippus	Plain Tiger	Common
Phalantha phalantha	Common Leopard	Fairy Common
Mycalesis perseus	Common bush brown	Uncommon
Ariadne merione	Common Caster	Uncommon
Precis lemonias	Lemon pansy	Common
Junonia orithya Linnaeus	Blue pansy	Fairy Common

Herpetofauna: In amphibian group, the toads were sighted during the study period. The reptile, Common Garden Lizard and Fan-Throated Lizard, Common rat Snake and were observed in the region is given in the table below.

Reptiles and Amphibian in Study Area

S.No.	Family	Common Name	Scientific name	Schedule as IWPA, 1972
1.	Agamidae	Common Garden Lizard	*Calotes versicolor* (Cuvier, 1817)	Not listed
2.		Fan-Throated Lizard	*Sitana ponticeriana* (Cuvier, 1817)	Not listed
3.	Bufonidae	Toad	*Bufo bufo* (Gray 1825)	Not listed
4.	Chamaeleonidae	Indian chameleon	*Chameleon calcaratus* (Rafinesque, 1815)	Schedule I
5.	Colubridae	Common Rat Snake	*Ptyas mucosus* (Linnaeus, 1758)	Schedule I
6.	Elapidae	Common Indian Krait*	*Bungarus caeruleus (*Schneider, 1801*)*	Schedule I
7.		Indian Cobra*	*Naja naja* (Linnaeus, 1758)	Schedule I
8.	Viperidae	Russell's Viper	*Vipera russelli*	Schedule I
9.	Sciencidae	Bramhiny	*Mabuya carinata*	-
10.	Gekkonidae	Spotted Indian House Gecko	*Hemidactylus frenatus (Gray)*	-
11.		Tree Gecko	*Hemidactylus typus*	-
12.	Varanidae	Bengal monitor	*Varanus bengalensis*	Schedule I
13.		Yellow monitor lizard	*Varanus flavescens*	Schedule IV
14.	Colubridae	Common wolf snake	*Lycodon aulicus (Linn.)*	-
15.		Buffstriped Keelback	*Amphiesma stolatum (Linn.)*	Schedule IV

16.	Elapidae	Banded Krait	*Bungarus fasciatus*	Schedule IV
17.		Common Krait	*Bungarus caeruleus*	Schedule IV

*Not sighted but included as per the secondary information from the villagers.

Mammals

The wild mammals observed other than the domesticated ones are given in the table below.

Mammals in Study Area

S.No.	Family	Common Name	*Scientific name*	Status as per IWPA 1972
1.	Canidae	Small Fox	*Vulpes bengalensis*	Schedule I
2.	Herpestidae	Common Mongoose	*Herpestes edwardsii (É. Geoffroy Saint-Hilaire, 1818)*	Schedule II
3.	Cercopithecidae	Monkey	*Macaca mulatta*	-
4.		Common langur	*Semnopithecus entellus (*Dufresne, 1797)	Schedule II
5.	Teropodidae	Short nosed Fruit Bat	*Cynopterus sphinx*	-
6.	Muridae	Common Indian Rat	*Rattus rattus (Linn.)*	-
7.		Field Rat	*Rattus norvegicus (Linneaus 1758)*	-
8.	Sciuridae	5 striped Palm Squirrel	*Funambulus pennanti* (Wroughton, 1905)	-

Domestic Animals: The domestic animals *viz*. dog, cow, buffalo, goat, sheep and chicken observed in the study area.

Insect: There is no significant faunal assemblage here except for some insects like Honey Bees (*Apis sp*.) and Gum leaf Grasshopper (*Goniaea australasiae)*. Some invertebrates are seen such as earthworms, snails, prawns, crabs, houseflies, butterflies, mosquitoes, wasps, mantis, ants, termites etc.

Aquatic Fauna

The study area mainly drained by Brahmini River. During the field survey both inland pond fishes and riverian fishes were recorded with interaction with villagers and fishermen. A detailed checklist of fresh water fishes are given in the table below-.

Fishes within Study area

S. No.	Common Name	Scientific Name	Family
1	Bhakur	*Catla catla (Hamilton)*	Cyprinidae
2	Mrigal	*Cirrhinus mrigala (Hamilton)*	Cyprinidae
3	American rui	*Cyprinus carpio (Linnaeus)*	Cyprinidae
4	Rohu	*Labeo rohita (Hamilton)*	Cyprinidae
5	Bata	*Labeo bata (Hamilton)*	Cyprinidae

6	Kalbans	*Labeo kalbasu (Hamilton)*	Cyprinidae
7	Chanda	*Osteobrama cotio cotio*	Cyprinidae
8	Punthi	*Puntius saphori (Hamilton)*	Cyprinidae
9	Magur	*Clarius batracus (Linnaeus)*	Clariidae
10	Singi	*Heteropneustes fossilis (Bloch)*	*Heteropneusidae*
11	Shol	*Channa striatus (Bloch)*	*Channidae*
12	Chang	*Channa orientalis (Schneider)*	*Channidae*
13	Lata	*Channa punctatus (Bloch)*	*Channidae*
14	Koi	*Anabas testudineus (Bloch)*	*Anabantidae*
15	Todi	*Mastacembelus armatus*	*Mastacembelidae*
16	Balia	Wallago atu	*Siluridae*

PLANKTON

The plankton (phytoplankton and zoo plankton) was observed from sample collected and listed below:

Planktonic Abundance in Aquatic Environment

S. No	Phytoplankton	S.No.	Zooplankton
1	*Ulothrix sp*	1	*Pseudodiaptomus sp*
2	*Pithophora sp*	2	*Keratella sp*
3	*Desmids*	3	*Asplancha sp*
4	*Cosmarium sp*	4	*Brachonus sp*
5	*Pediastrum sp*	5	*Daphnia sp*
6	*Volvox sp*	6	*Cyclops sp*
7	*Navicula sp*	7	*Cypris sp*
8	*Pluerosigma sp*	8	*Diaptomus sp*
9	*Achnanthes sp*	9	*Pseudodiaptomus sp*
10	*Pinnularia sp*	-	
11	*Anabeana sp*	-	
12	*Scenedesmus biguga*	-	
13	*Ankistrodesmus falcatus*	-	
14	*Melosira sp*	-	
15	*Chlorococcum sp*	-	
16	*Chlorella sp*	-	
17	*Nitzschia sp*	-	
18	*Microcystis sp*	-	

RARE AND ENDANGERED FAUNA OF STUDY AREA

Some of the sighted fauna was given protection by the Indian Wild Life (Protection) Act, 1972 by including them in different schedules. Indian Cobra (*Naja naja*), Indian chameleon, Rat snake, Indian Krait, are provided protection as per Schedule-I of Wild life Protection Act, (1972/2022). No endemic species were recorded from study area.

Interpretation

Total 43 floral species were observed from study area. For the documentation of the faunal biodiversity of the study area with respect to birds, reptiles, amphibians and butterfly species, a baseline survey had been conducted. The study area has rich biodiversity including schedule – I species. Some of the mammals in study area are protected in different schedules as per Wildlife Protection Act 1972/2022. Conservation plan is recommended for the same.

Conservation Plan is attached as **Annexure-IV.**

3.9.1 Socio-Economic Status

3.9.1.1 Study Area

The study area, also known as Impact Area, has been defined as sum total of core and buffer area with a radius of 10 kilometers from the periphery of the project site. The study is based on secondary data mainly collected from Census 2011 and primary data collected through field study and Field Group Discussions.

The primary survey was conducted through Questionnaire specially designed to capture first hand, on the spot, information.

The study area comprises of district Dhenkanal in state Odisha.

3.9.1.2 Methodology

The study area comprises of 26 census villages with a total population of 11,312.

Demographic features of study area: Rural area

The villages falling within the study area are listed in table along with the demographic features as per the Census 2011.

Summary of Demographic features of Rural area under study

SL.NO.	Village	No_HH	TOT_P	TOT_M	TOT_F	P_06	M_06	F_06	P_SC	M_SC	F_SC	P_ST	M_ST	F_ST
1	Budhipani	24	102	53	49	20	10	10	0	0	0	15	7	8
2	Charbhati	248	941	492	449	134	76	58	17	6	11	478	249	229
3	Dangapal	242	945	482	463	100	52	48	171	90	81	292	143	149
4	Dhunkchhali	48	179	83	96	33	17	16	0	0	0	0	0	0
5	Haripur	52	252	130	122	33	18	15	1	1	0	233	120	113
6	Hatibahal	33	126	65	61	15	4	11	0	0	0	1	1	0
7	Hemamura	89	369	183	186	45	20	25	70	28	42	43	21	22
8	Jamunali (Kandata	24	128	65	63	18	8	10	0	0	0	73	40	33
9	Jaripani	37	139	65	74	25	12	13	0	0	0	50	24	26
10	Jhinkidadar	87	416	213	203	64	24	40	0	0	0	9	5	4
11	Kardapal	123	506	249	257	55	29	26	58	29	29	106	50	56
12	Kasibahal(Bad)	149	633	337	296	80	41	39	51	27	24	0	0	0
13	Kasibahal(san)	41	192	97	95	28	15	13	26	11	15	50	25	25
14	Khajurijharan	53	250	137	113	47	30	17	11	8	3	181	95	86
15	Khajurijharan(San	41	192	91	101	21	12	9	12	5	7	180	86	94
16	Khandahata	177	744	376	368	86	42	44	203	95	108	12	3	9
17	Kharsali	56	257	135	122	35	23	12	39	20	19	159	84	75
18	Kukudabahali	204	889	443	446	122	68	54	28	16	12	77	40	37
19	Kusumkhol	33	137	70	67	24	14	10	6	3	3	76	39	37
20	Kutasingha	91	381	188	193	43	26	17	40	18	22	23	9	14
21	Ladubahal	29	129	62	67	9	3	6	0	0	0	0	0	0
22	Luhapank	168	682	324	358	69	33	36	159	68	91	16	10	6
23	Mahalinga(san)	73	296	142	154	37	20	17	37	15	22	86	44	42
24	Maulabhanja	52	184	89	95	18	9	9	0	0	0	1	1	0
25	Nuapada(san)	109	473	226	247	43	25	18	41	21	20	0	0	0
26	Pitanali	47	195	107	88	30	20	10	3	2	1	2	1	1
27	Purunapani	392	1259	619	640	118	57	61	281	133	148	471	238	233
28	Sisuparna	72	316	152	164	38	22	16	37	19	18	33	17	16
			0			0			0			0		
	TOTAL	**2794**	**11312**	**5675**	**5637**	**1390**	**730**	**660**	**1291**	**615**	**676**	**2667**	**1352**	**1315**
	AVERAGE	**100**	**404**	**203**	**201**	**50**	**26**	**24**	**46**	**22**	**24**	**95**	**48**	**47**
			0			0			0			0		
DISTRICT	Sambalpur	179411	733006	368692	364314	84408	43170	41238	134729	67886	66843	318413	158927	159486

SL.NO.	Village	P_LIT	M_LIT	F_LIT	P_ILL	M_ILL	F_ILL	TOT_WORK_P	TOT_WORK_M	TOT_WORK_F	MAINWORK_P	MAINWORK_M	MAINWORK_F
1	Budhipani	49	34	15	53	19	34	43	27	16	8	7	1
2	Charbhati	567	332	235	374	160	214	572	310	262	259	181	78
3	Dangapal	695	385	310	250	97	153	384	252	132	64	53	11
4	Dhunkchhali	77	42	35	102	41	61	103	47	56	44	37	7
5	Haripur	130	83	47	122	47	75	140	74	66	93	47	46
6	Hatibahal	88	57	31	38	8	30	76	46	30	74	44	30
7	Hemamura	220	132	88	149	51	98	151	95	56	80	64	16
8	Jamunali (Kandata	76	45	31	52	20	32	38	22	16	19	12	7
9	Jaripani	40	25	15	99	40	59	82	39	43	10	6	4
10	Jhinkidadar	290	178	112	126	35	91	172	130	42	172	130	42
11	Kardapal	304	171	133	202	78	124	284	147	137	117	83	34
12	Kasibahal(Bad)	497	284	213	136	53	83	227	168	59	202	150	52
13	Kasibahal(san)	125	69	56	67	28	39	138	71	67	42	34	8
14	Khajurijharan	154	98	56	96	39	57	84	65	19	75	61	14
15	Khajurijharan(San	126	68	58	66	23	43	109	55	54	17	8	9
16	Khandahata	536	307	229	208	69	139	342	221	121	272	213	59
17	Kharsali	133	82	51	124	53	71	149	82	67	28	17	11
18	Kukudabahali	571	324	247	318	119	199	469	248	221	204	200	4
19	Kusumkhol	36	23	13	101	47	54	84	43	41	34	19	15
20	Kutasingha	255	135	120	126	53	73	176	117	59	114	72	42
21	Ladubahal	105	57	48	24	5	19	38	35	3	28	25	3
22	Luhapank	465	248	217	217	76	141	271	177	94	77	55	22
23	Mahalinga(san)	209	107	102	87	35	52	184	87	97	7	6	1
24	Maulabhanja	132	71	61	52	18	34	108	52	56	19	15	4
25	Nuapada(san)	325	169	156	148	57	91	261	119	142	110	92	18
26	Pitanali	68	43	25	127	64	63	114	60	54	58	42	16
27	Purunapani	842	469	373	417	150	267	721	377	344	577	357	220
28	Sisuparna	221	116	105	95	36	59	160	75	85	147	74	73
		0			0			0			0		
	TOTAL	**7336**	**4154**	**3182**	**3976**	**1521**	**2455**	**5680**	**3241**	**2439**	**2951**	**2104**	**847**
	AVERAGE	**262**	**148**	**114**	**142**	**54**	**88**	**203**	**116**	**87**	**105**	**75**	**30**
		0			0			0			0		
DISTRICT	Sambalpur	470897	266228	204669	262109	102464	159645	390542	224576	165966	238789	163449	75340

SL.NO.	Village	MAIN_CL_P	MAIN_CL_M	MAIN_CL_F	MAIN_AL_P	MAIN_AL_M	MAIN_AL_F	MAIN_HH_P	MAIN_HH_M	MAIN_HH_F	MAIN_OT_P	MAIN_OT_M	MAIN_OT_F
1	Budhipani	3	3	0	1	1	0	3	2	1	1	1	0
2	Charbhati	94	87	7	10	7	3	37	5	32	118	82	36
3	Dangapal	4	3	1	0	0	0	0	0	0	60	50	10
4	Dhunkchhali	9	9	0	2	2	0	1	0	1	32	26	6
5	Haripur	64	43	21	22	1	21	3	0	3	4	3	1
6	Hatibahal	33	31	2	21	0	21	4	0	4	16	13	3
7	Hemamura	37	36	1	9	7	2	13	2	11	21	19	2
8	Jamunali (Kandata	17	11	6	0	0	0	1	0	1	1	1	0
9	Jaripani	0	0	0	0	0	0	0	0	0	10	6	4
10	Jhinkidadar	109	107	2	12	12	0	0	0	0	51	11	40
11	Kardapal	46	44	2	42	23	19	13	2	11	16	14	2
12	Kasibahal(Bad)	128	127	1	0	0	0	59	11	48	15	12	3
13	Kasibahal(san)	30	30	0	12	4	8	0	0	0	0	0	0
14	Khajurijharan	48	46	2	11	9	2	0	0	0	16	6	10
15	Khajurijharan(San	0	0	0	11	7	4	2	0	2	4	1	3
16	Khandahata	104	104	0	100	78	22	35	8	27	33	23	10
17	Kharsali	0	0	0	1	1	0	5	1	4	22	15	7
18	Kukudabahali	93	93	0	64	64	0	3	3	0	44	40	4
19	Kusumkhol	3	2	1	0	0	0	9	0	9	22	17	5
20	Kutasingha	40	40	0	0	0	0	34	0	34	40	32	8
21	Ladubahal	18	18	0	0	0	0	3	0	3	7	7	0
22	Luhapank	30	30	0	1	0	1	0	0	0	46	25	21
23	Mahalinga(san)	0	0	0	0	0	0	0	0	0	7	6	1
24	Maulabhanja	6	5	1	5	4	1	0	0	0	8	6	2
25	Nuapada(san)	77	72	5	20	12	8	6	3	3	7	5	2
26	Pitanali	19	19	0	5	3	2	8	1	7	26	19	7
27	Purunapani	149	110	39	264	167	97	76	13	63	88	67	21
28	Sisuparna	17	15	2	32	19	13	33	0	33	65	40	25
		0			0			0			0		
	TOTAL	**1178**	**1085**	**93**	**645**	**421**	**224**	**348**	**51**	**297**	**780**	**547**	**233**
	AVERAGE	**42**	**39**	**3**	**23**	**15**	**8**	**12**	**2**	**11**	**28**	**20**	**8**
		0			0			0			0		
DISTRICT	Sambalpur	69793	58732	11061	70711	44562	26149	28484	6833	21651	69801	53322	16479

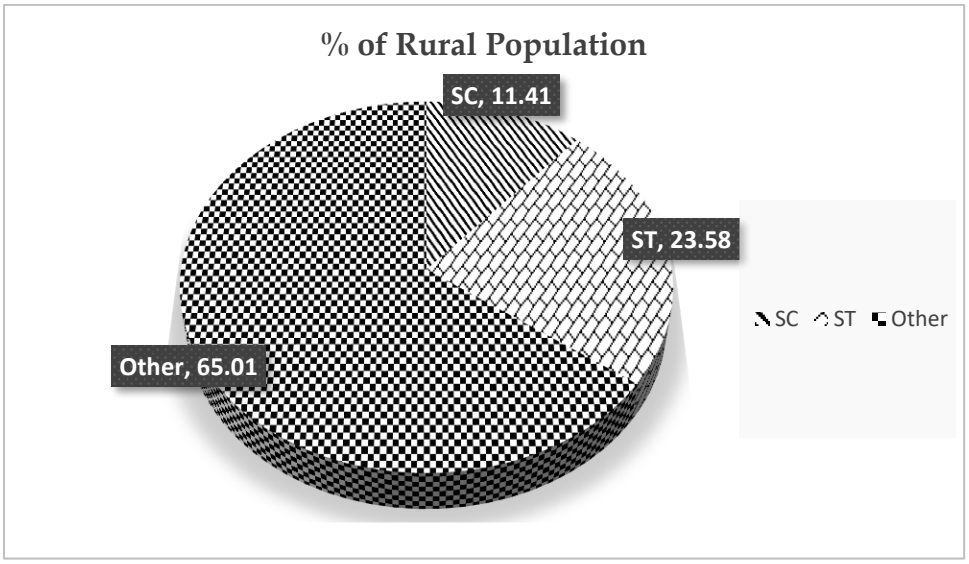
SL.NO.	Village	MARGWORK_P	MARGWORK_M	MARGWORK_F	MARG_CL_P	MARG_CL_M	MARG_CL_F	MARG_AL_P	MARG_AL_M	MARG_AL_F	MARG_HH_P	MARG_HH_M	MARG_HH_F
1	Budhipani	35	20	15	0	0	0	1	1	0	3	0	3
2	Charbhati	313	129	184	4	2	2	105	22	83	24	1	23
3	Dangapal	320	199	121	36	33	3	147	95	52	22	11	11
4	Dhunkchhali	59	10	49	4	2	2	2	1	1	29	1	28
5	Haripur	47	27	20	18	14	4	7	2	5	4	0	4
6	Hatibahal	2	2	0	0	0	0	1	1	0	0	0	0
7	Hemamura	71	31	40	0	0	0	9	2	7	7	1	6
8	Jamunali (Kandata	19	10	9	0	0	0	0	0	0	0	0	0
9	Jaripani	72	33	39	15	11	4	26	4	22	4	0	4
10	Jhinkidadar	0	0	0	0	0	0	0	0	0	0	0	0
11	Kardapal	167	64	103	22	9	13	83	23	60	5	2	3
12	Kasibahal(Bad)	25	18	7	0	0	0	0	0	0	0	0	0
13	Kasibahal(san)	96	37	59	1	1	0	50	18	32	40	17	23
14	Khajurijharan	9	4	5	0	0	0	9	4	5	0	0	0
15	Khajurijharan(San	92	47	45	0	0	0	1	0	1	40	5	35
16	Khandahata	70	8	62	1	1	0	3	0	3	6	0	6
17	Kharsali	121	65	56	6	5	1	42	14	28	27	12	15
18	Kukudabahali	265	48	217	10	9	1	136	29	107	110	6	104
19	Kusumkhol	50	24	26	2	2	0	11	3	8	9	0	9
20	Kutasingha	62	45	17	0	0	0	19	9	10	2	2	0
21	Ladubahal	10	10	0	0	0	0	0	0	0	0	0	0
22	Luhapank	194	122	72	17	10	7	122	92	30	0	0	0
23	Mahalinga(san)	177	81	96	6	2	4	105	51	54	48	14	34
24	Maulabhanja	89	37	52	2	0	2	68	32	36	12	1	11
25	Nuapada(san)	151	27	124	22	10	12	73	11	62	41	2	39
26	Pitanali	56	18	38	0	0	0	18	10	8	24	3	21
27	Purunapani	144	20	124	3	0	3	76	15	61	63	4	59
28	Sisuparna	13	1	12	0	0	0	9	1	8	1	0	1
		0			0			0			0		
	TOTAL	**2729**	**1137**	**1592**	**169**	**111**	**58**	**1123**	**440**	**683**	**521**	**82**	**439**
	AVERAGE	**97**	**41**	**57**	**6**	**4**	**2**	**40**	**16**	**24**	**19**	**3**	**16**
		0			0			0			0		
DISTRICT	Sambalpur	151753	61127	90626	13686	7405	6281	86004	33803	52201	22936	2948	19988

SL.NO.	Village	MARG_OT_P	MARG_OT_M	MARG_OT_F	NON_WORK_P	NON_WORK_M	NON_WORK_F
1	Budhipani	31	19	12	59	26	33
2	Charbhati	180	104	76	369	182	187
3	Dangapal	115	60	55	561	230	331
4	Dhunkchhali	24	6	18	76	36	40
5	Haripur	18	11	7	112	56	56
6	Hatibahal	1	1	0	50	19	31
7	Hemamura	55	28	27	218	88	130
8	Jamunali (Kandata	19	10	9	90	43	47
9	Jaripani	27	18	9	57	26	31
10	Jhinkidadar	0	0	0	244	83	161
11	Kardapal	57	30	27	222	102	120
12	Kasibahal(Bad)	25	18	7	406	169	237
13	Kasibahal(san)	5	1	4	54	26	28
14	Khajurijharan	0	0	0	166	72	94
15	Khajurijharan(San	51	42	9	83	36	47
16	Khandahata	60	7	53	402	155	247
17	Kharsali	46	34	12	108	53	55
18	Kukudabahali	9	4	5	420	195	225
19	Kusumkhol	28	19	9	53	27	26
20	Kutasingha	41	34	7	205	71	134
21	Ladubahal	10	10	0	91	27	64
22	Luhapank	55	20	35	411	147	264
23	Mahalinga(san)	18	14	4	112	55	57
24	Maulabhanja	7	4	3	76	37	39
25	Nuapada(san)	15	4	11	212	107	105
26	Pitanali	14	5	9	81	47	34
27	Purunapani	2	1	1	538	242	296
28	Sisuparna	3	0	3	156	77	79
		0			0		
	TOTAL	**916**	**504**	**412**	**5632**	**2434**	**3198**
	AVERAGE	**33**	**18**	**15**	**201**	**87**	**114**
		0			0		
DISTRICT	Sambalpur	29127	16971	12156	342464	144116	198348

i) Population:

The total population of 26 villages is 11312.

The % of Schedule Caste (SC) and Schedule Tribe (ST) to the total population is 11.41 & 23.58 respectively.



ii) Village size:

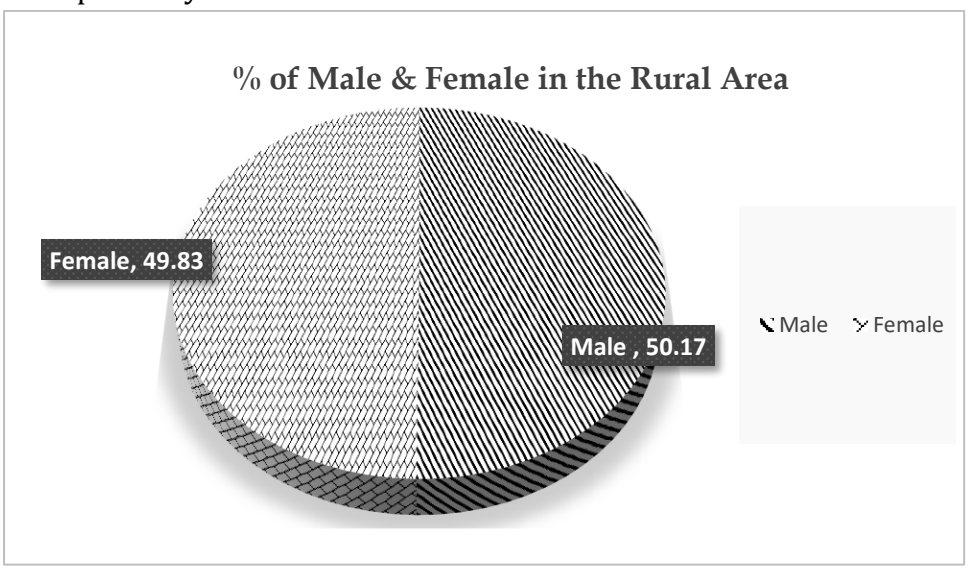
The total households in the 26 villages are 2794. The average household per village is 100.

iii) House hold size:

The average household size is 4.05 in rural area.

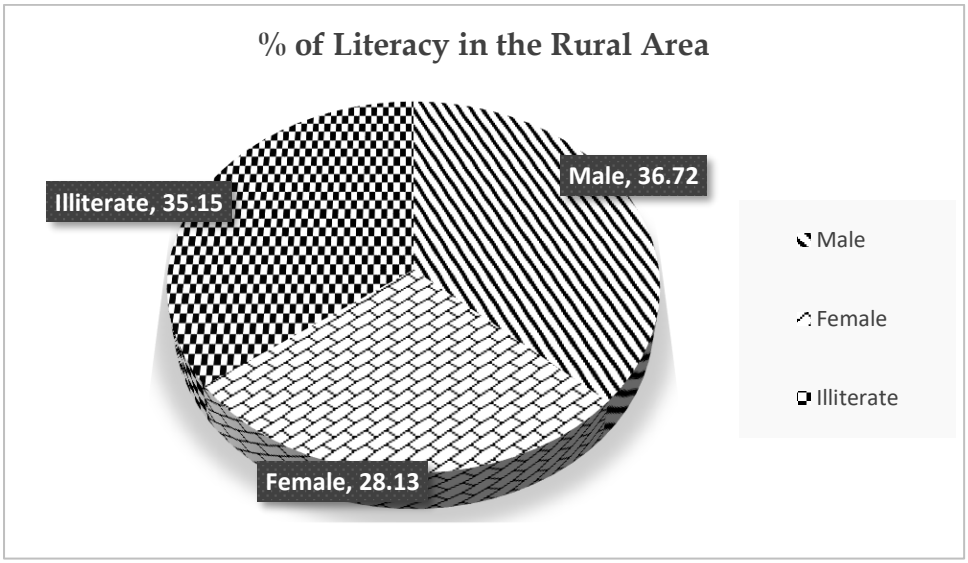
iv) Sex Ratio:

The sex ratio of the study area is 993 females per thousand male population in rural area. The percentage of male and female population to the total population is 50.17 and 49.83 respectively.



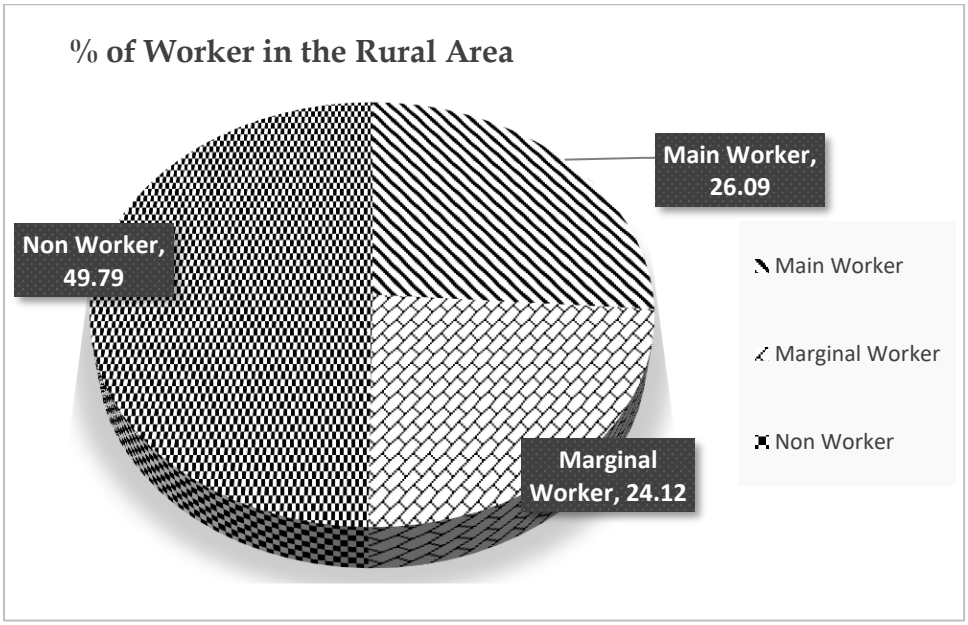
v) Literacy: The percentage of literacy in the area is 64.85.

The % male and female literacy to the total population is 36.72 & 28.13 respectively.



vi) Occupational structure of the study area:

The percentage of total workers to the total population of the rural area is 50.21 in which main workers constitute 26.09% and marginal workers constitute 24.12 % and remaining 49.79 % constitute non-workers.



Demographic features and other Statistics for the Study Area (Rural Area) as per Census 2011

S. No.	Details	No./%
1	Total population	11312
2	No. of House hold	2794
3	Average family size	4.05
4	Average no. of house hold per village	100

5	Average population per village	404
6	Sex ratio –females per thousand males	993
7	Percent of male population to total population	50.17
8	Percent of female population to total population	49.83
9	Percent of SC population to the total population	11.41
10	Percent of ST population to the total population	23.58
11	Percent of literate population to the total population	64.85
12	Percent of Male literate population to the total population	36.72
13	Percent of Female literate population to the total population	28.13
14	Percent of total main worker to the total population	26.09
15	Percent of total marginal worker to the total population	24.12
16	Percent of non-worker to the total population	49.79

From the table it is clear that Sex Ratio is 993 and has still scope for improvement.
ST/SC population is approx. 35 %.
Gender gap between male and female literacy is approx. 9%.
Employment is a major concern besides literacy.

Primary Survey

The nearby villages were selected for field survey (Budhipani, Charbhati, Haripur, Hemamura, Jaripani, Jhinkidadar, Kardapal, Khajurijharan, Kharsali, Kusumkhol, Luhapank, Mahalinga, Maulabhanja, Punapani, Sisuparna etc.)

Further the data for villages surveyed and data available for the same villages of Census 2011 was compared and data found to be validated.

Basic Observations

1. There is termite problem in almost all the villages.
2. The villages in the core zone and buffer zone are having primary amenities and infrastructural facilities but have scope for improvement.
3. Hindu is the major religion.
4. Sex Ratio has still scope of improvement in rural area.
5. Gender gap between male and female literacy is approx. 9 % in rural area.
6. Employment is a major concern besides literacy.
7. ST/SC population is approx. 35 %.
8. People are dependent on agriculture and secondly on forests.
9. Primary survey was conducted in nearby villages & data collected based on specific designed Questionnaire & focused group discussions. There has been increase in the population & other related factors since 2011 (male population, female population, SC/ST population, literacy, working population, category of workers etc.). While comparing the house hold survey results with census data 2011 the observations are found to be validated.

10. The inferences cannot be generalized due to limitation of survey and also cost consideration. As such the inferences cannot be used for any other purpose and is not liable for any legal action.

DEMOGRAPHY AS PER CENSUS 2011

Dhenkanal Population 2011 - 2001

Description	**2011**	**2001**
Population	10.41 Lakhs	9.36 Lakhs
Actual Population	1,041,099	935,613
Male	526,877	475,122
Female	514,222	460,491
Population Growth	11.27%	15.01%
Area Sq. Km	6,624	6,624
Density/km2	157	141
Proportion to Orissa Population	2.48%	2.54%
Sex Ratio (Per 1000)	976	969
Child Sex Ratio (0-6 Age)	940	959
Average Literacy	76.22	67.29
Male Literacy	84.35	79.01
Female Literacy	67.93	55.21
Total Child Population (0-6 Age)	117,848	125,433
Child Proportion (0-6 Age)	11.32%	13.41%

Dhenkanal Child Population

There were total 117,848 children under age of 0-6 against 125,433 of 2001 census. Of total 117,848 male and female were 60,744 and 57,104 respectively. Child Sex Ratio as per census 2011 was 940 compared to 959 of census 2001. In 2011, Children under 0-6 formed 11.32 percent of **Dhenkanal** District compared to 13.41 percent of 2001. There was net change of -2.09 percent in this compared to previous census of India.

Dhenkanal Houseless Data

In 2011, total 379 families lived on footpath or without any roof cover in Dhenkanal district of Odisha. Total Population of all who lived without roof at the time of Census 2011 numbers to 1,174. This is approx. 0.11% of total population of Dhenkanal district.

Dhenkanal District Density

Density of Dhenkanal district for 2011 is 157 people per sq. km. In 2001, Dhenkanal district density was at 141 people per sq. km. Dhenkanal district administers 6,624 square kilometres of areas.

Dhenkanal District Urban/Rural 2011

Description	Rural	Urban
Population (%)	70.41 %	29.59 %
Total Population	733,006	308,093
Male Population	368,692	158,185
Female Population	364,314	149,908
Sex Ratio	988	948
Child Sex Ratio (0-6)	955	903
Child Population (0-6)	84,408	33,440
Male Child(0-6)	43,170	17,574
Female Child(0-6)	41,238	15,866
Child Percentage (0-6)	11.52 %	10.85 %
Male Child Percentage	11.71 %	11.11 %
Female Child Percentage	11.32 %	10.58 %
Literates	470,897	232,794
Male Literates	266,228	126,964
Female Literates	204,669	105,830
Average Literacy	72.60 %	84.76 %
Male Literacy	81.78 %	90.29 %
Female Literacy	63.35 %	78.95 %

Dhenkanal District Religion Data

Description	Percentage	Population 2011
Hindu	92.61 %	964,188

Description	Percentage	Population 2011
Muslims	1.93 %	20,120
Christian	4.86 %	50,637
Sikh	0.24 %	2,506
Buddhist	0.03 %	310
Jain	0.01 %	86
Others	0.11 %	1,117
Not Stated	0.21 %	2,135

PROBABLE IMPACT OF BIO MEDICAL WASTE ON SOCIETY

WHO defines medical waste as waste generated by health care activities, ranging from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices and radioactive materials. Waste management is an essential part of health care. Medical waste is a source of generation of hazardous biomedical waste. Medical waste generation and disposal is an important aspect, especially in countries with poor hygiene and high population. Medical centre's including hospitals, clinics, and places where diagnosis and treatment are conducted generate wastes that are highly hazardous and put people under risk of fatal diseases.

Impacts

- Improper handling, treatment, and disposal of biomedical wastes lead to pollution of air, water and land . Indoors and outdoors environments can easily be affected by air pollution. The three types of air pollutions generated by biomedical waste are biological, chemical and radioactive.
- Out of the total biomedical wastes produced each day, approximately 15–20% is hazardously injuring humans, animals, and the environment.
- Mixing the non-hazardous waste with hazardous waste makes the whole of the waste very infective.
- Healthcare waste management, including that of biomedical waste, is as important as disposal of that waste. The impact of biomedical waste on the environment should be the concern of every one in every healthcare facility, regardless of size or location. That's why it's important to identify it and segregate it properly.

- Improper segregation of biomedical waste and different medical waste streams from the point of origin can trigger a domino-like effect on the environment that incurs dangers to people, animals or soil and water sources.
- Lack of awareness about the health hazards related to health-care waste, inadequate training in proper waste management, absence of waste management and disposal systems, insufficient financial and human resources, and the low priority given to the topic are the most common problems connected with health-care waste.
- Treatment and disposal of health-care waste may pose health risks indirectly through the release of pathogens and toxic pollutants into the environment.
- Landfills can contaminate drinking water if they are not properly constructed. Occupational risks exist at disposal facilities that are not well-designed, run, or maintained.
- Incineration of waste has been widely practised, but inadequate incineration or the incineration of unsuitable materials results in the release of pollutants into the air and of ash residue. Incinerated materials containing chlorine can generate dioxins and furans, which are human carcinogens and have been associated with a range of adverse health effects. Incineration of heavy metals or materials with high-metal content (in particular lead, mercury, and cadmium) can lead to the spread of toxic metals in the environment.
- Only modern incinerators operating at 850–1100°C and fitted with special gas-cleaning equipment are able to comply with the international emission standards for dioxins and furans.
- Alternatives to incineration are now available, such as autoclaving, microwaving, steam treatment integrated with internal mixing, and chemical treatment.

3.1.6 CSR/CER action plan proposed

1. More emphasis on Education specially job-oriented skill development of the youth.
2. Employment generation activities by forming SELF HELP GROUPS. SHG's for agriculture may be considered.
3. Contribution towards Maintenance of Roads /Schools/ Temples/Primary hospitals including value addition in terms of public facilities may be from PP.

4. Policies are framed to avoid spread of infections by providing specification for handling waste for generation, segregation, collection, storage, transportation, and treatment.
5. Awareness should be created at all levels of society through various means of communication and education, so that the risks of spreading the health hazards could be minimized.

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CHAPTER-4 : ANTICIPATED ENVIRONMENTAL IMPACT AND ITS MITIGATION MEASURES

4.1 INTRODUCTION

The impact assessment is carried out for the following phases.

- Impacts during construction/development phase
- Impacts during operation phase

4.2 General Impacts

The environmental baseline scenario has been detailed in Chapter 3 and proposed setup of CBWTF has been detailed in Chapter 2, it is attempted to assess the likely impact and its extent on various environmental parameters in this Chapter. The parameters, which are relevant within the context, are as detailed below.

The likely effects are discussed in this Chapter on various environmental descriptors, namely:

- Landuse/ Landcover (LU/LC)
- Ambient Air Quality (AQ)
- Noise levels and vibration (NV)
- Water resources
- Ground Water (GW)
- Surface Water (SW)
- Soil (S)
- Ecology & Biodiversity (EB)
- Socio Economic (SE)
- Occupational health, community health and safety (OH/CH &S)

Impact Assessment Methodology

To carry out the impact assessment of the proposed common biomedical waste treatment facility, the methodology adopted for impact assessment is such that the whole project is divided into major activities and for each activity adverse or positive impact is identified and divided into the following sections here under: -

- Identification of CBWTF activities.
- Impact prediction, evaluation due to these activities and its mitigation measures.
- Impact analysis i.e. consequence/ Score analysis.

4.3 Identification of Common Biomedical Waste Treatment Facility (CBWTF) Activities

Applicable components of the environment on which the environmental aspects can cause an impact were identified. Environmental impacts have been identified based on an assessment of environmental aspects associated with the proposed set up of common biomedical waste treatment facility. The symbol '—' indicates an adverse impact,'+' indicates an beneficial impacts and '+/—' indicates both positive and negative and 'N' indicates not applicable.

Table 4-1: Impact Identification Matrix

S.NO.	PROJECT ACTIVITIES	POTENTIAL IMPACT AREAS									Remarks
		Landuse/ Landcover	Air Quality (AQ)	Noise and Vibration (NV)	Surface Water (SW)	Ground Water (GW)	Soil (S)	Ecology & Biodiversity (EB)	Socio- Economic (SE)	Occupational risk&Hazard, RH	
1	**Site Selection**										
1.1	Land lease (Already allotted for Common Bio medical Waste Treatment Storage & Disposal Facility).	-	N	N	N	N	N	N	+	N	LU: Potential change in landuse/landcover SE: Employment opportunities forvillagers in surrounding area.
2	**Preparation of Site**										
2.1	Clearance of vegetation at site and preparation ofapproach roads	-	-	-	N	N	-	-	+	-	LC: Removal of vegetation, AQ/NV: Air emissions, noise and vibration from movement of vehicles, Construction equipment and road laying equipment, S: Soil erosion, EB: loss of green cover,
											SE: improvement of roads,/ amenities. RH: risk of accidents /occupational injuries

2.2	Excavation and paving of site	-	-	-	N	N	-	N	+	-	LC: Change In land cover, AQ/NV: air emissions and noise due to excavation operations, S: removal of topsoil, SE: temporary job creation for excavation and site preparation work, RH: occupational risk due to excavation work
3	**For setting up of proposed Common Biomedical Waste Treatment Facility (CBMWTF) i.e., autoclave, incinerator, shredder, storages sheds, ETP, etc.**										
3.1	Civil works such as earth moving and building of structures including temporary structures	N	N	N	-	N	-	-	+/ -	N	SW: alteration of surface run off and interflow, S: Removal of top soil, EB: terrestrial ecology because of noise and vibrations, SE: creation of new economic activities/ decrease of commercial values of property due to NIMBY syndrome.
3.2	Heavy equipment operations	N	-	-	N	N	-	-	+	+/-	AQ/NV: air emission and noise dueto construction machinery, S: Contamination in case of any spillage of oil, EB: Disturbance to terrestrial ecology because of noise and vibrations,

											SE: temporary employment generation & increment in values of commercial goods, RH: hazard due to accident
3.3	Workforce accommodation & sanitation	N	N	N	N	-	-	N	+	N	S: soil contamination if soak pit or ETP is not designed properly, GW: on water quality, SE: marginal increase in indirect income of locals due to onsite crew
3.4	Fuel storage	N	N	N	-	-	-	N	N	-	SW, GW, S: possibility of surface water and ground water & Soil contamination, due to spillage if any, RH: occupational risk due to handling of material
3.5	Use of raw water for project development facility (construction) & operational facility	N	N	N	N	N	N	N	N	N	Water shall be sourced from Ground water
3.6	Operation of DG set	N	-	-	N	N	-	N	N	N	AQ/NV: air and noise emission due to operation of DG set, S: possibility of soil contamination due to spillage of diesel or oil
3.7	Circulating and Cementing	N	N	N	N	-	-	N	+	N	GW/S: possibility of ground water and soil contamination leakage during circulating and cementing, SE: temporary

											employment Generation.
4	**Operational and maintenance of CBMWTF**										
4.1	Transportation of wastes to facility from health care facilities	N	-	-	N	N	N	N	+/ -	+/-	AQ: due to traffic movement emissions, NQ: minor vibrations and noise, RH: Road and fire accidents, handling of infectious waste, aesthetic and human interest, SE: disturbance in existing traffic pattern, creation of new jobs.
4.2	Storage and treatment of Bio-medical waste	N	-	N	N	N	-	N	N	-	AQ: air borne infection due toimproper storage/handling/treatment, Soil: possibility of soil contamination due to improper disposal of Bio- medical waste, OH/OH&S: Risk to workers during handling and to community health due to spillage in surrounding area if not stored properly.

4.3	Waste material handling and in boundary transport	N	-	N	N	N	N	N	N	-	AQ: due to internal transportation of waste to respective facility, OHS: temporary, acute, chronic health effects to the workers involved (if not trained properly) and defective PPE.
4.4	Storage, handling and disposal of waste water	N	N	N	N	-	-	N	N	-	GW/S: possibility of ground water and soil contamination due to improper disposal of wastewater, OH/OH&S: risk to worker/ community health due to spillage in surrounding area if not stored/treated properly
4.5	Emissions from processing units (stack attached to incinerator	N	-	-	N	N	-	-	-	-	AQ/NV: air and noise emission if not controlled, Soil: Soil contamination due to emission, EB: impact on ecology and biodiversity of surrounding area due to uncontrolled emission, effect on crops, SE:, RH/S: risk of fatal injury to worker and staff working at site, risk to community/ health due to un-controlled emission in surrounding area .

4.4 Impacts Prediction/Evaluation and its Mitigation Measures

For prediction of impacts on environment due to the proposed project activities there are several scientific techniques and methodologies which are adopted. Mathematical models are useful tools (where applicable) to quantitatively describe the cause and effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a situation, predictions have been arrived at based on logical reasoning / consultation / extrapolation or overlay methods. In any case, for each component of the environment, the methods used to arrive at the likely impacts are required to be described.

Evaluation is an absolute term used for assessment and prediction by means of numerical expression or value. Assessment is the process of identifying and interpreting the environmental consequences of the significant actions. Prediction is a way of mapping the environmental consequences of the significant actions. Significant action depicts direct adverse changes caused by the action and its effect on health of biota including flora, fauna and man, socio-economic conditions, landforms and resources, physical and cultural heritage properties and quality of bio-physical surroundings. In most cases the predictions consist of indicating merely whether there will be degradation, no change, or enhancement of environmental quality. An impact indicator is a parameter that provides a measure (in at least some qualitative or numerical sense) of the significance and magnitude of the impact. In the existing scenario, indicators are available in the form of primary and biological water quality criteria, and national ambient standards for noise and air notified by the MoEF&CC or published by the Central Pollution Control Board.

Predictions of biological environmental components are often uncertain, because their response to environmental stress cannot be predicted in absolute terms. The impacts of the proposed project on the environment have been considered based on the information provided by the proponents and data collected at the site. Primary impacts are those, which are attributed directly by the project while secondary impacts are those, which are indirectly induced and typically include the associated investments and changed pattern of social and economic activities by the proposed action.

The construction and operation phase of the proposed project comprises various activities each of which have been considered for assessing the impact on one or another environmental parameter.

Construction phase comprises of site cleaning, machinery installation etc whereas establishment phases mainly consist of civil works such as earth moving, leveling of land and approach roads. Machinery installation and commissioning involve activities like fabrication work, cutting, welding and other facilities, lying of cables and pipelines etc. It involves testing of plant for any type of leakages and designed capacity.

4.5 Impacts during Construction phase:

For the proposed project, the construction activity is temporary and the impact during the construction phase will be short term. This includes the impact on the following

environmental attributes related to leveling of site, construction of plants and other related structures and equipment.

4.5.1 Air environment

Impact on air environment during construction phase would be due to various activities as transportation of materials, equipment & machineries, leveling, excavation, construction and dismantling. The potential source of air quality impact arising from the establishment/construction of the project is fugitive dust generation. The dust, measurable as particulate matter (PM10 & PM2.5), sulphur dioxide (SO2), oxides of nitrogen (NOx), would be generated as a result of construction activities. The potential dust sources associated with the constructional activities are loading and unloading of the materials, top soil removal, vehicular movement over unpaved roads, and soil erosion etc. The possible constructional activities that contribute to the environmental impacts are broadly given below:

- Dust generation during leveling of earth.
- Dust generation due to the movement of vehicles on unpaved roads.
- Emission of pollutants from vehicular exhaust, engine powered generators.
- Unloading of raw materials and removal of unwanted waste material.
- Accumulation of excavated earth material.

4.5.2 Water environment

Impact on water quality during construction phase may be due to sewage generated from the construction work force stationed at the site. Further, the construction in the project will be using ready mix concrete more related to mechanical fabrication and assembly hence the water requirements would be medium used majorly for concrete curing purposes and water sprinkling. Temporary sanitation facilities will be set up for disposal of sanitary sewage generated by the work force as per the prevailing labor laws. Since, most of the construction work force will constitute a floating population, the demand for water and sanitation facilities will be small and temporary and it will be managed by providing drinking water facility and sanitation facilities at the site during construction phase. The overall impact on water environment during construction phase is likely to be short term and insignificant.

4.5.3 Noise environment

The major sources of noise during the construction phase are vehicular traffic, construction equipment like dozers, scrapers, concrete mixers, cranes, pumps, compressors, pneumatic tools, saws, vibrators etc. The operation of these equipment will generate noise ranging between 85-90 dB (A) near the source at 1-m distance. These noises will be generated within the plant boundary and will be transient in nature. This would be short term and limited to project site.

4.5.4 Ecology

Dust emissions from the construction activity will affect the plant and animal respiration activity. Construction activities change the natural environment. Emissions such as PM, NOx, SOx from D.G sets and other equipment / vehicles may also cause respiration problem for the surrounding organisms. The anticipated impact on biological environment (both terrestrial and aquatic) is of low magnitude, short term and overall impact on biological environment is insignificant.

4.5.5 Socio economic development

The proposed facility is likely to provide direct and indirect employment and likely to increase the socio-economic status of the nearby villages in the study area. Due to proposed project the facilities for water supply, communications, education facility, public health and economic conditions are likely to improve.

4.5.6 Public safety and aesthetics

The public may get affected due to improper management of the treatment facility. The project site is away from the settlements. Hence, the adverse impact on public health due to contamination and noise will be less.

The facility will not discharge any waste water and ash out of its premises which may cause aesthetic nuisance. There will be no deforestation due to the facility. Hence, there will be no impact on aesthetics due to the proposed project. However, proper housekeeping will be practiced so that the aesthetics is not spoilt even during construction phase.

4.5.7 Mitigation Measures during Construction phase

4.5.7.1 Air Quality

For the proposed project site leveling and grading will be carried out, where every possible measure to maintain the natural elevations will be observed and nothing will be disturbed, only leveling activity will be carried out for providing roads, sewage network, storm water system, and places required for providing buildings for administrative, plant shed erection. According to the engineering assessment; most of the excavated material will be within the project boundary. The movement of cut and fill material is limited. Most of the construction dust generated from the movement of construction vehicles on unpaved roads. Unloading and removal of soil material will also be an act for potential source for dust nuisance. The control measures will be taken up are given below.

- The dust suppression measures will be regular with water sprinkling on main haul roads in the project area, this activity will carried out twice a day,

- The duration of stockpiling will be short as most of the material will be used as backfill material for the open cut trenches and road development.
- Temporary tin sheets of sufficient height (3m) will be erected around the site of dust generation or all around the project site as barrier for dust control.
- Tree plantations around the project boundary will be initiated at the early stages by Plantation of 2 to 3 years old saplings, regular watering will be done.

4.5.7.2 Water Quality

- The earthwork (cutting and filling) will be avoided during rainy season and will be completed during summer season. Stone pitching on the slopes and construction of concrete drains for storm water to minimize soil erosion in the area will be undertaken. Furthermore, development of green belt in and around plant will be taken up during the monsoon season and in-plant roads will be paved.
- No stagnant water will be allowed at the site.
- Temporary sanitation facilities will be provided.
- In order to avoid any solid waste disposal problems effective solid waste management systems for collection of waste in dust bins will be carried out.

4.5.7.3 Noise Level

- The impact on noise environment can be made insignificant by adopting the following mitigation measures;
- All noise generating equipment used during daytime for brief period of its requirement.
- Proper enclosures will be used for reduction in noise levels, wherever possible the noise generating equipment will be kept away from the human habitation.
- Providing workers noise proof chambers and ear plugs
- All the vehicles entering into the proposed site will be informed to maintain speed
- limits, and not to blow horns unless it is required

4.5.7.4 Solid Waste

The solid waste generated during the period will predominantly inert in nature. Hence maximum effort will be made to reuse and recycle them. The most of the solid waste material will be used for filling/ levelling of low-laying areas within the site. All attempts will be made to stick to the following measures.

- All construction waste will be stored within the site itself. Proper screen will be

provided, so that the waste does not get scattered.

- Attempts will made to keep the waste segregated into different heaps as far as possible so that their further gradation and reuse will facilitated.
- Materials, which will be reused for construction purpose like, levelling, making roads/ pavement will be kept in separate heaps from those which will be sold for construction purposes.
- The use of the construction material basically depends on their separation and conditions of the separated material. A majority of these materials are durable and therefore, have a high potential for reuse.

Wastes generated during construction will be used in the following manner.

- Reuse of bricks, tiles, stone slabs, timber, piping railings etc to the extent possible and depending upon their conditions.
- Sale of materials which cannot be used at the site due to design constraint.
- Plastics, broken glass, scrap metal etc. is stored and processed within the site premises.
- Rubble and brick bats will be used for building activity, such as levelling the low-lying areas within the plot and used as aggregate for constriction of rainwater harvesting structure.
- The unearthed soil will be used for levelling as well as for lawn development

4.5.7.5 Green belt

A three-tier green belt will be developed with native species to abate dust, noise and odour and to increase the aesthetic value. The green belt will cover 33% of the total project area i.e. 3539.25 sqm (0.87 acre).

Total Trees required as per CPCB/MoEF&CC Norms @ 2,500/ha = 0.35 x 2,500 = 875 No's

About 875 numbers of trees will be planted under green belt to abate dust, noise, odour and soil erosion.

Table 4-2: Proposed Plantation List

S. No.	Common Name	Scientific Name	Family
1.	Dhaura	*Anogeissus latifolia*	Combretacae
2.	Neem	*Azadirachta indica*	Meliaceae
3.	Indian rosewood	*Dalbergia sissoo*	Fabaceae
4.	Jarul	*Lagerstroemia speciosa*	Lythraceae
5.	Tree of Gold	*Tabebuia argentea*	Bignoniaceae
6.	Common Crape Myrtle	*Lagerstroemia Flos reginae*	Lythraceae

7.	Bod	*Salix tetrasperma*	Salicaceae
8.	Rahan	*Soymida tebrifuya*	Meliaceae
9.	Saja	*Terminalia alata*	Combretacae
10.	Arjun	*Terminalia arjuna*	Combretacae
11.	Harra	*Terminalia Chebulo*	Cambretaceae
Total			

4.6 Impacts and Mitigation measures to be adopted during Operational Phase

Details of measures to be taken for control of air pollution including measures to control emission of Dioxin and Furan.

4.6.1 Air Pollution

- The flue gases shall be run through a Venturi and flooded scrubber and then vented through a 30 m high stack. The temperatures of the incinerator shall be continuously monitored through a strip chart recorder/data logger for effective recording of temperatures.
- For **Dioxin and Furan** the following measures shall be adopted.
  - Proper segregation of waste. Chlorinated Plastics in garbage affect the amount of dioxin formation.
  - Minimization of Chlorine input can reduce the formation of dioxin and furan
  - Avoid combustion of wet garbage, as the wet garbage produce more dioxin.
  - Good combustion chamber design to optimize the supply of air for achieving complete destruction of waste.
  - The flue gas resulting from the combustion process is raised to a temperature to 800°C ± 50 °C for at least 2 seconds in municipal waste incinerator or to a temperature of 1050°C ± 50 °C for at least 2 seconds for hazardous waste incinerators for destruction of dioxin in the flue gas.
  - Quick cooling of flue gas to minimize dioxin reformation between 200°C to 400°C.
- De-mister shall be provided to eliminate mist.

4.6.1.1 Prediction of Impacts on the Air Environment

Prediction of impacts from the proposed project on the ambient air quality is carried out using air quality simulation models. The main sources of air pollution is from

- Point source emissions from DG set and incinerator.

The emissions and noise from the DG sets are minimal since they will be operated only during power failures and also with proper precautions like recommended covers to prevent fugitive emissions.

Atmospheric Dispersion of Stack Emissions

In order to estimate the ground level concentrations due to the emissions from the proposed project, EPA approved American Meteorological Society/ Environmental Protection Agency Regulatory Model -AERMOD dispersion Model has been used. AERMOD dispersion Model provides option to model emissions from a wide range of sources that are present at a typical industrial source complex. The model considers the sources and receptors in undulated terrain as well as plain terrain and the combination of both. The basis of the model is the straight line steady state Gaussian Plume Equation, with modifications to model simple point source emissions from stacks, emissions from stack that experience the effect of aerodynamic down wash due to nearby buildings, isolated vents, multiple vents, storage piles etc.

AERMOD dispersion model with the following options has been used to predict the cumulative ground level concentrations due to the proposed emissions.

Area being rural, rural dispersion parameters is considered as

- Predictions have been carried out to estimate concentration values over radial distance of 10 km around the sources
- A combination of Cartesian and Polar receptor network has been considered
- Emission rates from the sources were considered as constant during the entire period
- The ground level concentrations computed were as is basis without any consideration of decay coefficient
- Calm winds recorded during the study period were also taken into consideration 24- hour mean meteorological data extracted from the meteorological data collected during the study period as per guidelines of IMD/CPCB has been used to compute the mean ground level concentrations to study the impact on study area.

Pollution Sources

Point Sources

The point source emissions considered for the proposed project are from DG set and incinators. The DG set will be used only during power failure for emergency requirements. Hence the impacts from the DG set will be felt only during power failure. Besides this solar power facility will be explored for the offices, storage places, autoclaves and shredder. The inputs used to run the model are stack details, emissions details are given in Table 4.1 The Predicted maximum Ground level concentration of PM, SO_2 and NOx concentrations considering 24 hour mean meteorological data of study season are superimposed on the

maximum baseline concentrations obtained during the study period to estimate the post project scenario, which would prevail at the post operational phase. The overall scenario with predicted concentrations over the maximum baseline concentrations is shown in the following Table 4.3 and Isopleth are shown in the Figure 4.1 to Figure 4.4.

Mathematical Model for Pollutants Dispersion Model Set-up

The model simulations are done for the air pollutant arising from the mining operations, namely PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO. Ground Level Concentration (GLC) have been computed using hourly meteorological data. The model set-up details are presented in below:

Parameter Details

- Model Name: AERMOD
- Model Type: Steady state Gaussian Plume Air Dispersion model
- Averaging Time 24 hours
- Source Type: Point Source
- Boundary Limits: 10 km x 10 km
- Co-ordinate System: Uniform Cartesian Grid
- Anemometer: 10 m

Table 4-3: Air Emissions Details

Details	DG	Incinerator
Plant Capacity	40 KW	400 kg/hr
Type of fuel	Diesel	Diesel
Fuel (lit/hr)	16	27
Height of the stack (m)	12	30
Temp of flue gas (degree Celsius)	500	140
Internal Dia. of the stack (m)	0.07	0.5
Velocity of flue gas (m/s)	25	10
PM10 Emissions (g/s)	0.0026	0.08
PM2.5 Emissions (g/s)	0.0017	0.06
SO2 Emissions (g/s)	0.115	0.06
NO_X Emissions (g/s)	0.088	0.1
CO Emissions (g/s)	0.077	0.08

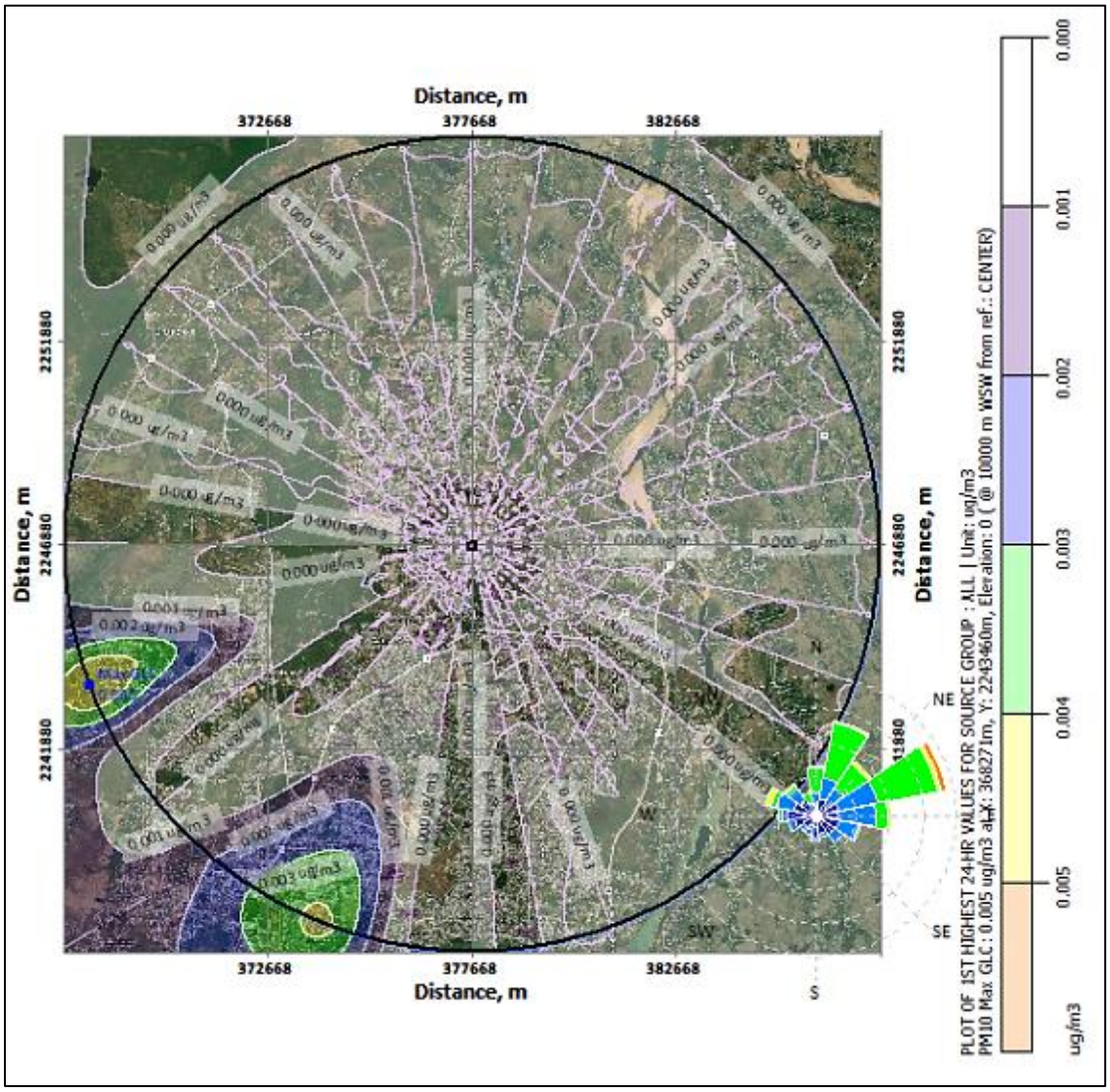

Figure 4-1: GLC for PM_{10}

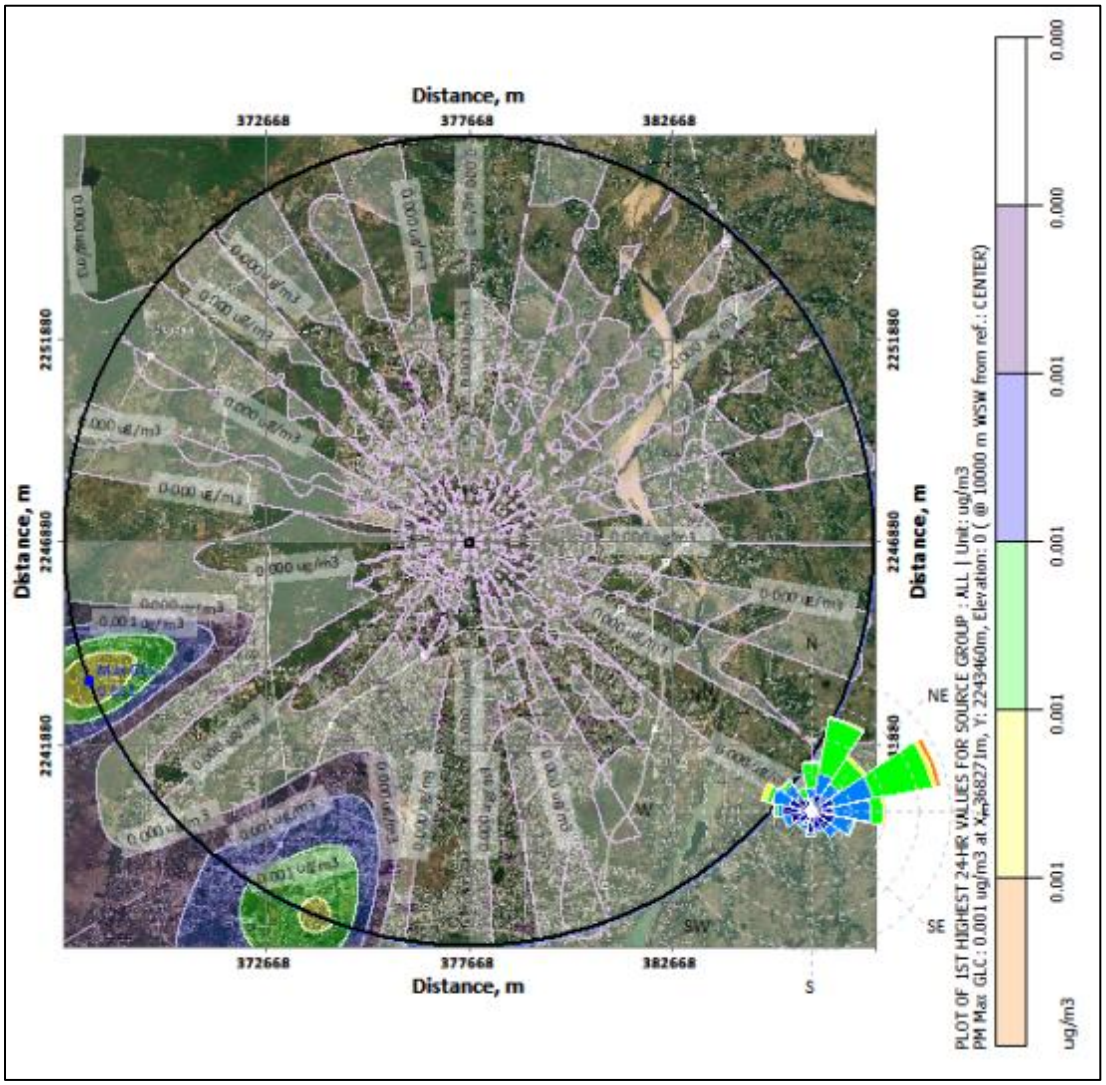

Figure 4-2: GLC for $PM_{2.5}$

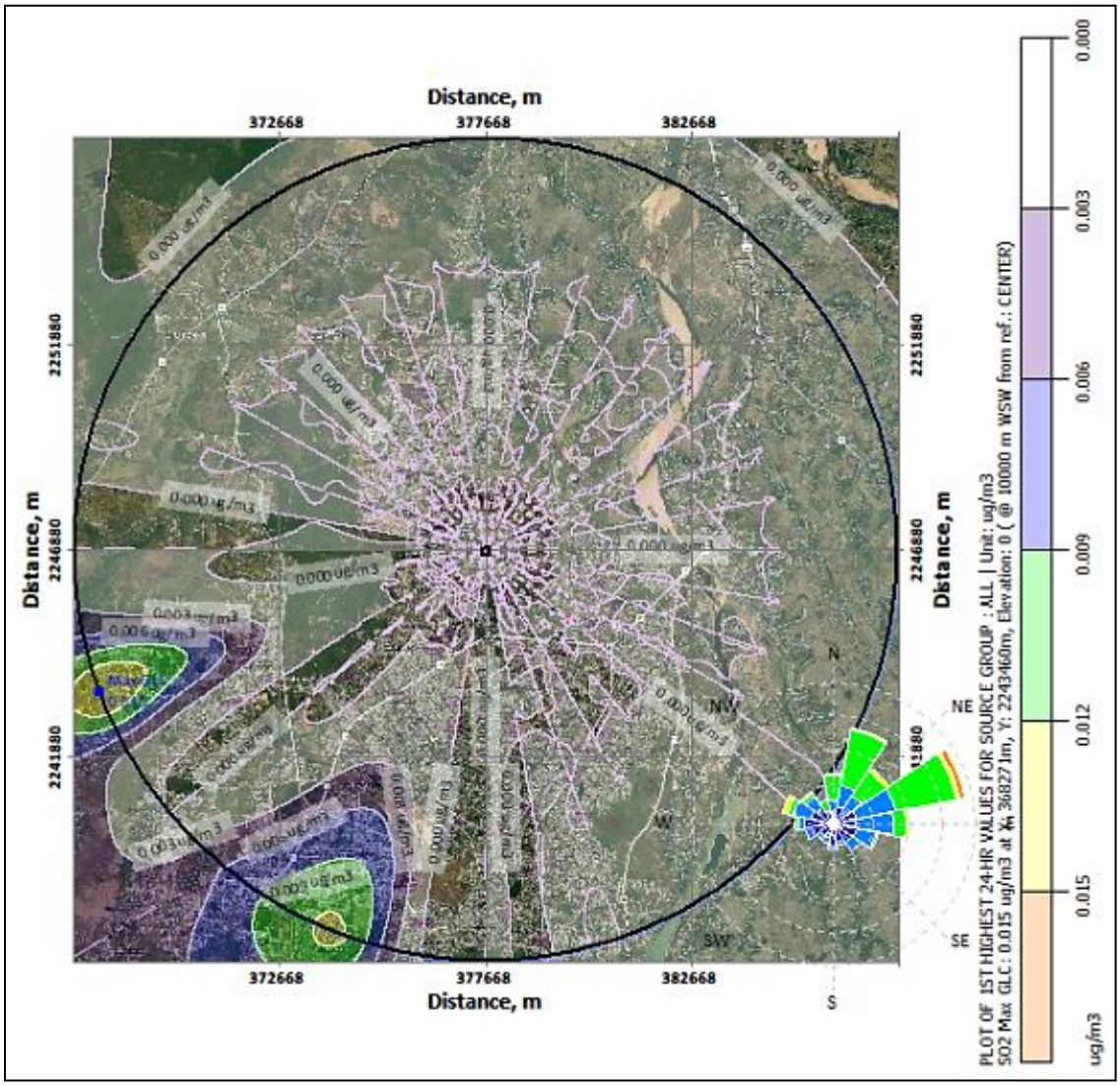

Figure 4-3: GLC for SO_2

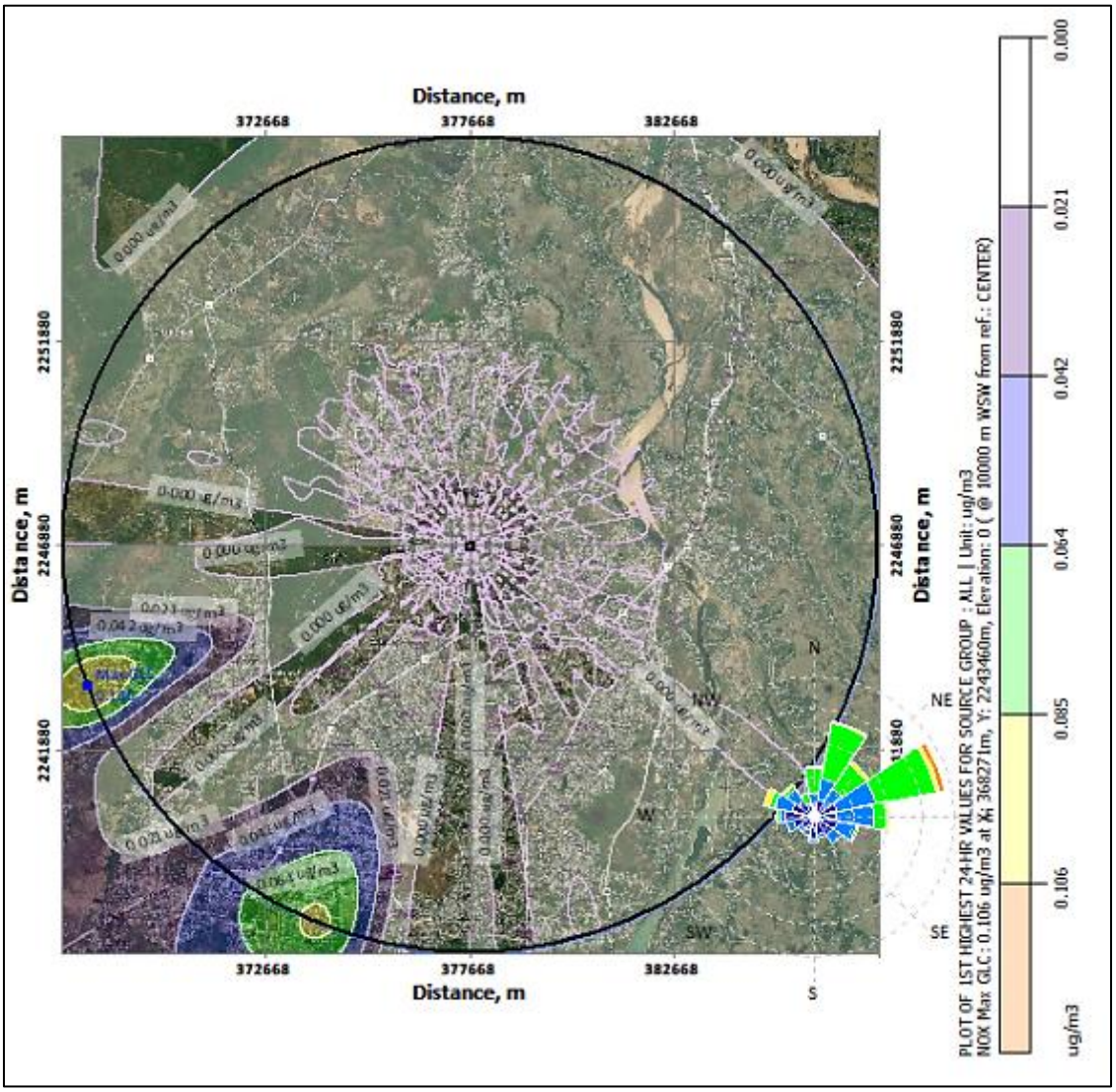

Figure 4-4: GLC for NO_2

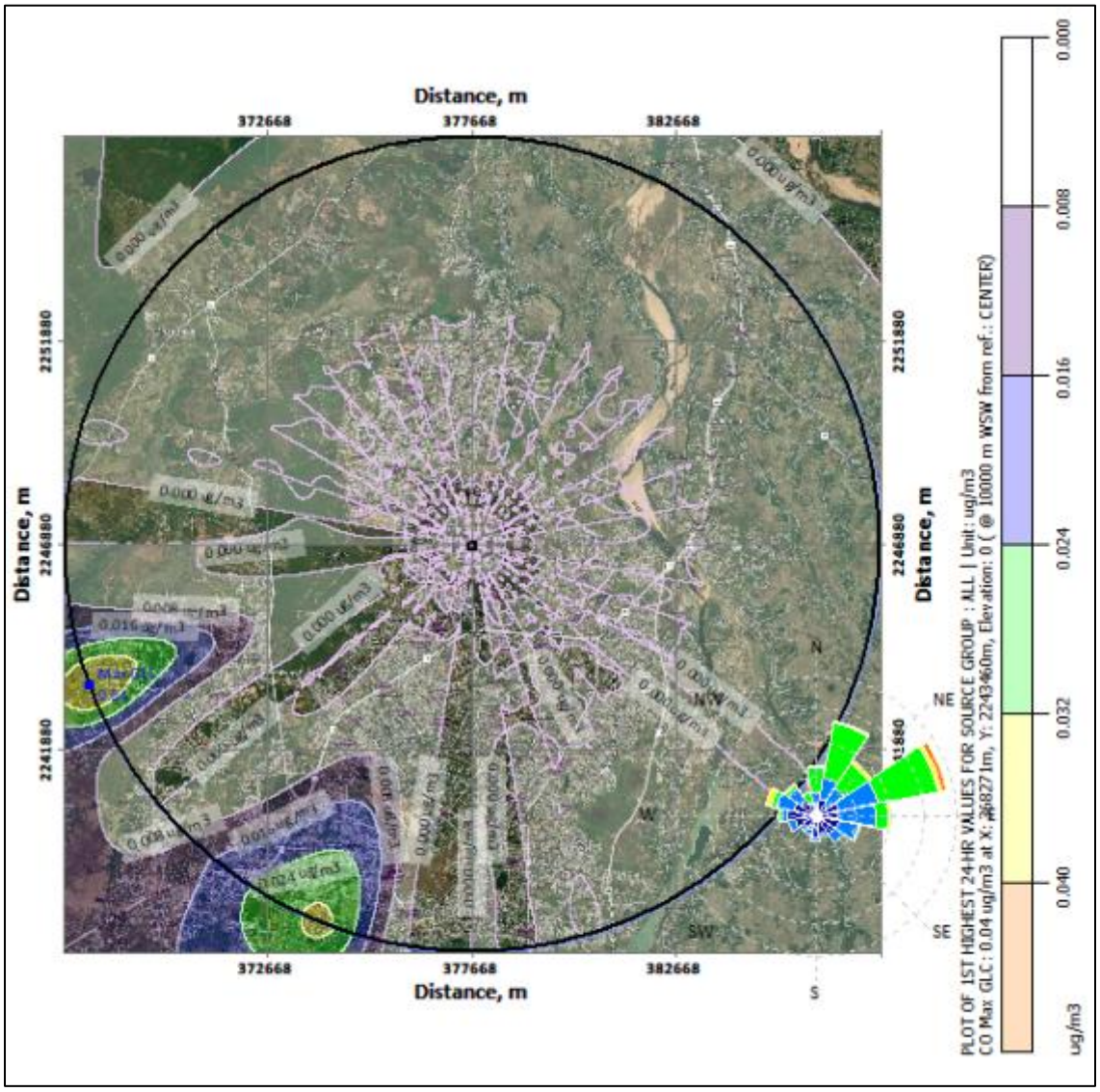

Figure 4-5: GLC for CO

Table 4-4: Impact on Air Quality due to the Proposed Project (24 h avg in µg/m³)

Parameter	Background level, Maximum in study area (µg/m³)	Predicted MGLC (µg/m³)	Superimposed Concentration (µg/m³)	NAAQS (µg/m³)
SO_2	6.0	0.015	6.015	80
NO_X	13.9	0.106	14.006	80
PM_{10}	66.2	0.005	66.205	100
$PM_{2.5}$	34.3	0.001	34.301	60
CO	300	0.04	300.04	4000

4.6.1.2 Details of pollution control technologies and online monitoring equipment's

Monitoring provision for continuous emission of the Incinerator stack emission shall be installed. The incinerator will be equipped with air pollution control system i.e. quencher, Venturi scrubber and wet alkali scrubber followed by ID fan with 30 m stack.

4.6.2 Water Pollution

- The main source of wastewater in the proposed project is water of quencher - wet scrubber, cleaning of the floors and pavements of the facility and vehicles, vehicle wash area, etc will be treated in ETP.
- The entire wastewater collected at the sump shall be treated in In-house Effluent Treatment Plant (ETP) and the treated water shall be reused primarily in APCDs connected to the incinerator and will be continuously re-circulated to meet the requirement. No treated wastewater shall be discharged out of the premises of the CBWTF. Unit will be operated as ZLD.
- The domestic wastewater will be disposed in STP.

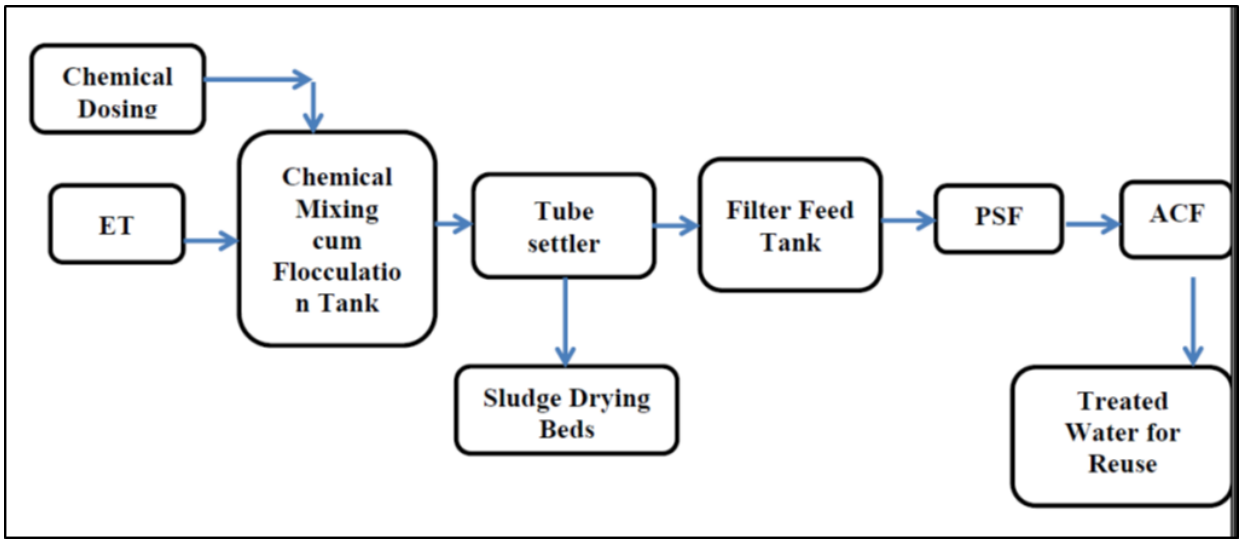

Figure 4-6: Flow diagram of ETP

- Rainwater will be collected in rainwater harvesting pond. Roof water will be collected by adopting proper. The surface runoff rainwater will be channelized check dams all along the storm water drainage network at a definite pitch.

4.6.3 Noise pollution

The noise pollution mitigation measures are presented below.

- High noise generating equipment's like pumps, motors, diesel generators etc. should be on anti- vibration pads, closed rooms and regular maintenance as suggested by the manufacturer.

- Noise level specification of the various Equipment's as per the Occupational Safety and Health Association (OSHA) standards.
- Providing suitable enclosures (adequate insulation) to minimize the impact of high noise generating sources.
- Employees will be provided with PPE like ear plugs, ear -muff.
- Development of greenbelt all along the boundary and roads within the premises

4.6.4 Ecology and Land Environment

Green belt will be developed along the boundary which will measure 33% of the total site area. Due to the development of green belt at the project vicinity the impact on the ecology will be minimal.

4.6.5 Landfill

Ash and ETP sludge generated during the operation phase would be sent to the Hazardous waste secure landfill site.

4.6.6 Socio Economic development

The project is having immense social benefits as it is processing the waste generated in the health care units. Earlier these wastes were left without treatment damaging to the environment and causing various health hazards to the people. This facility is essential as it minimizes the risk of health hazards for the people.

As a result of the project, employment opportunities will be generated. PP will invest in development of the area through CER activities.

4.6.7 Public safety and aesthetics

The proponent will take care of proper management of all the activities. With the implementation of a strong environmental management plan, the communities residing near the project site are unlikely to be exposed to any long -term hazards.

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CHAPTER-5 : ANALYSIS OF ALTERNATIVE (TECHNOLOGY & SITE)

The Biomedical Waste Management Rules, 2016 and the CPCB guidelines for setting up of Common Biomedical Waste Treatment Facility have been fully referred to finalize the specifications for installation of treatment units and its operation as statutory requirement for CBWF and no alternate technology was explored. No Alternative sites were considered as the selected site is meeting the guidelines of CBWTF issued by CPCB and are owned by the proponent.

5.1 Criteria for Site Selection

The proposed project site meets the site selection criteria of CPCB guidelines. The following areas must be excluded or rejected (knock out Criteria) for this type of industries.

1) Areas with unstable geological features like unstable or weak soils; organic soil, soft clay or clay-sand mixtures, soils that lose strength with compaction or with wetting, clays with a shrink-swell character, sand subjected to subsidence and hydraulic influence.
2) Subsidence: e.g. owing to subsurface mines, water, oil or gas withdrawal or solution prone subsurface.
3) Wet lands.
4) Historical migration zones.
5) Flood prone areas
6) Area with 500 m from water supply zone and within 200 m from property line
7) Natural depression and valleys where water contamination is likely
8) Areas of ground water recharge and extremely high-water table zone
9) Unique habitation areas, close to national parks with scenic beauty and formerly used landfills
10) Areas with high population, unique archaeological, historical, paleontogical and religious interests,
11) Agricultural and forests lands and existing dump sites,
12) Atmospheric conditions that would prevent safe disposal of an accidental release.
13) Major natural hazards, e.g. volcanic activity, seismic disturbance, etc.
14) Sensitive locations, e.g. storing flammable or explosive materials, airports
15) An unfavorable local hydro-geological situation, e.g. springs or drinking water well within very close proximity to the chosen area
16) Extremely bad access i.e. no existing access roads to the selected site which may

involve Long distance more than 5 km from main roads.

17) Great difference in altitude between the area of waste collection and the selected

Table 5-1: Location criteria of the Project

Parameter	Criteria	Observation
Lake or Pond (Distance from SW body)	Should not be within 200 m	No water body located within 200 m Site.
River	Should not be within 100m	No river within 100m of the site
Flood Plain	Should not be within 100- year flood plain	Not in the flood plain.
Highway – State or National	Should not be within 500m	NH-53 ~6.3 km
Habitation Notified Habited area	Should not be within 500m	No habitation within 500m from the proposed site area. The nearest habitation from the proposed site is 0.9 km to the NNE.
Public Parks	Should not be within 500m	No public parks within 500m
Reserved forest area	Not suitable	Proposed land does not belong to Rain Forest
Wet lands	Not suitable	No wet land nearby.
Airport	Should not be within zone around the airport(s)	No airport is near by the site.
Water Supply	No water supply within 500m	No water supply wells exist within 500m
Ground water table level	GW table should be >2m from the base of the landfill	No land fill proposed.
Presence of monuments/ religious structures.	Not Suitable	No monuments/ religious structures exist.

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CHAPTER-6 : ENVIRONMENTAL MONITORING PROGRAM

6.0 TECHNICAL ASPECTS OF MONITORING THE EFFECTIVENESS OF MITIGATION MEASURES (INCLUDING MEASUREMENT METHODOLOGIES, FREQUENCY, LOCATION, DATA ANALYSIS, REPORTING SCHEDULES, EMERGENCY PROCEDURES, DETAILED BUDGET & PROCUREMENT SCHEDULES).

Environmental monitoring program describes the processes and activities that will monitor the quality of the environment. Environmental monitoring is used in the preparation of environmental impact assessments, as well as in many circumstances in which human activities carry a risk of harmful effects on the natural environment. All monitoring strategies and program have reasons and justifications which are often designed to establish the current status of an environment or to establish trends in environmental parameters. In all cases the results of monitoring will be reviewed, analyzed statistically and submitted to concerned authorities. The monitoring program will have three phases

- Construction phase
- Operation phase
- Post Operation phase

6.1 Construction Phase

The major construction activities involved in setting up the unit will be construction of sheds for treatment units, stores, administrative blocks etc. The major components in the industry are incinerator, auto clave, shredder, diesel generator, ETP, APCD, Vehicles for BMW collection & transportation and other civil, mechanical and electrical equipment. During construction phase of the CBWT facility, at every stage quality of construction will be monitored viz. base preparation and installation of equipment's.

The environmental mitigation measures will be undertaken during project construction stage are given in the following **Table 6.1.**

Table 6-1: Environmental Measures taken during Construction Phase

Potential Impact	Detailed actions will be followed	Parameters for Monitoring	Frequency of Monitoring
	All equipment will be operated within specified design parameters	Random checks equipn logs/manuals	Periodically once in a month
	Vehicle trips will be minimized to the possible extent	Vehicle logs	Regular Basis
	Any dry, dusty materials will be stored in sealed containers or prevented from blowing.	Stockpiles or containers o materials. pen	-

Air Emissions	Compaction of soil during various construction activities will be done	Construction logs	Once during Construction Phase
	Maintenance of construction DG set emissions to meet stipulated standards	Gaseous emissions (SO_2, HC, CO, NOx)	Periodically once in a month or As per CTE conditions.
	Ambient air quality within the premises & adjacent villages of the proposed unit will be	PM_{10}, $PM_{2.5}$, SO_2, NOx and CO	As per CTE conditions.
Noise	List of all noise generating machinery onsite along with age will be prepared.	Equipment logs, noise reading	Regular basis
	No Night working of generating machines	Working hour records	Regular basis
	Generation of vehicular activities noise	Maintenance of records of vehicles	
	Implement good working practices (equipment selection and sitting) to minimize noise and also reduce its Impacts on human health.	Site working practices records, noise reading	
	No machinery running when not required.		
	Acoustic mufflers /enclosures will be provided	Mufflers/enclosures shall be in place.	Prior to use of equipment
	Noise level will be monitored in ambient air within the plant premises.	Instant Noise recording	As per CPCB/SPCB requirements
	The Noise level will be exceeding the permissible limit both during day and night times.		
	All equipment's operated within specified design parameters.	Random checks of equipment logs/manuals	
	Vehicle trips to be registered	Vehicle logs	Regular Basis
	minimized to the extent possible		
Waste water Discharge	No discharge of wastewater will be into surface water, groundwater or soil.	No discharge hoses into watercourses.	-

Soil Erosion	Minimize area extent of site clearance, by staying within the defined boundaries	Site boundaries not extended/breached as per plan document.	-
	Protect topsoil stockpile effective cover in place	Periodic during construction activities	-
Drainage and effluent Management	Ensure drainage system and specific design measures will be working effectively.	Visual inspection of drainage and records thereof	Regular Basis
Risk assessment	Plan will be drawn considering likely emergency and steps required to prevent limit	Mock drills and records of the same	Once in construction phase.
Health	Employees and migrant labor health check ups	All relevant parameters including HIV	Annual as well before taking any person on rolls

6.2 Operation Phase

During operational stage, air emissions from incinerator, DG set, wastewater characteristics, ash generation quantity, etc. are monitored. The following attributes which merit regular monitoring based on the environmental setting and nature of project activities are listed below:

- Point Source emissions and ambient air quality in nearby villages;
- Groundwater Levels and ground water quality;
- Water & wastewater quality & quantity;
- Solid waste characterization (Ash, Effluent treatment plant –Sludge)
- Soil quality
- Noise levels (equipment and machinery noise levels, occupational exposures and ambient noise levels)
- Ecological preservation and afforestation

The environmental monitoring schedule is presented in **table 6.2**.

Table 6-2: Environmental Measures to be taken during Construction Phase

Potential Impact	Action to be Followed	Parameters for	Frequency of Monitoring
Air Emissions	Stack emissions from Incinerator	Temperature, Pressure, CO, Excess Oxygen, Particulates, HCl, NO_X, HF, TOC, Mercury,	Once in Six Month or Twice in a year or as per CTO conditions.

	AAQ within the study area (8 places) to be monitored	PM, NOx, CO, HCl	Once in Six Month or Twice in a year or as per CTO conditions.
	All vehicles have to get PUC		
Noise	Noise generated from operation of DG sets, cooling towers, etc. to be monitored	Spot Noise Level recording	Once in Six Month or Twice in a year or as per CTO conditions.
Water	Wastewater Discharge	Compliance to wastewater discharge standards pH, TSS, TDS, BOD, COD & Oil & grease (Heavy metals if required)	Daily at regular intervals Once in a month by third party
Solid Waste	Solid waste/Hazardous Waste	Check compliance to HWM rules	Quality & quantity monitoring Periodically/CPCB
Ground Water Quality	Monitoring ground water quality, around plant site and piezometers	Comprehensive monitoring as per IS10500 Groundwater Level BGL	Once in Six Month or Twice in a year or as per CTO conditions. & as per CPCB norms
Flora and fauna	Vegetation, greenbelt / green cover	No. of plants, species	Once in a year
Soil quality	Checking & Maintenance of good soil quality around	Physico-chemical parameters and metals.	Once in a year
Health	Employees health check ups	All relevant parameters (BP, Sugar, chest X- ray Eye vision, etc.)	Once in a year

Waste to be incinerated shall not be chemically treated with any chlorinated disinfectants. Steps shall be taken to prevent formation of dioxins by rapidly lowering the flue gas temperatures, particularly from 500° C to less than 200° C by adopting rapid quenching. As per Bio-Medical Waste Management Rules 2016, monitoring of dioxins and furans shall be done once in a year through a professional third party (in the presence of PCB officials, if required). The use of a scrubber can reduce the dioxin and furan emissions by a total of 86%.

6.3 Environmental Management Cell Details

An environmental management cell will be formed headed by CBWTF head. The environmental cell will provide necessary services and co-ordinate on environmental issues of the project. This environmental group will be responsible for implementation of environmental management plan, interaction with the environmental regulatory agencies, reviewing draft policy and planning. This department will interact with State Pollution Control Board (SPCB), other environment regulatory agencies and all member. The department will also interact with local people to understand their problems and to formulate appropriate community development plans.

The organizational setup of the environmental management cell is given below in Figure 6.1.

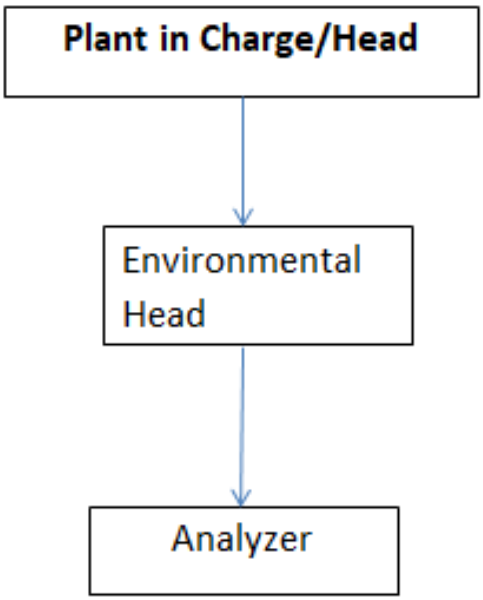

Figure 6-1: Proposed Environmental Monitoring Cell Structure

6.4 Pollution Monitoring Facilities

Incinerator stack, DG set stack will have provision of platform and port hole to collect the samples as per MOEFCC standards.

6.5.1 Reporting Schedules of the Monitoring Data

It is proposed that voluntary reporting of environmental performance with reference to the EMP should be undertaken. The environmental monitoring cell shall co- ordinate all monitoring program at site and data thus generated shall be regularly furnished to the State regulatory agencies. The frequency of reporting shall be on quarterly basis or as per CTO conditions to the local state PCB officials and Six monthly EC compliance to Regional office of PCB. The Environmental Audit reports shall be prepared for the entire year of operations and shall be regularly submitted to regulatory authorities.

6.5.2 Budgetary Provision for EMP

In order to comply with the environmental protection measures as suggested in the above sections, the project management has made budgetary provision for environmental protection and safety measures.

6.5.3 Public Health Monitoring

The value of Public Health studies in seeking to establish whether or not a site or facility has caused significant adverse health effects is well known. In this situation the results from a public health study may not fulfill the primary objective of such a program, which is to detect health changes before the manifestation of adverse health effects. However, three-stage health-monitoring program is proposed.

- Monitor the health of workers within the project site to identify adverse health effects, and will also be immunized with vaccination for tetanus, tuberculosis and Hepatitis B.
- Periodically obtain feedback from local doctors regarding any potential indicators of adverse health effects due to environmental cause in the communities surrounding, and particularly down-stream of the landfill.
- By organizing health camps in surrounding areas on a regular basis.

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CHAPTER-7 : ADDITIONAL STUDIES

7.1 PUBLIC CONSULTATION/HEARING

Public hearing is an integral part of project requiring prior EC. Public hearing is the process by which the concerns of local affected persons and others who have reasonable stake in the environmental impacts of the project or activity are ascertained. The project falls under schedule 7 (d a), Category 'B1', activities shall undertake Public hearing as per the provisions of EIA notification 14th Sep., 2006 and its amendments.

The Public hearing will be held based on the draft EIA/EMP Report prepared in compliance to Terms of References issued by SEIAA, Odisha. This draft EIA/EMP Report will be submitted to Odisha State Pollution Control Board. Representative of various Villages, Officers of M/s MKD Eco Clean Private Limited various Department, affected people's representatives will be invited to participate in the public hearing. All other persons having an interest in the project will be asked to submit their findings in writing before the public hearing. The demand/suggestion/opinion will be included in the report along with minutes of Public Hearing during Finalization of EIA-EMP Report.

7.2 RISK ASSESSMENT

7.2.1 Risk Assessment & Disaster Management Plan

Risk analysis is the systematic study of uncertainties and risks encountered in various areas during any operation. Industrial process & activities inherently pose hazards. There may be possible hazards to human beings, flora-fauna, all forms of property and the environment as a whole. Extreme care is essential in handling all of them in various stages of treatment of biomedical waste etc. The management aims at full preparedness to meet effectively the eventualities resulting from any unfortunate occurrence of hazards/accidents. Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the project site. On the other hand, risk analysis deals with the identification and quantification of risks occurring due to the plant equipment and personnel exposed, due to accident resulting from the hazards in the plant. The main objective of the risk assessment study is to determine damage due to major hazards having damage potential to life and property and provide a scientific basis to assess safety level of the facility. The secondary objective is to identify major risk in treatment process, operation, occupation and provide control through assessment and also to prepare on-site, off site plans to control hazards. In this chapter, an attempt has been made towards hazard identification and risk assessment with regards to the incident leading towards losses and to prioritize the action for either eliminating the hazard or minimizing the effect of it along with the disaster management plan.

Hazard Identification and Risk Assessment is conducted for Construction and Operational Phase:

7.2.2 Construction Phase

Construction phase of the proposed project is divided into following activities:

a. Excavation;

b. Construction of building;

c. Construction of high-rise structure (i.e. stack);

d. Material handling (loading and unloading);

e. Cutting and welding; and

f. Installation of machineries.

Detailed description is as below:

Table: 7-1: List of Hazards and Mitigation

Activity	Hazards	Risk	Mitigation Measures
Excavation	• Excavation collapses • Powered mobile equipment • Slips, trips, and falls • Hazardous atmospheres • Flooding / water hazards	• Property loss • Physical injury • Life loss	• Work Permit System will be followed. • Only experienced person will asset to team. • Excavated material will be stacked safely. • Area will be barricaded. • Training will be provided to all workers • PPEs will be provided. • Unauthorized person' entry will be banned.
Construction of building	• Heavy material may fall down during loading and unloading. • Structure may fall down if poor practice done. • Falling objects. • Metal/Glass Scrabs in open may cause injury in feet.	• Physical injury • Life loss • Physically handicapped • Property loss	• Work permit system will be adopted. • PPEs will be provided to all workers. • IS code will be followed for Building and Construction. • Fire extinguisher will be provided • Height work permit will be issued to the person working at height above 3m.

	• Workers may fall down from the height.		• Safety belt will be provided to workers working on height above 3m. • Adequate training will be provided for specific job works.
Commissioning of high-rise structure (i.e. 30-m height Stack);	• Material may fall down	• Physical injury • Life loss	• High rise structure will be constructed as per detailed engineering drawing. • Safety belt will be provided to workers working on height more than 3m. • Height work permit will be implemented. • Proper training will be provided for scaffolding. • PPEs will be provided.
Material handling (loading and unloading)	• Extra weight lifting can cause strain in body muscles.	• Physical injury	• Material will lift as per safety norms. • PPEs will be provided.
Cutting and Welding	• Welding, cutting and allied processes produce molten metal, sparks, slag, and hot work surfaces, can cause fire or explosion if precautionary measures are not followed. • Electric shock from electrical welding and cutting equipment can result	• Physical injury • Burn injury • Property loss • Life loss	• Work permit will followed. • Proper SOP will be developed. • Training will be provided. • Job will be assigned to only authorized person • Proper PPEs will be provided. • Loose connection will be avoided. • Area will be barricaded.

	in death or severe burns.		
Installation of Machineries.	• Due to over load lifting belt break out • Unauthorized operator of Lifting of Crane can create an emergency	• Property loss • Physical injury • Life loss	• Only authorized person will operate the machine • Appropriate belt will be used for lifting of material • During lifting and placing of material area will be man free. • Appropriate platform will be designed as per the load bearing calculation.

7.3 Additional Risk Control Measures:

Detailed Construction Hazard Identification Risk Assessment study will be done and accordingly safety manual will be prepared.

- First aid facility will be provided.
- 24 hrs Ambulance facilities will be provided.
- Authorized contractor will be selected.
- Safety officer will be appointed.
- Training to the workers will be provided.
- Safety slogan and instruction will be marked/painted at appropriate location.
- All safety instructions will be provided to all the contractors.

7.3.1 Operation Phase

Activities requiring assessment of risk due to occurrence of most probable instances of hazardand accident are both onsite and off-site.

A) On-Site

a. Exposure to fugitive dust, noise, and other emissions.

b. Emission/spillage etc. from storage and handling.

c. Unsafe condition and unsafe act.

d. Approach of heavy good vehicles for unloading material

e. Excessive dust during loading/unloading operation

f. Unauthorized passages, travelling over transportation system

g. Electrocution/ Electrical Hazards

h. Mechanical Hazards

Common Cause of Accidents

Based on the study, common causes of accidents observed are identified as:

- Poor housekeeping;
- Improper use of tools, equipment, facilities;
- Unsafe or defective equipment facilities;
- Lack of proper procedures;
- Failure to follow prescribed procedures;
- Jobs not understood;
- Lack of awareness of involved hazards;
- Lack of guides and safety devices;
- Lack of protective equipment and clothing

B) Off-site

a. Contamination due to accidental releases or normal release in combination with natural hazard
b. Deposition of toxic pollutants in vegetation / other sinks and possible sudden releases due to accidental occurrences

Hazard Identification and Risk Assessment (HIRA)

There are three steps used to manage health and safety at work:

- Spot the Hazard (Hazard Identification)
- Assess the Risk (Risk Assessment)
- Make the Changes (Risk Control)

Spot the Hazard

A hazard is anything that has potential to cause harm. Examples of workplace hazards include:

- Frayed electrical cords (could result in electrical shock);
- Noisy machinery (could result in damage to your hearing).

Assess the Risk

Assessing the risk means working out how likely it is that a hazard will harm someone and how serious the harm could be. For example:

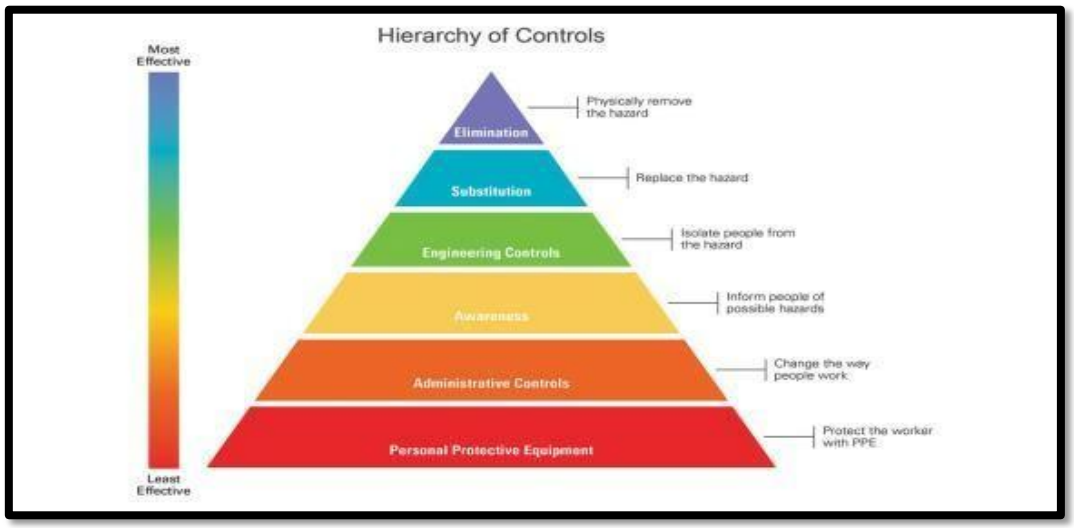
- Ask your supervisor for instructions and training before using equipment;
- Ask for help moving or lifting heavy objects;
- Tell your supervisor if you think a work practice could be dangerous.

Make the Changes

The best way to fix a hazard is to get rid of it altogether. This is not always possible, but your employer should try to make hazards less dangerous by looking at the following options (in order from most effective to least effective):

- **Elimination -** Sometimes hazards - equipment, substances or work practices - can be avoided entirely. (e.g. Clean high windows from the ground with an extendable pole cleaner, rather than by climbing a ladder and risking a fall.)
- **Substitution -** Sometimes a less hazardous thing, substance or work practice can be used.
- **Isolation -** Separate the hazard from people, by marking the hazardous area, fitting screens or putting up safety barriers. (e.g. Welding screens can be used to isolate welding operations from other workers. Barriers and/or boundary lines can be used to separate areas where forklifts operate near pedestrians in the workplace.)
- **Safeguards -** Safeguards can be added by modifying tools or equipment, or fitting guards to machinery. These must never be removed or disabled by workers using the equipment.
- **Instructing workers in the safest way to do something -** This means developing and enforcing safe work procedures. Students on work experience must be given information and instruction and must follow agreed procedures to ensure their safety.
- **Using personal protective equipment and clothing (PPE) -** If risks remain after the options have been tried, it may be necessary to use equipment such as safety glasses, gloves, helmets and ear muffs. PPE can protect from hazards associated with jobs such as handling chemicals or working in a noisy environment.

NIOSH defines five rungs of the Hierarchy of Controls: elimination, substitution, engineering controls, administrative controls and personal protective equipment.



Sometimes, it will require more than one of the risk control measures above to effectively reduce exposure to hazards.

Table 7-2 Risk Classification Table: Based on Likelihood/controls rating x severity rating

Almost certain	**5**	5	10	15	20	25
Likely	**4**	4	8	12	16	20
Possible	**3**	3	6	9	12	15
Unlikely	**2**	2	4	6	8	10
Rare	**1**	1	2	3	4	5
Likelihood / Control Rating		**1**	**2**	**3**	**4**	**5**
		Severity Rating				

The definition of risk level and acceptance criteria is given below:

Table 7-3 Acceptance Criteria of Risk Levels

	Risk level	**Category**	**Acceptability on necessary action and timescale**
Low Risk	1 – 3	Low	No additional controls are required unless they can be implemented at very low cost (in terms of time, money and efforts), actions to further reduce these risks are assigned low priority. Arrangements should be made to ensure that the controls are maintained.
Moderate Risk	4 – 8	Medium	Consideration should be given as to whether the risks can be lowered, but the costs of additional risk reduction measures should be taken into account. The risk reduction measures should be implemented within a defined time period. Arrangement should be made to ensure that the controls are maintained, particularly if the risk levels are associated with extremely harmful consequences.
High Risk	09 – 14	High	Substantial efforts should be made to reduce the risk. Risk reduction measures should be implemented urgently within a defined time period and it might be necessary to consider suspending or restricting the activity, or to apply interim risk controls are maintained, controls. Arrangements should be made to ensure that the controls are maintained, particularly if the risk levels are associated with extremely harmful consequences and very harmful consequences.
	15 – 25	Very high	These risks are unacceptable. Substantial improvements in risk controls are necessary, so that the risk is reduced to an acceptable level. The work activity should be halted until risk controls are implemented that reduce the risk so that it is no longer

			very high. If it is not possible to reduce risk the work should remain prohibited.

Based on the Hazard identified within the unit and their Risk levels, HIRA has been prepared and is given in below table:

Table 7-4 Hazard Identification and Risk Assessment (HIRA)

S. No.	Activity	Hazard	Risk	Risk Level	Proposed Safety System
1	Incineration Plant	• Fire • Burn • Explosion	• Loss of Life • Injury • Property Loss • Health problem to the workers	High	• Fully Automatic • Emergency Local Stop • Personal Protective Equipments • Fire Extinguisher (CO_2) will be provided. • Fire hydrant system will be provided. • Emergency Provision for Fire Brigade from outside source. • Periodic inspection and maintenance.
2	Auto-clave	• Small Fire	• Injury • Property Loss • Health Hazard	Medium	• Fully automatic Computer based automation will be provided. • Emergency Local Stop • Personal Protective Equipments • Periodic inspection and maintenance.
3	Storage are a of fuel	• Small Fire	• Injury • Property Loss • Health problem to the workers	Medium	• Dedicated storage area provided for storage of Fuel. • Fire detection system and alarm system will be provided. • Adequate capacity fire extinguisher (Foam type and ABC type) will be provided. • Smoke detection and alarm system will be

					provided. • Periodic inspection and maintenance of all equipments and instruments will be done.
4	Waste oil generated	• Fire hazard/ Slippage hazard	• Fire hazard • May impact well-being of person due to	Low	• Proper house keeping • No smoking/any other ignition source while handling waste oil • SOPs to be strictly followed.
			slippage.		
5	Electrical System	• Exposure to electrical shocks • Scope of fire due to electrical short circuits • Exposure to burns due to electrical systems • Property loss	• Injury • Property Loss • Health problem to the workers	Medium	• Safety fencing will be provided to control the direct contact of workers. • Only authorized persons with adequate PPEs will permit to access the area. • Adequate fire protection system will be developed. • Good housekeeping practices will be done. • Safety sign board will be provided. • Adequately rated and quick response circuit breakers, aided by reliable and selective digital or microprocessor based electromagnetic protective relays would be incorporated in the

					electrical system design for the proposed activities. • Proper design of electrical equipment as per standards/ HAC and proper isolation to eliminate these Hazards.
6	During mechanical repair work in different units	• Unsafe Practices/ Design/ Condition	• Injury	Medium	• The plant machinery comprises of standard engineering designs meeting all quality specifications. Since most accidents occur due to human error and improper work practice, safety awareness workshop for the plant personnel will be organized on regular basis. Workers will be encouraged to wear and use appropriate safety wearable/equipments like safety shoes, gloves, helmets, aprons, safety goggles and safety belts. • SOPs to be strictly followed.
7	Road area	• Accident may	• Injury • Property	High	• Vehicle Speed (not more than 20 km/hr) will be maintained inside the plant.
		happen	Loss		• Speed breakers will be provided. • Drink and drive will be strictly prohibited. • Sufficient parking area will be provided. • Proper maintenance of the road will be done. • Safety sign boards will

					be provided. • Trem card will be provided to all drivers and related employees.
8	Exposure during waste receiving, transportation, loading unloading and treatment	• Accident may happen • Health hazard	• Injury • Property Loss • Health problem to the workers	High	• Trem card will be provided to all drivers and related employees. • Trained person to be engaged for unloading and loading activities. • Trainings to be provided time to time.

In addition to above control measures following safety measures will be taken:

- Yearly third party safety audit will be conducted and all findings will be corrected strictly;
- EHS cell will be provided;
- PPEs record will be maintained;
- Work permit system will be strictly followed;
- Timely Hazard Identification and Risk Assessment (HIRA) study will be conducted, if any modifications happens in plant;
- Proper maintenance of fire hydrant system will be done;
- Safety trainings will be conducted;
- Periodically safety mock drill will be conducted and
- Safety sign board in dedicated area will be provided (related to associate Hazard and Risk).

- **Risk Reduction Summary**
- The preliminary risk assessment has been completed for the proposed project of the plant and associated facilities. The hazardous event scenarios and risks in general at this facility can be adequately managed to acceptable levels by performing the recommended safety studies as part of detailed design, applying recommended control strategies and implementing a Safety Management System.

Recommended approach to combat with the Possible Accidents

Considering all possible accident scenarios as analyzed in the risk analysis, it is established that there are potential hazards for handling of hazardous chemicals. So, the project authorities should be well prepared to handle any such eventuality described below:

In case of Fire/Explosion:

The following measures and actions are to be taken:

- Evacuate the area in vicinity;
- Take all necessary actions to avoid escalation of the accident;
- If problem appears to be out of control, call fire brigade and police. Report to district collector, etc.; and
- Provide first aid to the victims as suggested in the Material Safety Data Sheets.

Disaster Management Plan

The objectives of DMP is to describe the company's emergency preparedness, organization, the resource availability and response actions applicable to deal with various types of situations that can occur at facility in shortest possible time.

Thus, the overall objectives of the emergency plan are summarized as:-

- Rapid control and containment of hazardous situation.
- Minimizing the risk and impact of event/ accident.
- Effective prevention of damage to property.

In order to achieve the objectives of emergency planning effectively, the critical elements that form the backbone of Disaster Management Plan (DMP) are:

- Reliable and early detection of an emergency and immediate careful planning
- The command, co-ordination and response organization structure along with availability of efficient trained personnel.
- The availability of resources for handling emergencies.
- Appropriate emergency response action.
- Effective notification and communication facilities.
- Regular review and updating DMP.
- Training of the concerned personnel.
- Steps taken for minimizing the effects may include rescue operations, first aid, evacuation, rehabilitation and communicating promptly to people living nearby.

Emergency Under Natural Disasters:

A) Flood Warnings

A typical flood warning time is around 30 to 60 minutes by Govt. Sample flood warning messages are:

- Flood Alert – Flooding is possible
- Flood Warning – Flooding of homes, businesses and main roads is expected
- Severe Flood Warning – Severe flooding may cause imminent danger
- All Clear – No Flood Alerts or Warnings are in force

B) Earthquake

The latest version of seismic zoning map of India assigns 4 levels of Seismicity for India in terms of Zones, which means India is divided into 4 zones. Zone 5 is highly prone to the Earthquake which the highest level of seismicity whereas zone 2 is associated with the lowest level of seismicity. The proposed facility lies in Zone IV (Earthquake sensitive zone). For all the above mentioned disasters, the entity shall help District Disaster Management Authority (DDMA) in finalizing the full drawn map of facilities and nearby areas under their operations having presence of habitats which are vulnerable and sensitive like old age homes, schools, prison, etc.

Conclusion

As discussed in above sections, adequate risk control measures for process needs to be considered for the proposed project activity is not likely to cause major significant risk to onsite, offsite & environment. Suitable Mitigation Measures will be taken by PP to ensure complete workplace safety. In the event of disaster onsite, offsite and all the emergency planning procedures will be followed so as to minimize the impact on working personnel, plant surrounding and environment.

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CHAPTER-8 : PROJECT BENEFIT

8.1 Introduction

The concern about indiscreet disposal of infectious biomedical wastes generated by the HCF's is increasing rapidly due to the fear of the spread of viruses such as Acquired Immune Deficiency Syndrome (AIDS), Hepatitis B and various other diseases. To prevent the spread of such diseases, a scientific approach is required. It is essential that professionally trained personnel should handle the wastes and that the wastes should be disposed scientifically. At the same time they permit the Hospitals to dispose- off their Bio- medical wastes in safe & secured manner.

It has been made mandatory by the government to dispose-off waste in a systematic and scientific way and pollution control boards have been given the responsibility to ensure it. For systematic & scientific disposal of Bio-medical wastes, a facility has to be developed where BMW to be taken to avoid any negative effects on the environment. Similar is the case with other wastes like Hazardous waste and E-waste.

The proper bio-medical waste management will help to control nosocomial diseases (hospital acquired infections), reduce HIV/AIDS, sepsis, and hepatitis transmission from dirty needles and other improperly cleaned / disposed medical items, control zones (diseases passed to humans through insects, birds, rats and other animals), prevent illegal repacking and resale of contaminated needles, cut cycles of infection and avoid negative long-term health effects like cancer, from the environmental release of toxic substances such dioxin, mercury and others.

8.2 Improvements in the Social Infrastructure

Agriculture & plantation are one of the basic sectors of employment for the local people in this area. The project will lead to indirect and direct employment opportunity. Employment is expected during construction and operation period, waste lifting and other ancillary services. Employment in these sectors will be temporary or contractual and involvement of unskilled labor will be more. A major part of this labor force will be mainly from local villagers who are expected to engage themselves both in agriculture and project activities. This will enhance their income and lead to overall economic growth of the area.

The following changes in socio-economic status are expected to take place with this project.

- The project is going to have positive impact on consumption behavior by way of raising average consumption and income through multiplier effect.
- The project is going to bring about changes in the pattern of demand from food to non-food items and sufficient income is generated.

Industrial development and consequent economic development should lead to improvement of environment through better living and greater social awareness. On the other hand, the proposed project is likely to have several benefits like improvement in direct & indirect

employment generation and economic growth of the area, by way of improved infrastructure facilities, improving the aesthetic value of the environment by developing of the greenbelt area and better socio-economic conditions. Better hygienic conditions, as Bio medical waste with solid waste being dumped at several places will be brought to one place for further treatment and scientific disposal.

8.3 Employment Generation

The main advantage of the proposed project is direct employment generation

- absorbs rural labor and unskilled workers (in addition to semi-skilled and some skilled)
- provides opportunity for seasonal employment thereby supplementing workers' income from farming
- permits participation of women workers both during construction and operation phase. The maximum benefit will be for local villagers as they are easily accessible. Additionally, it is estimated that good number of jobs will be created as an indirect employment opportunity at local/regional level due to contractual, marketing and associated jobs directly with the project. The other related employment due to transportation requirement, supply of essential items and services to the project site and other community services will be plenty.

Employment in these sectors will be permanent based on own initiatives and interest of the individual. Involvement of unskilled labor requirement will be continuous basis depending on the requirement of contractor at site. A major part of this labor force will be hired from nearby places.

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CHAPTER-9 : ENVIRONMENTAL COST BENEFIT ANALYSIS

This Chapter has not been prescribed in the ToR issued by SEIAA, Odisha.

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CHAPTER-10 : ENVIRONMENTAL MANAGEMENT PLAN

10.0 INTRODUCTION

Environmental Management Plan or programme (EMP) that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored.

The EMP will address the environmental impacts during the design, construction and operational phases of a project. Due regard must be given to environmental protection during the entire project. In order to achieve this number of environmental specifications/recommendations are made. These are aimed at ensuring that the owner maintains adequate control over the project in order to:

- Minimize the extent of impact during construction.
- Ensure appropriate restoration of areas affected by construction.
- Prevent long term environmental degradation.

10.1 ENVIRONMENTAL MANAGEMENT CELL

The Environmental Cell will be headed by the Project Head followed by other officers and technicians. The cell will be the nodal agency to co-ordinate and provides necessary services on environmental issues during operation of the project. and shall be responsible for implementation of environmental management plan, interaction with the environmental regulatory agencies, reviewing draft policy and planning. The cell interacts with State Pollution Control Board and other environment regulatory agencies. The Environment department also interacts with local people to understand their problems and to formulate appropriate community development plan. The cell will also be responsible for monitoring of the plant safety and safety related systems which include:

i. Checking of safety related operating conditions.
ii. Inspection of safety equipment's.
iii. Preparation of a maintenance plan and documentation of maintenance work specifying different maintenance intervals and the type of work to be performed.

Other responsibilities of the cell will include followings:

- Conduct and submit annual Environmental Audit. A SPCB registered agency will be retained to generate the data in respect of air, water, noise, soil and meteorological data and prepare the Environmental Audit report. Timely renewal of Consolidated Consents & Authorization (CC & A) will also be taken care of.
- Submitting environmental monitoring report to SPCB. Data monitored by the cell will be submitted to the Board regularly and as per the requirement of SPCB. The cell will also take mitigative or corrective measures as required or suggested by the Board.

- Keeping the management updated on regular basis about the conclusions/results of monitoring activities and proposes measures to improve environment preservation and protection.
- Conducting regular safety drills and training programs to educate employees on safety practices. A qualified and experienced safety officer will be responsible for the identification of the hazardous conditions and unsafe acts of workers and advise on corrective actions, organize training programs and provide professional expert advice on various issues related to occupational safety and health.
- Conducting safety and health audits to ensure that recommended safety and health measures are followed

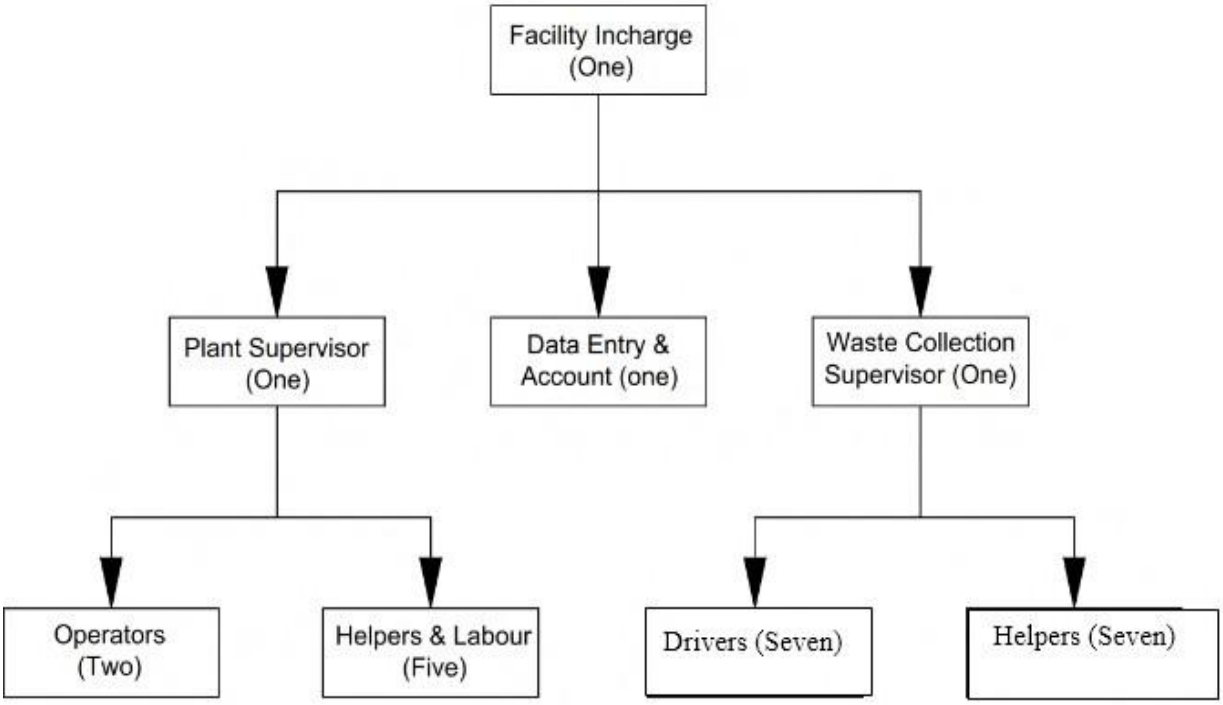

Figure 10-1: Proposed Hierarchy of Plant

Environment Management Plan is given in table below-

Discipline	**Environmental Hazard**	**Mitigation measures And Action Plan (Treatment & Disposal)**	**Administrative Aspect**	
			Implementation	**Monitoring**
Collection of Biomedical Waste	Biomedical waste is infectious in nature has hazard for causing infectious diseases, like cholera, typhoid, infective hepatitis, etc.	M/s MKD Eco Clean Pvt. Ltd. will be collecting segregated biomedical waste in colour coded bags which will be further kept in the containers, it will be collected from different hospitals on a daily basis. The segregated waste will be brought to the CBMWTF in a closed dedicated vehicle. Trained persons engaged in collection shall be provided with personal protective equipment to protect themselves.	Site Incharge/site engineer	QA/Chemist
Transportation of the collected bio-medical waste to the CBWTF.	Accidental spillage, contamination of soil, water, air. Chances of infection to personal handling waste.	The bio-medical waste collected in colored containers shall be transported to the CB TF in a dedicated fully covered vehicle. The vehicle provided will be covered and secured against accidental opening of door, leakage/spillage etc. Trained persons engaged in transportation shall be provided with personal protective equipment to protect themselves	Site Incharge	
Storage of Untreated Waste	-Do-	The storage building is an enclosed structure with sufficient ventilations. The biomedical waste can be directly stored in dumper containers with lids of suitable size. Trained persons engaged in handling of waste shall be provided with personal	Site Incharge	

		protective equipment's to protect themselves		
Storage Treated Waste	-Do-	After autoclaving the wastes will be segregated and it will stored in the treated waste storage area after being shredded. Plastic waste will stored after shredding. Plastics, metals, glass will be stored separately. Waste having recycle value will be sold to registered or authorized recyclers	Site Incharge	
Disposal of waste	-Do-	i. Disposal of waste such as plastic tools, metals, glasswares etc will be treated with the Autoclave and will be sent to the authorized recyclers after segregation and shredding. ii. Disposal of incineration ash through TSDF. iii. Disposal of ETP waste sludge to the TSDF site.	Site Incharge	
Human Anatomical Waste	-Do-	Incineration	Site Incharge	
Animal Anatomical Waste	-Do-	Incineration	Site Incharge	
Solid Waste	-Do-	After autoclaving the wastes will be segregated and it will stored in the treated waste storage area after being shredded. Plastic waste will stored after shredding. Plastics, metals, glass will be stored separately. Waste having recycle value	Site Incharge	

		will be sold to registered or authorized recyclers. Ash generated from the waste after treating with the help of incineration and Sludge generated from the ETP will be sent to the Secure landfill at TSDF Site.		
Expired or Discarded Medicines	-Do-	Expired cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or to disposal facility for incineration at >1200°C. All other discarded medicines shall be either sent back to manufacturer or TSDF Site.	Site Incharge	
Chemical Waste	-Do-	Disposed off by incineration	Site Incharge	
Discarded linen, mattresses, beddings contaminated with blood or body fluid	-Do-	Non- chlorinated chemical disinfection followed by incineration. In absence of above facilities, shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery or incineration.	Site Incharge	
Microbiology, Biotechnology and other clinical laboratory waste	-Do-	Pre-treat to sterilize with non-chlorinated chemicals on-site as per National AIDS Control Organization or World Health Organization guidelines thereafter for Incineration	Site Incharge	
Contaminated Waste (Recyclable)	-Do-	Autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent to	Site Incharge	

		registered or authorized recyclers or for energy recovery or plastics to diesel or fuel oil or for road making, whichever is possible. Plastic waste should not be sent to landfill sites.		
Waste sharps including Metals	-Do-	Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container or cement concrete; combination of shredding cum autoclaving; and sent for final disposal to iron foundries (having consent to operate from the State Pollution Control Boards or Pollution Control Committees) or sanitary landfill or designated concrete waste sharp pit.	Site Incharge	
Glassware	-Do-	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.	Site Incharge	
Metallic Body Implants	-Do-	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.	Site Incharge	
Water Quality	-Ground water pollution -Contamination of ground	-Monitoring groundwater at upstream and downstream of the site -Groundwater monitoring surrounding the site as per pre designed plan.	Site Incharge	QA/Chemist

	Water	-The performance of the ETP must be closely monitored to clearly assess the effluent loads from the facility. This is especially so viewing the heavy rainfall in the region and also a need to assess the pattern of biomedical waste disposal at the site. The modulator construction of the ETP to be considered so as to enable add-on of modules at a later date without disrupting operations.		
Air Quality	Air pollution (Fugitive, Dust and gaseous emissions)	-Ambient Air Monitoring for various parameters at the site and surroundings -Water Dumpers, sprinklers are deployed for water spraying. -Tree plantation around the facility area and along the roads. -Respirable dust samples are collected and analyzed periodically to ensure that the dust concentration limit is contained within the allowable limits	Site-Incharge	QA/Chemist
Soil Quality	Soil pollution	-Soil sampling from various locations and analysis.	Site-Incharge	QA/Chemist
Noise	Noise pollution (Noise levels during construction phase will be high during operational phase due to instrumental work, increased truck	These negative impacts are short term. -Equipment to be kept and maintained in proper condition to keep the noise level within 75 dB(A). -Workers will be provided with necessary protective equipment e.g. ear plug, earmuffs.	Site-Incharge	QA

	movement, earth movers etc.	-Provision of green belt and plantation would further help in attenuating noise.		
TRAFFIC	Traffic Impacts	Proposed project has no much traffic persists on the road, no traffic overcrowding is expected and the impact will be insignificant.	Site-Incharge	QA
SOCIOECONOMIC	Socio-Economic Impacts	The site selected for the treatment and disposal of biomedical wastes is not having any visible adverse impact on human population as well as live stock as this site is excluded from any agriculture, forest, or animal grazing land. -With the setting up of the biomedical waste treatment facility (CBWTF), there will be additional employment opportunities for about 15 persons (Construction phase) and about 48 persons (Operational phase). In general, the project is to have positive environmental impacts by collecting, treating and disposing the biomedical waste in the scientific manner, this will reduce the future health hazard.	Site-Incharge	EHS officer
FIRE AND SAFETY	Accidents/disasters related to fire and safety	- The proposed project of setting up of the Common Bio-medical Waste Treatment Facility (CBWTF) includes Incinerator, Autoclave, Shredder and Effluent Treatment Plant. It is proposed to utilize	Site Incharge	EHS officer

		2.65 acres land for setting up of Biomedical Waste Treatment Facility. So, - Disaster management plan (DMP) is in place. -A well-laid fire-fighting system and fire extinguishers will be installed as per fire safety norms. -Regular fire safety training will be conducted. -Road/Fire Safety Week/National Safety Day/ Safety Week Celebrations are observed to improve the safety consciousness.		
HEALTH AND SAFETY	Injury	-The operators, who are in contact with the infectious waste generated, are continuously at risk during their working hours. Therefore, it is essential that adequate protection measures are provided against occupational health hazards. -All workers will be given necessary training in handling the biomedical waste and treatment equipment's before joining their job. Pre-placement medical examination, periodic examination and immunization for all the workers will be provided.	Site-Incharge	EHS officer

IMPACT ON AGRICULTURE AND LIVESTOCK	No Impact	- The proposed project of setting up of the Common Bio-medical Waste Treatment Facility (CBWTF). The area is a barren land without significant vegetation. Hence no impact on the agriculture is envisaged.		
STORM WATER	-	-The rainwater is going through the drainage system without any contamination.	Site Incharge	QA
GREEN BELT	-	-Adequate green belt will be provided by M/s MKD Eco Clean Pvt Ltd around the site. - The CBWTF will have a zone for green belt covering the periphery of the site. An area of about 0.34 acre has been allocated for this purpose. -Green belt will be properly maintained resulting in formation of a thick canopy of trees around the project site. About 875 numbers of saplings are recommended for developing the green belt to abate dust, noise, odour and soil erosion.	Site Incharge/Site Engineer	Contractors (CONSTRUCTION/O&M)

10.2 Odour Control Measures

Odor is a characteristic or quality of a substance that makes it perceptible to the sense of smell. Experts defines odor as "the perception experience when one or more chemicals come in contact with the receptors on the olfactory nerves and 'stimulate' the olfactory nerve." This definition is useful as it points out that odor is not a chemical or group of chemicals, but instead the human body's reaction to and perception of one or more chemicals (odorants).

Biomedical waste management facilities can generate odors due to purification under specific conditions. For effective odor management, it is to eliminate objectionable odors by reducing the frequency, intensity, duration, and offensiveness of odors that people/workers may experience. Offensive odors may emanate from several sources, including handing, storage of biomedical waste material which may be decomposed significantly prior to treatment in incineration and autoclaving.

Good housekeeping and timely treatment preferably within 24 hrs. will greatly reduce general site smell and reduce impact from odor which could lead to complaint from the local community, workers at site, and site users. Good practice includes;

A. Storage of waste in a confined area.

B. Speedy treatment and disposal of waste.

C. Regular Cleaning of areas of waste storage with detergents / spraying odor control chemicals

D. Consideration of prevailing wind direction while planning location of facility.

E. Plantation of Fragrances generating flowering trees.

10.3 Socio Economic Development Activities under CER

Corporate Environmental Responsibility (CER) policy would function as a built-in, self-regulating mechanism whereby business would monitor and ensure its support to ethical standards and international norms. Consequently, business would adopt responsibility for the impact of its activities on the environment, consumers, employees, Communities, Stakeholders and all other members of the public sector. CER focused businesses would proactively promote the public interest by encouraging community growth and development, and voluntarily eliminating practices that harm the public sector, regardless of legality.

CER is the management's commitment to operate in an economically, socially and environmentally sustainable manner, while recognizing the interests of its stakeholders. This commitment is beyond statutory requirements. CER is, therefore, closely linked with the practice of sustainable Development.

10.4 Monitoring of Safety and Health Protection

Specific programme to monitor safety and health protection of workers.

Specific Programme shall be done twice a year to monitor safety and health protection measures. The programme shall cover the following.

- Training about handling of waste shall be mandatory to workers. The periodical supervision shall also be done on handling of waste
- Providing adequate and appropriate Personal Protective Equipment (PPE) to the staff handling Bio Medical Waste
- Use of PPE while handling of Bio Medical Waste must be encouraged and must be monitored regularly to ensure occupational safety of staff
- The PPE includes
  - Heavy Duty Gloves (Workman's Gloves)
  - Gum Boots or safety shoes for waste collectors
  - Face mask, Head cap
  - Splash Proof Gowns or aprons etc.
  - Disposal gloves for waste handlers
  - Goggles
- Conducting health check-up of all the employees at the time of induction and also at least once in a year.
- Ensuring that all the staff of the health care facility involved in handling of BMW is immunized at least against the Hepatitis B and Tetanus after prescribed intervals
- Taking remedial steps in accordance to any accident occurred, leading to any harm to the employee, during the handling of Bio medical waste.

10.5 Budgetary Provision for Environment Management

To comply with the environmental protection measures as suggested in the above sections, the project management has made budgetary provision for environmental protection and safety measures.

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CHAPTER-11 : SUMMARY & CONCLUSION

11.1 Introduction

M/s MKD Eco Clean Pvt. Ltd. proposes a Common Biomedical Waste Treatment and Disposal Facility (CBWTF) in the state of Odisha for the proper handling and treatment of biomedical wastes from health-care facilities (HCFs). The registered office is at Plot no 143/3933, IHB Colony Po-Sisupalgarh, Bhubaneswar- 751002. Total land available for the project is 2.65 Acre (1.0725 Ha).

The proposed project is a green field project. The proposal is categorized as "Category B1", Schedule 7(da) as per amended EIA Notification 2006 and requires prior Environmental Clearance (EC) from the State.

Application for Terms of Reference (ToR) was applied on dtd. 01.10.2024 and ToR was issued on Dt. 24.03.2025 vide file no 498744/54-INFRA2/10-2024 by SEIAA, Odisha. The objective for the proposed project is to establish a Common Bio-medical Waste Treatment facility including the Incinerator, autoclave, shredder and effluent treatment unit to handle 7250 kg/day of medical waste.

11.2 Brief Description

The objective for the proposed project is to establish an Integrated Common Bio-medical Waste Treatment facility including the Incinerator, autoclave, shredder and effluent treatment unit to handle 7250 kg/day of medical waste. The salient features of the proposal are as follows.

1	Name of the Company	**M/s MKD Eco Clean Private Limited**
2	Registered Office Plant & Admin Office	**Project Site:** Plot No.553/1081, 555,556, 557, 559, 560, 561, 562, 563, ,655, 566, 567 khata no. 123/124, Mauja- Asanbahali Tehsil/Thana Gondia -District: Dhenkanal, Odisha **Admin Office:** Plot no 143/3933, IHB Colony Po-Sisupalgarh, Bhubaneswar- 751002
3	Name of the Directors	Mr. Lipshit Dash
5	Area of plant	2.65 Acre (1.0725 ha)
6	Topo Sheet No	F45T13
7	Latitude	21° 1'27.03"N
8	Longitude	84°24'41.22"E

9	Proposed Units& Total Capacity	➢ Autoclave – 400 kg/batch ➢ Shredder – 200 kg/hr ➢ Incineration – 500 kg/hr ➢ ETP – 10 KLD
11	Cost of Project	INR 1.8 Crore
12	Working Days	365
13	Life Span of CBWTF	25 Years

Water Requirement

The total water requirement for the project is 12 KLD and its source will be from Ground water.

Power Requirement

The power required for the facility is 120 kVA and will be procured from Tata Power Central Odisha Distribution Limited (TPCODL). For emergency backup, a 1 DG set (100 KVA) will be there.

Required Manpower

On contract basis the labors and workers will be hired from nearby villages in construction phase and 50 persons are proposed to hire including skilled and unskilled for the proposed project during operational phase.

Project Cost

The cost of the project is approx. INR 1.8 Crore.

11.3 Treatment Technology

Incineration

Incineration is a waste treatment process that involves combustion of substances contained in waste materials. As being high temperature thermal process employing combustion of the waste under controlled condition for converting it into inert material and gases. Incinerators will be oil fired and has primary and secondary combustion chambers to ensure optimal combustion. These are refractory lined. The temperature of Primary and Secondary chambers shall be maintained 800°C ±50°C and 1050±50°C respectively. Solid phase combustion takes place in the primary chamber whereas the secondary chamber is for gas phase combustion. Thus, the waste is incinerated in two stages i.e. the primary chamber and the secondary combustion chamber which are positioned adjacent to each other. The flue gases then pass through the high-pressure drop ventury scrubber, droplet separator and are let out to atmosphere via ID fan and chimney.

The emission from incineration after APCD shall meet the stipulated Standard.

Shredder

Shredding is a process by which waste are de-shaped or cut into smaller pieces so as to make the wastes unrecognizable. Shredder has non- corrosive sharp blades capable for shredding of plastic wastes, bottles, syringes, tubings and other general wastes. The low speed two shaft systems is effective for shredding hard and solid wastes.

Autoclave

An autoclave is a specialized piece of equipment designed to deliver heat under pressure in 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 disposal. Such items include, but are not limited to: culture media, surgical instruments, laboratory equipment, glassware, and biomedical waste including sharps.

Air Pollution Control Device (APCD)

The gases after being burnt at 1050°C in incinerator shall be run into a ventury scrubber, an air pollution control device followed by a flooded scrubber with water quenching arrangement. The scrubber shall be an alkaline scrubber to neutralize the gases and ensure trapping of any pollutants escaping into the environment. The purpose of water quenching is to reduce the temperature of the gases which are at high temperature. The clean gases are let out into the environment.

The Incinerator will be provided with a stack height (minimum 30m height) along with online monitoring system, quencher, venturi scrubber, and alkaline wet scrubber.

11.4 Description of Baseline Environment

Air Environment

Respirable Particulate Matter (PM_{10}):

A maximum value of 76.3 µg/m^3 was observed at Village Balrampur (AAQ-2) and minimum value of 52.9 µg/m^3 was observed at Asand Bahali (Sensitive-Near Forest) (AAQ-6). The average values were observed to be in the range of 62.0 to 68.8 µg/m^3 and the 98% tile was observed by in the range of 68.4 to 75.7 µg/m^3.

Particulate Matter ($PM_{2.5}$):

A maximum value of 40.1 µg/m^3 was observed at Village Nihalprasad (AAQ-5) and minimum value of 24.2 µg/m^3 was observed at Asand Bahali (Sensitive-Near Forest) (AAQ-6). The average values were observed to be in the range of 30.4 to 37.5 µg/m^3 and the 98% tile was observed by in the range of 34.4 to 39.6 µg/m^3.

Oxides of Nitrogen (NOx):

Maximum concentration of NO_2 is observed to be 18.3 µg/m^3 at Bega (Habition) (AAQ-8) and minimum value of 8.3 µg/m^3 observed at Balikiari (Sensitive) (AAQ-7). The average

values were observed to be in the range of 11.1 to 15.9 µg/m^3 and the 98% tile was observed by in the range of 15.0 to 18.3 µg/m^3.

Sulphur Dioxide (SO_2):

Maximum concentration of SO_2 is observed to be 8.6 µg/m^3 at Village Karanda (AAQ-4) and minimum value of 4.0 µg/m^3 observed at Bega (Habition) (AAQ-8). The average values were observed to be in the range of 5.4 to 7.3 µg/m^3 and the 98% tile was observed by in the range of 6.4 to 8.6 µg/m^3.

Carbon Monoxide (CO):

Maximum concentration of CO is observed to be 390 µg/m^3 at Village Nihalprasad (AAQ-5) and minimum value of 110 µg/m^3 observed at Asand Bahali (Sensitive-Near Forest) (AAQ-6). The average values were observed to be in the range of 193 to 303 µg/m^3 and the 98% tile was observed by in the range of 275 to 390 µg/m^3.

Water Environment

Ground Water Quality

The pH values observed were in the range of 6.97 to 7.89; with total dissolved solid ranging from 157 mg/l to 445 mg/l. Total Hardness was in the range of 97 mg/l to 248 mg/l. The concentration of alkalinity was in the range of 74 to 203 mg/l.

Surface Water Quality

The pH values observed were in the range of 7.57 to 7.63 with total dissolved solids in the range of 200 mg/l to 210 mg/l. BOD were observed less than 28.5 mg/l. Chloride varied between 37 mg/l to 38 mg/l. Sulphates varied from 18 to 20 mg/l, Nitrate varied from less than 0.9 to 1.1 mg/l.

Soil Environment

It has been observed that the pH of the soil ranged from 6.78 to 7.49 indicating that the soils are slightly alkaline to moderately alkaline in nature. The electrical conductivity was observed to be in the range of 171 to 221 µS/cm.

The nitrogen concentrations are in the range of 38 to 45 mg/kg. The phosphorous concentrations are in the range from 5.3 to 7.9 mg/kg.

11.5 R&R

There is no displacement of any houses, habitation or livestock. Thus the project does not require any R & R plan.

11.6 Budgetary Provision for EMP

Environmental Management Plan or programme (EMP) that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored. The EMP will address the

environmental impacts during the design, construction and operational phases of a project. Due regard must be given to environmental protection during the entire project. In order to comply with the environmental protection measures as suggested in the above sections, the project management has made budgetary provision for environmental protection and safety measures. Cost towards environmental mitigation measures allocated is INR 30 lakh as capital investment and recurring cost of INR 7.5 lakh per annum.

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CHAPTER-12 : DISCLOSURE OF CONSULTANT ENGAGED

12.1 INTRODUCTION OF ORGANIZATION

GRC India is an ISO 9001:2015, 14001:2015 & ISO 45000:2018 certified pioneer environmental consultancy organisation in India. It has been accredited by National Accreditation Board of Education & Training (NABET), Quality Council of India (QCI), which is the highest accreditation authority in India. Accreditation is the formal recognition by an accreditation authority to carry out a specific service in accordance with the standards and technical regulations as prescribed in the scope of accreditation. The accreditation permits the organisation to carry out the Environment Impact Assessment (EIA) Studies for obtaining an Environmental Clearance for various development projects. This has been granted following a rigorous inspection based on a number of quality parameters applicable to concerned Environmental Functional Areas and the required infrastructure facilities available in the organisation, as prescribed by the MoEF&CC, Govt. of India in its guidelines.

The accreditation certificate number NABET/EIA/24-27/RA 0354 is valid till 16th August 2027. Copy of NABET certificate is attached as **Annexure-V** with EIA report.

Current Status of ACO is available on below given link:-

http://eia.nabet.qci.org.in/Accredited_EIA_Consultant.aspx

12.2 ADDRESS & CONTACTS

Corporate Office

F-374 and 375, Sector – 63, Noida-201301, UP
Phone: 91-120-4044630, 4044660, 4323120
Fax: 91-120-2406519
E-Mail: info@grc-india.com

Registered Office
Unit No.102, First Floor, Vardhman Mayur Market,
CSC-1, Mayur Vihar Phase 3, New Delhi – 110096,
Ph: 91-11-22622031,

12.3 EIA CORDINATOR AND FUNCTIONAL AREA EXPERTS

Name and address of the Consultant	GRC India (P) Ltd., F-374 & 375, Sector- 63, Noida, India	ISO 9001:2015 Certified, QCI-NABET Accredited
EIA Coordinator	Mr. Bijendra Srivastava	
Base line data	GRC India Training and Analytical Laboratory F-375, Sector- 63, Noida, India	Recognized by MoEFCC, GoI & Accredited by NABL.A unit of GRC India (P) Ltd.

The EIA/EMP report has been prepared under the guidance of following Coordinators & Functional Area Experts:

EIA Coordinator	Mr. Bijendra Srivastava	Coordinated the EIA Study and coordinated with FAE's data generation, assessment and report writing
FAE-AP	Dr. Dhiraj Kr. Singh Mr. Sonu	➢ Identifying the sources of emissions and mitigation measures. ➢ Inventorisation of point source stack emission details. ➢ Site specific micro- meteorology monitoring. ➢ Ambient Air Quality (AAQ)monitoring impact predictions and mitigations
FAE-WP	Ms. Mudita Tomar Singh Mr. Saurabh Gola	➢ Surface water and ground water quality monitoring and assessment. impacts on water ➢ Environment and mitigations. ➢ Identification, characterization of effluent streams and treatments thereof. ➢ Water balance and conservation measures
FAE-AQ	Ms. Mudita Tomar Singh Mr. Sonu	➢ Visited the site and surroundings, assessed the meteorological data, did predictions on air quality and suggested mitigation measures.
FAE-EB	Dr. Ashok Kumar Rathoure Ms. Kavita Chopra	➢ Biological environment status in respect of terrestrial fauna and aquatic eco system. ➢ Impact on ecological environment.
FAE-SE	Mr. Rajiv Rastogi	➢ Determination of baseline human environment. ➢ Impact on socioeconomic environment & mitigation methods.
FAE-HG	Prof. Tapan Majumder	➢ Ground water resource assessment. ➢ Impact on ground water potential and mitigation measures for avoiding ground water contamination.
FAE-GEO	Prof. Tapan Majumder	➢ Topography and geological aspects ➢ Developing geological maps
FAE-RH	Mr. S.K. Bandhopadhya	➢ Visited the site and surroundings, assessed the process details, identified risks / hazards and suggested mitigation measures.

FAE-SHW	Dr. Dhiraj Kr Singh	➢ Non-hazardous solid, wastes generation, recycling and disposal. ➢ Storage and management of hazardous solid waste
FAE- SC	Mr. Ashok Srivastava	➢ Monitoring, analysis & characterization of soil. ➢ Assessment of impact on soil quality and mitigation measures.
FAE – NV	Dr. K.L. Satapathy	➢ Analysis of ambient noise quality data. ➢ Impact due to plant noise and abatement measures.
FAE – LU	Mr. Punit Lal Mahato Mr. Devendra Kumar	➢ Analysis of data related to land-use pattern. ➢ Land-use map development. ➢ Impact on land environment in respect to land form change

Apart from EIA Coordinator and FAE's involved in the project the other technical staff involved in the preparation of EIA is listed below:-

Name of Internal Team Member	**Activity / Area**	**Involvement – Actual Work Performed**	**Under Approved Expert**
Ms. Devyani Swain (Team Member)	Assistance in EIA Report Writing FAA in EB & AP	Coordination for data collection & help in EIA documentation. Assisted FAE & EC for identification of impacts and mitigation measures.	Mr. Bijendra Srivastava

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Annexure-I

सत्यमेव जयते

File No: 498744/54-INFRA2/10-2024

Government of India

Ministry of Environment, Forest and Climate Change

(Issued by the State Environment Impact Assessment Authority(SEIAA), ODISHA)

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Dated **24/03/2025**

To,

Sri. Lipshit Dash, Authorized Signatory
M/s MKD Eco Clean Pvt.Ltd.
Plot no. 2849, at Tolarpasi, PO/Via-Gondia, Dhenkanal,Pin- 759016
alok@saibiocare.in

Subject: Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding.

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Establishment of a Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot no. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 565,566,567 Tehsil/thana-Gadai District. Dhenkanal, Odisha. submitted to SEIAA,Odisha vide proposal number SIA/OR/INFRA2/498744/2024 dated 01/10/2024.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B3301OR5491460N
(ii) File No.	498744/54-INFRA2/10-2024
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	7(da) Bio-Medical Waste Treatment Facilities
(vii) Name of Project	proposed Establishment of Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot No. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 565,566,567 located in Tehsil/Thana-Gadai,District- Dhenkanal
(viii) Name of Company/Organization	M/s MKD Eco Clean Pvt.Ltd.
(ix) Location of Project (District, State)	Tehsil/Thana-Gadai,District- Dhenkanal
(x) Issuing Authority	SEIAA,Odisha
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEAC, Odisha for an appraisal by the State Level Expert Appraisal Committee (SEAC) under the provision of EIA notification 2006 and its subsequent amendments thereto.

4. The above-mentioned proposal has been considered for TOR by SEAC in its meeting held on 24.02.2025. The minutes of the meeting and all the project documents as submitted by project proponent are available on Parivesh portal which can be accessed from the Parivesh portal by scanning the QR Code above.

5. The details of the project along with the salient features of the project as submitted by the project proponent in Form-1(Part A and B) and as presented before the SEAC are annexed to this TOR.

6. The SEAC, after detailed deliberations made by the Project Proponent and the EIA Consultant, in its meeting held on 24.02.2025 under the provisions of EIA Notification 2006 and its subsequent amendments, appraisal report is Annexed as Annexure- 2.

7. The matter was again examined in the State Environment Impact Assessment Authority (SEIAA), Odisha in its 192nd meeting held on 20.03.2025, appraisal report of SEAC and in accordance with the EIA Notification, 2006 and further amendments thereto. The authority deliberated on the submission of the PP and observed that since, there is no other facility which exists in Cuttack and in view of rapid urbanization and for better management of contagious biomedical waste in Cuttack District, the establishment of CBWTF at Choudwar Cuttack was previously approved. Further, the authority opined that transportation of Bio-medical waste is contagious and great risk when transported over long distances. After detailed deliberation, the authority approved the ToR with standard and specific conditions as recommended by SEAC for undertaking detailed EIA studies for establishment of CBWTF at Dhenkanal District. The standard and specific ToRs are attached as Annexure-1.

8. Terms of Reference (ToR) is granted to the project with public hearing under the provisions of EIA Notification No. S.O. 1533 (E) dated the 14th September, 2006 of the Government of India in the erstwhile Ministry of Environment and Forests, as amended from time to time for establishment of "Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot No. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 565,566,567 located in Tehsil/Thana-Gadai,District- Dhenkanal by M/s MKD Eco Clean Pvt.Ltd." for undertaking detailed EIA studies with the specific conditions as mentioned below along with standard conditions for preparation of EIA/EMP report for the project as given in Annexure- 1.

9. The SEIAA, Odisha reserves the right to alter /modify the above conditions or stipulate any further condition in the interest of environment protection.

10. The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

11. This issues with the approval of the Competent Authority.

Copy To

1. Joint Secretary (IA Division), Ministry of Environment, Forests and Climate Change Govt. of India, Indira Paryavaran Bhavan, Jor Bagh Road, Aliganj, New Delhi-110003 for information.
2. Additional Chief Secretary, Forests & Environment Dept., Government of Odisha for information.
4. Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-8, Bhubaneswar for information.
5. Additional Principal Conservator of Forests, Regional Office (RO), Ministry of Environment & Forests, A/3, Chandrasekharpur, Bhubaneswar for information.
6. Regional Director, CGWA, South Eastern Region, Bhujal Bhawan, Khandagiri, Bhubaneswar, Pin-751030.
8. Collector & DM, Dhenkanal, District-Dhenkanal for Information and necessary action.
9. Guard file for record/Website/Parivesh Portal.

Annexure 1

Specific Terms of Reference for (Bio-medical Waste Treatment Facilities)

1. Specific Conditions

S. No	Terms of Reference
1.1	i) Measures to be taken for collection of Bio Medical Wastes. ii) Details of equipments and their capacity to be installed in Project. iii) Details of amount of waste to be generated from the hospitals on the per day basis rather than calculating on number of beds. iv) Aerial distance certificate from the nearby biomedical waste treatment facilities. v) Precautionary measures to be undertaken to avoid contamination of wastes or due to surface runoff from project site to the nearby water reservoir. vi) Standard Operating Protocol starting from collection point of waste generation/raw material, segregation, transportation, treatment and disposal of waste generated from plant. vii) The baseline monitoring should also include biological parameters and baseline study should also cover the monsoon period. viii) The storage sheds provided for the biomedical waste should be covered. ix) Provide a buffer zone of 5km around the proposed site. x) A write up on the amount of segregated waste to be handled at the project site monthly and annually. xi) Avoid using transport route passing through the village. xii) SOP/measures to be followed for safety and health issues (due to handling of hazardous waste materials) of employees and local people of nearby villages. xiii) Area details to be cover for collection of waste materials/raw materials. xiv)Agreement papers or MoU with dealers for disposal of waste generated and its management. xv) Category wise list of wastes to be handled. xvi) Internal drainage plan of the project site for smooth discharge of excess rainwater along with excess treated water showing the location of its discharge point to the nearest public drain. The location of the nearest public drain also to be shown in the above-mentioned lay out map. xvii) Submission of a list of recognized Hospitals, Nursing Homes, Clinics along with the corresponding beds considered for this Project. xviii) Submission of documents for a prior arrangement with T.S.D.F for Hazardous Waste like incinerator ash, plastic recyclers for plastic wastes, metal foundries for recycling metal sharps, etc. xix)Adoption of OHSAS. xx) Leachate from land filling/ETP drains/ flow in details. stack emission and leachate chemical analysis. xxi)Location of the incinerator and DG set with respect to predominant wind direction vis - a - vis the habitation and public roads.
1.2	At the time of conducting EIA, the capacity of the incinerator may be fixed according to the availability of raw material within the location as per the different capacities of incinerator prescribed in the guidelines on CBMWF,2016 issued by CPCB in this regard.

Standard Terms of Reference for (Bio-Medical Waste Treatment Facilities)

1. Project Details

S. No	Terms of Reference
1.1	Importance and benefits of the project.

S. No	Terms of Reference
1.2	Reasons for selecting the site with details of alternate sites examined/rejected/selected on merit with comparative statement and reason/basis for selection. The examination should justify site suitability in terms of environmental damages, resources sustainability associated with selected site as compared to rejected sites. The analysis should include parameters considered along with weightage criteria for short-listing selected site.
1.3	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
1.4	Details of various waste management units with capacities for the proposed project. Details of utilities indicating size and capacity to be provided.
1.5	List of waste to be handled and their characteristics. Details of temporary storage facility for storage of Bio-medical waste at project site.
1.6	Other chemicals and materials required with quantities and storage capacities.
1.7	Detailed design of pre-treatment and waste stabilization facility of Biomedical waste.
1.8	Project proponents would also submit a write up on how their project proposal conform to the stipulations made in the Bio-Medical Waste Management Rules, 2016 , notified by the MoEF&CC on 28th March, 2016.
1.9	Process description along with major equipment and machineries, process flow sheet (quantitative) from Bio-Medical waste material to disposal to be provided.
1.10	Details of man-power requirement (regular and contract).
1.11	A detailed layout of the project site indicating all the project components.

2. Road And Traffic

S. No	Terms of Reference
2.1	Submit the details of the road/rail connectivity along with the likely impacts and mitigative measures
2.2	Examine the details of transportation of Bio-Medical wastes, and its safety in handling.

3. Land Environment

S. No	Terms of Reference
3.1	Detailed soil analysis of the site including its permeability, water holding capacity be included.
3.2	Submit the present land use and permission required for any conversion such as forest, agriculture etc

S. No	Terms of Reference
3.3	Specify the land area and space allotted for each activity proposed within the facility. The area requirements for each activity shall be calculated as per the CPCB guidelines for the specified activity.
3.4	Status of the land purchases in terms of land acquisition Act. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.
3.5	The EIA would address to the conformity of site to the stipulations as made in the Bio-Medical Waste Management Rules, 2016 and Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and will have a complete chapter indicating conformity to the said rules. NOC shall be obtained from State Pollution Control Board/Committee (SPCB/SPCC) regarding site suitability for establishment of Bio-Medical Waste Treatment Facilities.
3.6	Post project reclamation management program with financial allocation.

4. Environmental Monitoring And Management

S. No	Terms of Reference
4.1	Examine and submit the details of on line pollutant monitoring.
4.2	Project proponent must ensure Good Combustion Practice (GCP) to reduce the possibilities of formation of 'Total dioxins and furans'. In addition, GCP must be coupled with appropriate End-of-the-pipe treatment at low temperature to reduce the emission of 'Total dioxins and furans' below the standards. Further, the project proponent must provide detailed Standard operating procedure (SOPs) for sampling and monitoring of 'Total dioxins and furans'.
4.3	Environmental Management Plan should be accompanied with Environmental Monitoring Plan and environmental cost and benefit assessment. Regular monitoring shall be carried out for odour control
4.4	Water quality around the landfill site shall be monitored regularly to examine the impact on the ground water.
4.5	Air Quality Index shall be calculated for base level air quality.
4.6	Baseline data on Ground water quality is required.
4.7	Possible carbon footprint contribution from each activities and mitigation measures proposed shall be included as part of Environment Management Plan.

5. Waste Management

S. No	Terms of Reference
5.1	Examine and submit details of the proposed odour control measures.
5.2	The storage and handling of Bio-Medical wastes shall be as per the Bio-Medical Waste

S. No	Terms of Reference
	Management Rules, 2016.
5.3	Details of storage and disposal of pre-processing and post-processing rejects/inerts and products. List of proposed end receivers for the rejects/inerts/products should be provided. MoUs to be submitted in this regard.
5.4	Details of hazardous/solid waste generation and their management.

6. Water Environment

S. No	Terms of Reference
6.1	Detailed hydro-geological studies and possible impact if any accidental contamination occurs shall be included.
6.2	Examine and submit details of monitoring of water quality around the landfill site.
6.3	Examine and submit details of impact on water body and mitigative measures during rainy season.
6.4	Details of Drainage of the project up to 5 km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided.

7. Water Management

S. No	Terms of Reference
7.1	Details of effluent treatment and recycling process.
7.2	A certificate from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.

8. Energy Management

S. No	Terms of Reference
8.1	A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project.

9. Disaster Management Plan

S. No	Terms of Reference
9.1	Submit details of a comprehensive Disaster Management Plan including emergency evacuation

S. No	Terms of Reference
	during natural and man-made disaster.
9.2	Hazard identification and proposed mitigation measures.

10. Green Belt

S. No	Terms of Reference
10.1	A detailed Plan for green belt development.

11. Socioeconomic Environment

S. No	Terms of Reference
11.1	Public hearing to be conducted for the project in accordance with provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the SEIAA,Odisha and not on the basis of Minutes of the Meeting available on the web-site.
11.2	The project proponents shall satisfactorily address all the complaints/suggestions that have been received against the project till the date of submission of proposals for Appraisal.

12. Court Cases

S. No	Terms of Reference
12.1	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

13. Miscellaneous

S. No	Terms of Reference
13.1	NABET accredited consultant certificate along with consent letter that he has prepared the EIA & EMP report of the proposed project.
13.2	The Project Proponent should submit the EIA/EMP report as per the generic structure prescribed in Appendix-III of the EIA Notification,2006 after incorporating the details of public hearing conducted and covering the above-mentioned issues, to take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification,2006.
13.3	Baseline data and public consultation shall not be older than 3 years, at the time of submission of the proposal, for grant of Environmental Clearance. The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP report, as per the Notification S.O.751(E) dated 17.02.2020. The instant TOR is valid up to four years from the date of issuance of TOR.

Annexure-2

1. Proposal in brief:

The highlights of the proposal as ascertained from the application and as revealed from proceedings/discussion held during the meeting of SEAC/SEIAA, are given as under.

(i) This is a proposal of M/s MKD Eco Clean Pvt.Ltd. for grant of Terms of Reference (ToR) for obtaining Environmental Clearance for proposed Establishment of Common Bio-Medical Waste Treatment Facility (CBWTF) at Plot No. 553/1081, 555, 556, 557, 559, 560, 561, 562, 563, 565,566,567 located in Tehsil/Thana-Gadai,District- Dhenkanal filed by Sri. Lipshit Dash, Authorized Signatory.

(ii) Category: This project falls under Category "B" of Project activity 7 (da) - Development of Common Bio Medical Waste Treatment Facility projects as per EIA Notification dated 14th Sept, 2006 as its amendments vide Gazette Notification S.0. 1142(E) dated 17th April 2015.

(iii) Project details: The proposed project will cater from 473 healthcare units consisting of 7879 Nos. of beds with estimated Biomedical waste of 7250 kg /day. Incinerator capacity-300KG/hr & 400 KG/hr (2nos.), Autoclave capacity-0.50 m3 (2nos.), Shredder capacity-200Kg/hr 2nos., Ash Pit - -- Sharp Pit - Effluent Treatment Plant 10 KLD -1nos.

(iv) Location and connectivity: The proposed site is located at Plot No. 553/1081, 555,556, 557, 559, 560, 561, 562, 563, ,655, 566, 567 Khata no. 123/124, Tehsil/PS Gondia, Mauja-District: Dhenkanal, Odisha bearing Toposheet No. F45UI, F45U2, F45T13 & F45T14. There is no National Park and Wildlife Sanctuary within 10 km radius of the project site. Nearest Airport is Biju Patnaik International Airport: 85.0 km towards SSW. Nearest NH is NH 53 is 6.5 km towards ENE and Kashipur-Nihalprasad Road is at 1.3 km towards. Nearest Village is Asand Bahali at 0.9km towards NNE, nearest Town/City is Cuttack City at 40.0km towards SSE. Nearest Railway Station is Jenapur Railway Station at 10.30km towards SSE. Nearest water bodies/rivers are Brahmani River is at 4.2 km towards NW and Kuaraia Nala 6.5 km towards SSW. The geographical coordinates of the project site are mentioned in the Table.

(v) Water requirement and wastewater management: Total daily water requirement is 12.05 KLD, fresh water requirement is 9.35 KLD; Recycled water demand is 2.7 KLD. Source for required water is Ground water. 3 KLD of process water to be directed to proposed ETP & treated water will be recycled for scrubbing water makeup and 1.8 KLD of domestic water to be directed to soak pit followed by septic tank. Effluent generated will be treated in effluent treatment plant (ETP –10 KLD).

(vi) Details of waste generated and its management: In case of MSW, 15 Kg/day to be collected & segregated using colour coded bins for final disposal to municipal waste disposal site. Ash from incinerator and flue gas cleaning residue to be disposed off to nearest TSDF. 0.4 KLD of ETP Sludge is to be disposed off to nearest TSDF. Used oil or spent oil will be approx. 5 litres per month to be handed over to authorized recyclers. Estimated Biomedical waste will be 7250 kg /day.

(vii) Baseline Study Details: Baseline study has been conducted during October 2024 to December 2024 (Post Monsoon).

(viii) Power requirement: Total Power requirement of the proposed building is 40 KW, Source is TPCODL. Items Details Power Requirement & Source Power Requirement: 40 KW Source: TPCODL Power backup Number: 01 Numbers Capacity: 60 kVA Fuel : HSD Fuel Requirement : 30 lt/hr

(ix) Green Belt Development: Greenbelt will be developed over an area of 3539.25 sq.m which is 33 % of the total plot area. Plant area 3110.25 sq.m 29% Green area 3539.25 sq.m 33%, Road, paved and open area 4075.50 sq.m 38%, Total **10725 sq.m 100 %.**

(x) Total Employment: 50 numbers of Persons will be used as manpower for the proposed project

(xi) Project cost: The total estimated cost of the proposed project is 1.80 Crore.

(xii) Environment Consultant: The Environment consultant M/s Gaurang Environmental Solutions Pvt. Ltd., Jaipur along with the proponent made a presentation on the proposal before the Committee.

(xiii) The SEAC in its meeting held on dated 22-11-2024 recommended the following:

A. The proponent may be asked to submit the following for further processing of TOR application:

i. The Project Proponent was absent and Representative of Project has attended the meeting on behalf of Project Proponent. Submit Authorization Letter from Project Proponent.

ii. Certificate from the appropriate authority certifying that no other Common Biomedical Waste Treatment Facility is present within 75 kms radius of the proposed project.

- The following may be prescribed as specific ToRs if decided to issue ToRs.

(i) Supporting land documents in name of the company. Tabulated form of the land schedule plot wise with Kissam of land.

(ii) Note on road connectivity to the project site. NOC/Permission from concerned authority or authorization/ownership given to PP/Company by private owners for the land whichever applicable, for approach road for transportation of minerals.

(iii) CGWA permission for ground water withdrawal.

(iv) As per Toposheet, 40meters is Baliposhi Reserve Forest as submitted by PP. Distance certificate of the Baliposhi Reserve Forest from the project site duly certified by concerned DFO.

(v) There is a road passing through the project site. Type of road to be mentioned.

(vi) Project Proponent shall ensure Zero Liquid discharge for the proposed project.

(vii) Details of the Healthcare units from which the Biomedical wastes will be collected.

(viii) Layout of storm water drainage system.

(ix) Details of Solar energy and Parking proposed for the project.

(x) Protection and mitigation measures for the landfill.

(xi) Source of water and the quantities proposed to be used in the operational phase of the project along with permission / authorisation from appropriate authorities

(x) Any deficiencies/omission have been noticed in the above documents-Not submitted scrutiny fee and DLC certificate of proposed land.

2. **Whether SEAC recommended the proposal** – Yes. The proposal was placed in the SEAC meeting held on 24.02.2025 and considering the information / documents furnished by the proponent and presentation made by the consultant M/s Gaurang Environmental Solutions Pvt. Ltd., Jaipur, the SEAC prescribed the standard ToRs for conducting detailed EIA study with following specific ToRs:

(i) Measures to be taken for collection of Bio Medical Wastes.

(ii) Details of equipment and their capacity to be installed in Project.

(iii) Details of amount of waste to be generated from the hospitals on the per day basis rather than calculating on number of beds.

(iv) Aerial distance certificate from the nearby biomedical waste treatment facilities.

(v) Precautionary measures to be undertaken to avoid contamination of wastes or due to surface runoff from project site to the nearby water reservoir

(vi) Standard Operating Protocol starting from collection point of waste generation/raw material, segregation, transportation, treatment and disposal of waste generated from plant.

(vii) The baseline monitoring should also include biological parameters and baseline study should also cover the monsoon period.

(viii) The storage sheds provided for the biomedical waste should be covered.
(ix) Provide a buffer zone of 5km around the proposed site.
(x) A write up on the amount of segregated waste to be handled at the project site monthly and annually.
(xi) Avoid using transport route passing through the village.
(xii) SOP/measures to be followed for safety and health issues (due to handling of hazardous waste materials) of employees and local people of nearby villages.
(xiii) Area details to be cover for collection of waste materials/raw materials. xiv)Agreement papers or MoU with dealers for disposal of waste generated and its management.
(xiv) Category wise list of wastes to be handled.
(xv) Internal drainage plan of the project site for smooth discharge of excess rainwater along with excess treated water showing the location of its discharge point to the nearest public drain. The location of the nearest public drain also to be shown in the above-mentioned lay out map.

- The proposal was placed in the 190th meeting of SEIAA and was decided that after detailed deliberation, the authority decided to seek clarification / information on the following:

1. Scrutiny fees as applicable for the project.
2. It is observed that the existing operational CBWTF are more than 75 km away from the proposed CBWTF project. But ToR has been granted by SEIAA to M/s Renewable Envirogic Pvt. Ltd. for establishment of CBWTF at Industrial Estate Choudwar, District Cuttack. Hence, the PP is required to submit the distance between the proposed CBWTF site and that of M/s Renewable Envirogic Pvt. Ltd. CBWTF project site at Industrial Estate Choudwar, District Cuttack.

Now the PP has submitted the necessary clarification and scrutiny fees for consideration of Terms of Reference.

3. **Decision of Authority**: Approved :-The proposal was placed in the 192nd meeting of SEIAA held on 20.03.2025 for consideration of ToR. The authority deliberated on the submission of the PP and observed that since, there is no other facility which exists in Cuttack and in view of rapid urbanization and for better management of contagious biomedical waste in Cuttack District, the establishment of CBWTF at Choudwar Cuttack was previously approved. Further, the authority opined that transportation of Bio-medical waste is contagious and great risk when transported over long distances. After detailed deliberation, the authority approved the ToR with standard and specific conditions as recommended by SEAC for undertaking detailed EIA studies for establishment of CBWTF at Dhenkanal District.

Annexure-II

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

GRC INDIA TRAINING AND ANALYTICAL LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

F-375, SECTOR-63, NOIDA, GAUTAM BUDDHA NAGAR, UTTAR PRADESH, INDIA

in the field of

TESTING

Certificate Number: TC-7501

Issue Date: 26/04/2023 **Valid Until:** 25/04/2025

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : Grass Roots Research and Creation India (P) Limited

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

GRC INDIA TRAINING & ANALYTICAL LABORATORY
(A unit of Grass Roots Research & Creation India (P) Ltd.)
An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 (OH&S) Certified
NABL Accredited Laboratory (A Constituent Board of QCI) , TC 7501 (Chemical & Biological)
Recognized by Ministry of Environment, Forest & Climate Change (MoEF&CC, GOI) under the E(P) Act, 1986
Head Office: F-375, Sector-63, Noida, Gautam Budh Nagar, U.P. – 201301
Phone No.: 0120 – 4044630, 4044660; Fax: 0120 – 2406519, 0120 - 4044675
Website: https://www.grc-india.com; E-mail : lab@grc-india.com; info@grc-india.com

Test Report

Report Code: A20241101-011

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Project Site
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	65.9	34.6	4.7	11.2	160
2	07.10.2024	61.4	32.8	6.3	14.3	180
3	11.10.2024	63.8	33.4	6.1	14.1	150
4	14.10.2024	60.4	31.6	5.6	11.8	110
5	17.10.2024	65.5	34.1	4.8	14.8	150
6	21.10.2024	64.4	32.9	4.7	16.1	170
7	24.10.2024	59.6	30.8	4.9	15.3	130
8	27.10.2024	64.5	34.2	5.0	10.1	150

End of Report

Analyzed By (Chemist)

Narinder Singh (Sr. Chemist) Authorized Signatory (Seal & Signature)

Note:
1. The results indicated only refer to the tested samples and listed parameters and do not endorse any product.
2. This certificate shall not be reproduced wholly or in part without prior written consent of the GRC laboratory.
3. This certificate shall not be used in any advertising media or as evidence in the Court of Law without prior written consent of the GRC laboratory.
4. The MU will be reported in the test report only on the request of customer.
5. The samples received for chemical testing shall be destroyed after 30 days from the date of issue of the report unless specified otherwise and samples for biological testing will be destroyed after 7 days of issue of test report.

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Website: https://www.grc-india.com; E-mail : lab@grc-india.com; info@grc-india.com

Test Report

Report Code: A20241101-012

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Balrampur
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	65.7	33.6	5.1	11.3	240
2	07.10.2024	70.2	32.7	6.3	10.2	160
3	11.10.2024	71.9	35.2	5.4	11.7	290
4	14.10.2024	67.2	33.5	6.2	12.1	190
5	17.10.2024	58.4	28.0	6.4	11.3	150
6	21.10.2024	64.0	28.9	7.2	11.4	210
7	24.10.2024	61.1	27.4	5.4	10.8	180
8	27.10.2024	65.8	32.7	5.1	10.1	140

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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5. The samples received for chemical testing shall be destroyed after 30 days from the date of issue of the report unless specified otherwise and samples for biological testing will be destroyed after 7 days of issue of test report.

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TC-7501

Test Report

Report Code: A20241101-013

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Belamalia
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	60.8	29.8	6.3	11.6	330
2	07.10.2024	62.6	31.5	6.9	13.1	260
3	11.10.2024	63.2	30.7	6.6	15.3	250
4	14.10.2024	67.7	33.2	6.7	16.4	140
5	17.10.2024	60.5	29.9	7.3	13.3	180
6	21.10.2024	59.8	28.5	8.2	9.9	280
7	24.10.2024	61.6	30.2	7.7	15.2	330
8	27.10.2024	68.5	35.1	8.2	11.1	380

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: A20241101-014

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Karanda
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	64.5	30.8	6.1	12.0	270
2	07.10.2024	73.9	33.2	7.8	10.9	290
3	11.10.2024	71.7	30.8	7.1	12.4	180
4	14.10.2024	67.0	28.3	6.7	12.8	290
5	17.10.2024	63.2	29.6	5.9	12.0	260
6	21.10.2024	59.9	28.1	5.6	10.3	230
7	24.10.2024	65.0	33.4	5.3	10.1	140
8	27.10.2024	69.7	33.7	6.7	10.6	190

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241101-015

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Nihalprasad
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	58.9	29.2	7.6	11.5	300
2	07.10.2024	65.3	33.0	7.9	13.9	320
3	11.10.2024	58.6	28.5	7.1	13.6	380
4	14.10.2024	67.4	32.6	8.5	10.4	260
5	17.10.2024	57.9	28.5	7.4	10.8	300
6	21.10.2024	61.7	32.3	7.3	15.5	170
7	24.10.2024	63.9	34.1	6.1	12.9	390
8	27.10.2024	58.9	29.3	6.8	10.4	380

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241101-016

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Asand Bahali (Sensitive-Near Forest)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	61.5	30.5	5.5	13.7	310
2	07.10.2024	53.9	24.9	6.6	16.2	120
3	11.10.2024	60.3	28.7	5.8	10.3	230
4	14.10.2024	53.0	24.2	6.7	11.1	140
5	17.10.2024	62.3	28.3	7.5	16.0	300
6	21.10.2024	52.9	24.2	7.1	14.8	240
7	24.10.2024	56.7	28.0	6.0	9.8	170
8	27.10.2024	58.9	29.8	5.9	10.1	320

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241101-017

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Balikiari (Sensitive)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	57.8	29.7	5.6	9.9	340
2	07.10.2024	59.7	30.4	6.2	11.5	270
3	11.10.2024	62.4	30.3	5.9	13.7	260
4	14.10.2024	63.1	32.8	6.3	14.8	150
5	17.10.2024	67.0	28.7	6.6	11.7	190
6	21.10.2024	56.8	31.8	7.5	8.3	290
7	24.10.2024	64.0	30.5	7.0	13.6	340
8	27.10.2024	70.4	37.4	7.5	9.5	390

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: A20241101-018

Issue Date: 01.11.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 07.10.2024 to 31.10.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Bega (Habition)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/OCT/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	03.10.2024	67.6	31.8	6.3	15.6	310
2	07.10.2024	59.2	28.4	6.6	17.9	220
3	11.10.2024	61.4	27.9	5.8	13.4	360
4	14.10.2024	65.8	31.0	6.8	14.2	300
5	17.10.2024	65.7	30.9	6.2	15.1	370
6	21.10.2024	55.5	27.5	6.0	18.3	300
7	24.10.2024	61.6	29.9	5.1	16.4	330
8	27.10.2024	62.5	30.7	5.0	14.0	370

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241203-011

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Project Site
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	68.1	35.9	4.5	14.0	160
2	06.11.2024	66.4	34.2	5.1	14.5	260
3	09.11.2024	67.2	34.1	5.1	10.8	200
4	12.11.2024	65.4	35.5	5.5	9.6	230
5	15.11.2024	67.5	33.8	6.3	11.8	270
6	19.11.2024	68.6	35.6	5.3	10.1	230
7	23.11.2024	63.7	33.8	6.6	10.7	180
8	27.11.2024	58.3	30.1	5.9	13.6	210

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Website: https://www.grc-india.com; **E-mail** : lab@grc-india.com; info@grc-india.com

Test Report

Report Code: A20241203-012

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Balrampur
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	71.1	37.5	5.0	14.4	160
2	06.11.2024	69.4	36.1	6.0	16.1	260
3	09.11.2024	67.9	30.0	5.2	15.6	190
4	12.11.2024	73.7	35.8	6.6	13.3	220
5	15.11.2024	69.1	33.6	7.0	13.2	170
6	19.11.2024	56.6	26.1	5.6	15.5	210
7	23.11.2024	69.2	30.3	6.6	16.1	240
8	27.11.2024	66.0	31.1	5.5	14.0	170

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241203-013

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Belamalia
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	57.9	26.6	8.6	12.4	380
2	06.11.2024	67.6	33.2	8.2	16.6	280
3	09.11.2024	61.5	29.7	6.1	12.3	140
4	12.11.2024	68.3	34.4	7.3	11.1	210
5	15.11.2024	66.7	35.2	7.1	10.0	140
6	19.11.2024	67.6	34.1	6.5	11.9	220
7	23.11.2024	67.7	33.2	6.3	11.2	320
8	27.11.2024	62.4	30.9	6.5	10.0	150

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: A20241203-014

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Karanda
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	74.4	34.2	7.6	14.5	250
2	06.11.2024	75.0	30.2	6.2	14.9	210
3	09.11.2024	72.0	29.1	8.4	15.6	300
4	12.11.2024	70.5	34.6	5.9	16.7	240
5	15.11.2024	76.3	32.7	8.3	16.5	270
6	19.11.2024	74.1	27.8	7.3	14.7	310
7	23.11.2024	60.0	32.2	6.1	15.0	270
8	27.11.2024	74.6	31.7	7.2	15.6	220

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241203-015

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Nihalprasad
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	68.0	34.5	7.6	16.3	350
2	06.11.2024	74.5	39.1	6.3	14.1	390
3	09.11.2024	73.9	36.7	6.6	12.4	170
4	12.11.2024	74.2	37.6	7.4	15.3	380
5	15.11.2024	71.0	36.8	7.0	12.6	320
6	19.11.2024	73.4	37.6	7.9	11.4	350
7	23.11.2024	74.7	40.1	6.6	15.6	230
8	27.11.2024	69.5	36.6	7.5	9.9	260

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241203-016

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	(Asand Bahali (Sensitive-Near Forest))
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	64.6	31.2	6.7	16.0	290
2	06.11.2024	69.5	34.8	5.4	13.8	330
3	09.11.2024	68.9	32.4	5.7	9.5	110
4	12.11.2024	69.2	33.3	6.5	15.0	320
5	15.11.2024	66.0	32.5	6.1	12.3	260
6	19.11.2024	68.4	33.3	7.0	11.1	290
7	23.11.2024	69.7	35.8	5.7	15.3	170
8	27.11.2024	64.5	32.3	6.6	9.6	200

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241203-017

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	(Balikiari (Sensitive))
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	58.9	29.9	7.9	10.8	390
2	06.11.2024	67.9	35.5	7.5	15.2	290
3	09.11.2024	61.8	32.4	5.4	10.7	150
4	12.11.2024	68.6	36.7	6.6	9.5	220
5	15.11.2024	67.3	37.5	6.4	8.4	150
6	19.11.2024	67.9	36.4	5.8	10.3	230
7	23.11.2024	68.5	35.5	5.6	9.6	330
8	27.11.2024	62.7	33.2	5.8	8.4	160

End of Report

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20241203-018

Issue Date: 03.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.11.2024 to 02.12.2024

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Bega (Habition)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/NOV/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.11.2024	71.0	34.6	5.7	15.4	260
2	06.11.2024	70.0	34.8	4.3	15.8	220
3	09.11.2024	67.0	30.8	6.5	16.5	310
4	12.11.2024	65.5	29.7	4.0	17.6	250
5	15.11.2024	71.3	35.5	6.4	17.4	280
6	19.11.2024	69.1	33.3	5.4	15.6	320
7	23.11.2024	55.0	27.6	4.2	15.9	280
8	27.11.2024	69.6	32.8	5.3	16.5	230

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: A20250103-011 **Issue Date: 03.01.2025**

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Project Site
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	60.2	32.2	6.2	11.4	120
2	06.12.2024	53.5	27.8	5.4	9.9	250
3	10.12.2024	60.2	30.4	6.4	16.4	260
4	13.12.2024	55.5	28.1	5.8	11.8	240
5	17.12.2024	57.6	30.3	5.6	14.5	190
6	20.12.2024	53.4	28.1	4.8	11.1	240
7	24.12.2024	62.5	33.7	4.7	10.9	180
8	28.12.2024	54.7	27.9	4.6	10.4	280

****End of Report****

Analyzed By (Chemist)

Narinder Singh (Sr. Chemist) Authorized Signatory (Seal & Signature)

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5. The samples received for chemical testing shall be destroyed after 30 days from the date of issue of the report unless specified otherwise and samples for biological testing will be destroyed after 7 days of issue of test report.

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Website: https://www.grc-india.com; **E-mail** : lab@grc-india.com; info@grc-india.com

TC-7501

Test Report

Report Code: A20250103-012

Issue Date: 03.01.2025

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village (Balrampur)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	57.3	26.1	5.2	17.3	180
2	06.12.2024	59.5	24.8	5.8	12.1	270
3	10.12.2024	65.9	28.7	6.3	15.5	140
4	13.12.2024	63.8	28.6	6.1	15.9	180
5	17.12.2024	56.6	25.2	6.6	11.7	220
6	20.12.2024	59.7	24.5	5.1	15.1	170
7	24.12.2024	57.2	26.7	5.8	12.7	160
8	28.12.2024	66.6	31.4	5.5	13.4	180

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20250103-013

Issue Date: 03.01.2025

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Belamalia
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	60.3	29.2	6.5	16.5	200
2	06.12.2024	57.5	27.6	6.4	13.9	280
3	10.12.2024	54.4	28.4	6.7	10.1	320
4	13.12.2024	53.1	27.8	6.5	12.4	170
5	17.12.2024	59.8	29.6	7.6	15.0	320
6	20.12.2024	66.7	32.2	7.1	11.0	180
7	24.12.2024	56.5	27.8	7.7	14.6	370
8	28.12.2024	63.7	31.2	6.5	10.0	280

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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5. The samples received for chemical testing shall be destroyed after 30 days from the date of issue of the report unless specified otherwise and samples for biological testing will be destroyed after 7 days of issue of test report.

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Test Report

Report Code: A20250103-014

Issue Date: 03.01.2025

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Karanda
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	72.6	27.8	8.2	14.7	300
2	06.12.2024	64.2	27.3	8.5	17.0	210
3	10.12.2024	66.4	30.4	7.7	12.5	350
4	13.12.2024	70.8	30.3	8.6	13.3	290
5	17.12.2024	70.7	26.9	8.1	14.2	360
6	20.12.2024	60.5	28.2	7.9	17.4	290
7	24.12.2024	66.6	30.1	7.6	15.5	320
8	28.12.2024	67.5	30.6	6.9	13.1	360

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20250103-015

Issue Date: 03.01.2025

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Village Nihalprasad
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	68.5	35.7	7.5	16.5	180
2	06.12.2024	66.0	32.5	6.7	10.6	290
3	10.12.2024	68.4	34.0	7.6	11.4	200
4	13.12.2024	71.0	36.7	8.4	16.3	360
5	17.12.2024	68.1	35.2	8.0	15.1	300
6	20.12.2024	69.0	36.0	6.9	10.1	230
7	24.12.2024	58.9	29.3	6.8	10.4	380
8	28.12.2024	63.9	34.1	6.4	12.9	340

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: A20250103-016

Issue Date: 03.01.2025

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS

(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Asand Bahali (Sensitive-Near Forest)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	61.2	29.8	6.4	12.2	330
2	06.12.2024	61.5	29.5	6.7	9.1	240
3	10.12.2024	65.1	33.4	7.0	13.6	260
4	13.12.2024	62.6	29.2	6.2	13.3	320
5	17.12.2024	65.0	30.7	7.1	10.1	200
6	20.12.2024	67.6	33.4	6.5	10.5	240
7	24.12.2024	64.7	33.9	6.4	15.2	190
8	28.12.2024	65.6	32.7	5.5	12.6	330

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20250103-017

Issue Date: 03.01.2025

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Balikiari (Sensitive)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	60.6	31.5	5.8	14.9	210
2	06.12.2024	59.7	28.9	5.7	12.3	290
3	10.12.2024	68.5	29.7	6.0	8.5	330
4	13.12.2024	67.1	30.1	5.8	10.8	180
5	17.12.2024	69.6	31.9	6.9	13.4	330
6	20.12.2024	62.4	34.5	6.4	9.4	190
7	24.12.2024	60.9	30.1	7.0	13.0	380
8	28.12.2024	63.5	31.5	5.8	8.4	290

****End of Report****

Analyzed By (Chemist)

Narinder Singh (Sr. Chemist)
Authorized Signatory (Seal & Signature)

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Test Report

Report Code: A20250103-018

Issue Date: 03.01.2025

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Analysis Duration: 05.12.2024 to 02.01.2025

Sample Description: Ambient Air

RESULTS
(Ambient Air Quality Analysis)

SAMPLING DETAILS

Sampling Location	:	Bega (Habition)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/AIR/01: 2018
Weather Condition	:	Clear Sky
Sampling Duration	:	24 Hours
Sampling Duration for CO	:	1 Hour
Sampler Installation Height	:	4.0 Meter above Ground Level
Sample Packing & Marking	:	Plastic Bottle/ Zip Polybag & MKD/DEC/A001-A008

S. No.	Date	Test Parameters				
		Particulate Matter (PM_{10}); µg/m³	Particulate Matter ($PM_{2.5}$); µg/m³	Sulphur Dioxide (SO_2); µg/m³	Nitrogen Dioxide (NO_2); µg/m³	Carbon Monoxide (CO); µg/m³
		IS 5182 (Part 23): 2006 (RA 2022)	IS 5182 (Part 24): 2019 (RA 2024)	IS 5182 (Part 2): 2001 (RA 2022)	IS 5182 (Part 6): 2006 (RA 2022)	IS 5182 (Part 10): 1999 (RA 2019)
National Ambient Air Quality Standards (2009) - 24 Hours ** Except CO		**100**	**60**	**80**	**80**	**4000**
1	02.12.2024	68.1	32.4	6.3	15.6	310
2	06.12.2024	70.5	33.6	6.6	17.9	220
3	10.12.2024	68.3	34.8	5.8	13.4	360
4	13.12.2024	63.6	32.4	6.8	14.2	300
5	17.12.2024	59.8	29.9	6.2	15.1	370
6	20.12.2024	56.5	31.2	6.0	18.3	300
7	24.12.2024	61.6	29.7	5.1	16.4	330
8	28.12.2024	66.3	35.0	5.0	14.0	370

****End of Report****

Analyzed By
(Chemist)

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: N20241211-011

Issue Date: 11.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Monitoring Data Received On: 09.12.2024

Sample Description: Ambient Noise

RESULTS

(Ambient Noise Monitoring Data)

SAMPLING DETAILS

Date of Monitoring	:	07.12.2024
Monitoring Done by	:	Mr. Maan Singh
Monitoring Protocol	:	IS 9989: 1981, RA 2023
Weather Condition	:	Clear Sky
Monitoring Duration	:	24 Hours

S. No.	Location	Zone	Prescribed Limit {Noise Pollution (Regulation & Control) Rules, 2000}; Leq, dB (A)		Observed Value; Leq, dB (A)	
			Day Time*	Night Time**	Day Time*	Night Time**
1	Project Site	Industrial Area	75	70	40.7	36.5
2	Balrampur	Residential Area	55	45	43.8	38.7
3	Belamalia	Residential Area	55	45	42.3	39.6
4	Karanda	Residential Area	55	45	40.3	38.5
5	Nihalprasad	Residential Area	55	45	52.7	43.6
6	Asand Bahali (Sensitive-Near Forest)	Residential Area	55	45	40.5	36.8
7	Balikiari (Sensitive)	Residential Area	55	45	42.8	38.7
8	Bega (Habition)	Residential Area	55	45	50.6	39.8

* Day Time	6.00 AM to 10.00 PM
**Night Time	10.00 PM to 6.00 AM

****End of Report****

Narinder Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-011(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Near Project site
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-01

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	6.97	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	267	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	170	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	153	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	46	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.05	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	41	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	16	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	10.6	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	5.4	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.41	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-011(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	8.6	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.2	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	400	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241213-011(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Near Project site
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-01

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-012(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Balrampur
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-02

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	7.87	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	445	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	248	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	203	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	67	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.53	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	60	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	24	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	63	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	5.3	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.63	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-012(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	5.4	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.4	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	667	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241213-012(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Balrampur
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-02

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: GW20241224-013(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Belamalia
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-03

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	7.33	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	319	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	176	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	160	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	73	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.33	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	42	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	17	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	8.7	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	5.5	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.45	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-013(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	6.3	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.1	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	478	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: GW20241213-013(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS

(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Belamalia
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-03

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-014(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Karanda
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-04

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	7.59	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	157	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	97	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	74	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	33	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.07	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	23	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	9	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	10.9	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	5.8	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.35	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-014(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	4.7	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.06	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	236	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: GW20241213-014(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Karanda
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-04

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-015(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Nihalprasad
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-05

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	7.54	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	306	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	193	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	146	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	76	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.21	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	46	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	19	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	6.9	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	4.4	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.63	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-015(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	7.6	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.07	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	458	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 (OH&S) Certified
NABL Accredited Laboratory (A Constituent Board of QCI) , TC 7501 (Chemical & Biological)
Recognized by Ministry of Environment, Forest & Climate Change (MoEF&CC, GOI) under the E(P) Act, 1986
Head Office: F-375, Sector-63, Noida, Gautam Budh Nagar, U.P. – 201301
Phone No.: 0120 – 4044630, 4044660; **Fax:** 0120 – 2406519, 0120 - 4044675
Website: https://www.grc-india.com; **E-mail :** lab@grc-india.com; info@grc-india.com

TC-7501

Test Report

Report Code: GW20241213-015(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS

(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Nihalprasad
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-05

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-016(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Asand Bahali (Sensitive-Near Forest)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-06

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	7.09	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	181	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	128	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	110	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	28	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.22	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	31	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	12	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	6.7	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	5.3	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.51	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-016(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	8.3	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.05	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	272	IS 3025 (Part-14): 2013, RA 2022

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241213-016(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024

Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Asand Bahali (Sensitive-Near Forest)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-06

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-017(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Balikiari (Sensitive)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-07

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	7.89	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	374	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	187	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	170	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	94	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.03	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	45	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	18	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	12.8	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	4.9	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.67	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-017(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	5.6	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.2	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	560	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241213-017(B)

Issue Date: 13.12.2024

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Sample Description: Ground Water

Sample Received On: 09.12.2024

Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Balikiari (Sensitive)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-07

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: GW20241224-018(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Bega (Habition)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-1): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/GW-08

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2023)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS 3025 (Part-4): 2021
2	Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (Part-5): 2018
3	Turbidity	NTU	1	5	<1	IS 3025 (Part-10): 2023
4	pH Value	-	6.5-8.5	No Relaxation	7.58	IS 3025 (Part-11): 2022
5	Total Dissolved Solids	mg/l	500	2000	255	IS 3025 (Part-16): 2023
6	Total Hardness (as CaCO3)	mg/l	200	600	109	IS 3025 (Part-21): 2009, RA 2023
7	Total Alkalinity (as CaCO3)	mg/l	200	600	153	IS 3025 (Part-23): 2023
8	Chlorides (as Cl)	mg/l	250	1000	45	IS 3025 (Part-32): 1988, RA 2019
9	Fluoride (as F)	mg/l	1	1.5	0.09	APHA 24th Ed., 4500F-D: 2024
10	Calcium (as Ca2+)	mg/l	75	200	40	IS 3025 (Part-40): 2024
11	Magnesium (as Mg2+)	mg/l	30	100	16	IS 3025 (Part-46): 2023
12	Sulphate (as SO4)	mg/l	200	400	4.6	IS 3025 (Part-24/Sec-1): 2022
13	Nitrate (as NO3)	mg/l	45	No Relaxation	4.7	IS 3025 (Part-34/Sec-1): 2023
14	Iron (as Fe)	mg/l	0.3	No Relaxation	0.56	3120-B, APHA 24th Ed. 2024 (ICP-OES)

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241224-018(A) **Issue Date: 24.12.2024**

15	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
16	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
17	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
18	Boron (as B)	mg/l	0.5	1	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
19	Zinc (as Zn)	mg/l	5	15	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
22	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
23	Total Chromium (as Cr3+)	mg/l	0.05	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	IS 3025 (Part-27/Sec-1): 2021
25	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
27	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	IS 3025 (Part-43/Sec-1): 2022
29	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	IS 3025 (Part-68): 2019
30	Silica (as SiO2)	mg/l	--	--	5.9	APHA 24th Ed., 4500-SiO2 (C/D): 2023
31	Phosphate (as PO4)	mg/l	--	--	0.3	APHA 24th Ed., 4500-P D: 2023
32	Specific Conductivity	µS/cm	--	--	382	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: GW20241213-018(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Ground Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Borewell Bega (Habition)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/GW-08

S. No.	Parameters	Units	Requirements (as per IS 10500: 2012, RA 2018)	Results	Test Method
1	Total Coliform	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Not Detected)	IS 1622: 1981, RA 2019
2	E. coli	MPN/100ml	Shall not be detected in 100 ml Sample	<2 (Absent)	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: SW20241224-011(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Surface Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS

(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Brahmani River Upstream
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-6): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/SW-01

S. No.	Parameters	Units	Results	Test Method
1.	Color	Hazen	<5	IS 3025 (Part-4): 2021
2.	Turbidity	NTU	10	IS 3025 (Part-10): 2023
3.	Temperature	^0C	19.3	IS 3025 (Part-9): 2023
4.	pH Value	-	7.63	IS 3025 (Part-11): 2022
5.	Dissolved Oxygen (as O_2)	mg/l	6.5	IS 3025 (Part-38): 1989, RA 2019
6.	Biochemical Oxygen Demand (BOD) 3 Days at 27^0C	mg/l	2.4	IS 3025 (Part-44): 2023
7.	Chemical Oxygen Demand (COD)	mg/l	10	IS 3025 (Part-58): 2023
8.	Total Dissolved Solids (TDS)	mg/l	200	IS 3025 (Part-16): 2023
9.	Total Hardness (as $CaCO_3$)	mg/l	123	IS 3025 (Part-21): 2009, RA 2023
10.	Total Alkalinity (as $CaCO_3$)	mg/l	93	IS 3025 (Part-23): 2023
11.	Chlorides (as Cl)	mg/l	37	IS 3025 (Part-32): 1988, RA 2019
12.	Fluoride (as F)	mg/l	0.53	APHA 24th Ed., 4500F-D: 2023
13.	Calcium (as Ca^{2+})	mg/l	30	IS 3025 (Part-40): 2024
14.	Magnesium (as Mg^{2+})	mg/l	12	IS 3025 (Part-46): 2023
15.	Sodium (as Na^+)	mg/l	19	IS 3025 (Part-45): 1993, RA 2019
16.	Potassium (as K^+)	mg/l	2.2	IS 3025 (Part-45): 1993, RA 2019
17.	Sulphate (as SO_4)	mg/l	18	IS 3025 (Part-24/Sec-1): 2022

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: SW20241224-011(A) **Issue Date: 24.12.2024**

18.	Total Kjeldahl Nitrogen (as N)	mg/l	1.1	IS 3025 (Part-34/Sec-1): 2023
19.	Free Ammonia (as NH_3)	mg/l	0.05	IS 3025 (Part-34/Sec-1): 2023
20.	Nitrate (as NO_3)	mg/l	0.9	IS 3025 (Part-34/Sec-1): 2023
21.	Silica (as SiO_2)	mg/l	10	APHA 24th Ed., 4500-SiO_2 (C/D): 2023
22.	Phosphate (as PO_4)	mg/l	0.3	APHA 24th Ed., 4500-P D: 2023
23.	Iron (as Fe)	mg/l	0.32	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24.	Aluminum (as Al)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
25.	Boron (as B)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26.	Copper (as Cu)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
27.	Manganese (as Mn)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28.	Zinc (as Zn)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
29.	Selenium (as Se)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
30.	Arsenic (as As)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
31.	Cadmium (as Cd)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
32.	Total Chromium (as Cr^{3+})	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
33.	Cyanide (as CN)	mg/l	<0.01	IS 3025 (Part-27)/Sec-1): 2021
34.	Lead (as Pb)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
35.	Mercury (as Hg)	mg/l	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
36.	Nickel (as Ni)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
37.	Total Suspended Solids	mg/l	16	IS 3025 (Part-17): 2022
38.	Sodium Adsorption Ratio	meq/l	0.7	Sec. 5.1.3, IS 11624: 2019
39.	Phenolic Compounds (as C_6H_5OH)	mg/l	<0.001	IS 3025 (Part-43/Sec-1): 2022
40.	Anionic Detergent (as MBAS)	mg/l	<0.01	IS 3025 (Part-68): 2019
41.	Specific Conductivity	µS/cm	300	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: SW20241213-011(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Surface Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS

(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Brahmani River Upstream
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/SW-01

S. No.	Parameters	Units	Results	Test Method
1.	Total Coliform Organism	MPN/100ml	240	IS 1622: 1981, RA 2019
2.	Faecal Coliform Organism	MPN/100ml	80	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: SW20241224-012(A)

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Surface Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS

(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Brahmani River Downstream
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-6): 2021
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Liter
Sample Packing & Marking	:	Plastic Bottle & MKD/DEC/SW-02

S. No.	Parameters	Units	Results	Test Method
1.	Color	Hazen	<5	IS 3025 (Part-4): 2021
2.	Turbidity	NTU	12	IS 3025 (Part-10): 2023
3.	Temperature	^{0}C	19.5	IS 3025 (Part-9): 2023
4.	pH Value	-	7.57	IS 3025 (Part-11): 2022
5.	Dissolved Oxygen (as O_2)	mg/l	6.3	IS 3025 (Part-38): 1989, RA 2019
6.	Biochemical Oxygen Demand (BOD) 3 Days at 27^{0}C	mg/l	2.8	IS 3025 (Part-44): 2023
7.	Chemical Oxygen Demand (COD)	mg/l	12	IS 3025 (Part-58): 2023
8.	Total Dissolved Solids (TDS)	mg/l	210	IS 3025 (Part-16): 2023
9.	Total Hardness (as $CaCO_3$)	mg/l	131	IS 3025 (Part-21): 2009, RA 2023
10.	Total Alkalinity (as $CaCO_3$)	mg/l	101	IS 3025 (Part-23): 2023
11.	Chlorides (as Cl)	mg/l	38	IS 3025 (Part-32): 1988, RA 2019
12.	Fluoride (as F)	mg/l	0.56	APHA 24th Ed., 4500F-D: 2023
13.	Calcium (as Ca^{2+})	mg/l	31	IS 3025 (Part-40): 2024
14.	Magnesium (as Mg^{2+})	mg/l	13	IS 3025 (Part-46): 2023
15.	Sodium (as Na^+)	mg/l	21	IS 3025 (Part-45): 1993, RA 2019
16.	Potassium (as K^+)	mg/l	2.5	IS 3025 (Part-45): 1993, RA 2019
17.	Sulphate (as SO_4)	mg/l	20	IS 3025 (Part-24/Sec-1): 2022

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: SW20241224-012(A) **Issue Date: 24.12.2024**

18.	Total Kjeldahl Nitrogen (as N)	mg/l	1.2	IS 3025 (Part-34/Sec-1): 2023
19.	Free Ammonia (as NH_3)	mg/l	0.06	IS 3025 (Part-34/Sec-1): 2023
20.	Nitrate (as NO_3)	mg/l	1.1	IS 3025 (Part-34/Sec-1): 2023
21.	Silica (as SiO_2)	mg/l	9	APHA 24th Ed., 4500-SiO_2 (C/D): 2023
22.	Phosphate (as PO_4)	mg/l	0.5	APHA 24th Ed., 4500-P D: 2023
23.	Iron (as Fe)	mg/l	0.33	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
24.	Aluminum (as Al)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
25.	Boron (as B)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
26.	Copper (as Cu)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
27.	Manganese (as Mn)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
28.	Zinc (as Zn)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
29.	Selenium (as Se)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
30.	Arsenic (as As)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
31.	Cadmium (as Cd)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
32.	Total Chromium (as Cr^{3+})	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
33.	Cyanide (as CN)	mg/l	<0.01	IS 3025 (Part-27)/Sec-1): 2021
34.	Lead (as Pb)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
35.	Mercury (as Hg)	mg/l	<0.001	APHA 24th Ed., 3120-B: 2023 (ICP-OES-VGA)
36.	Nickel (as Ni)	mg/l	<0.01	APHA 24th Ed., 3120-B: 2023 (ICP-OES)
37.	Total Suspended Solids	mg/l	19	IS 3025 (Part-17): 2022
38.	Sodium Adsorption Ratio	meq/l	0.8	Sec. 5.1.3, IS 11624: 2019
39.	Phenolic Compounds (as C_6H_5OH)	mg/l	<0.001	IS 3025 (Part-43/Sec-1): 2022
40.	Anionic Detergent (as MBAS)	mg/l	<0.01	IS 3025 (Part-68): 2019
41.	Specific Conductivity	µS/cm	320	IS 3025 (Part-14): 2013, RA 2023

End of Report

Analyzed By
(Chemist)

Rahul Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: SW20241213-012(B)

Issue Date: 13.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Surface Water

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 12.12.2024

RESULTS
(Water Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Brahmani River Downstream
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	IS 17614 (Part-25): 2022
Weather Condition	:	Clear Sky
Sample Quantity	:	0.5 Liter
Sample Packing & Marking	:	Sterile Glass Bottle & MKD/DEC/SW-02

S. No.	Parameters	Units	Results	Test Method
1.	Total Coliform Organism	MPN/100ml	290	IS 1622: 1981, RA 2019
2.	Faecal Coliform Organism	MPN/100ml	110	IS 1622: 1981, RA 2019

****End of Report****

Analyzed By
(Microbiologist)

Ajay Kumar Sharma
(Sr. Quality Manager)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: S20241224-011

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Project Site
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-01

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	45.8	
	Silt	%	15.5	
	Clay	%	38.7	
3.	pH (1:2 Suspension)	-	7.83	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	183	IS 14767: 2000, RA 2021
5.	Moisture Content	%	10.9	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	14.3	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	43	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	157	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	1971	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	442	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.83	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

Narender Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: S20241224-011

Issue Date: 24.12.2024

12.	Organic Matter	%	0.89	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	40	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	13.2	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	6.9	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	8.1	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	4.6	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	2.3	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	0.2	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	26	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	30.3	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27°C	cm/sec	2.1	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	26.7	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.41	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: S20241224-012

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Balrampur
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-02

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	47.6	
	Silt	%	16.7	
	Clay	%	35.7	
3.	pH (1:2 Suspension)	-	6.83	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	179	IS 14767: 2000, RA 2021
5.	Moisture Content	%	9.7	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	14.3	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	47	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	148	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	1980	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	436	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.78	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

GRC-LAB/QF-039 Rev.:00 Issue Date: 02.07.2018

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Test Report

Report Code: S20241224-012

Issue Date: 24.12.2024

12.	Organic Matter	%	0.81	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	43	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	12.4	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	5.3	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	6.3	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	3.8	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	3.1	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	0.5	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	25	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	29.8	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27°C	cm/sec	2.1	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	27.3	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.43	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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TC-7501

Test Report

Report Code: S20241224-013

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Belamalia
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-03

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	44.8	
	Silt	%	18.3	
	Clay	%	36.9	
3.	pH (1:2 Suspension)	-	6.99	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	193	IS 14767: 2000, RA 2021
5.	Moisture Content	%	10.6	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	14.4	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	44	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	152	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	1983	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	451	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.80	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

GRC-LAB/QF-039 Rev.:00 Issue Date: 02.07.2018

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Test Report

Report Code: S20241224-013

Issue Date: 24.12.2024

12.	Organic Matter	%	0.93	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	41	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	9.8	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	6.4	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	6.5	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	4.6	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	2.4	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	0.3	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	30	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	33.5	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27°C	cm/sec	1.9	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	26.8	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.44	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
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TC-7501

Test Report

Report Code: S20241224-014

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Karanda
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-04

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	43.6	
	Silt	%	16.8	
	Clay	%	39.6	
3.	pH (1:2 Suspension)	-	7.16	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	187	IS 14767: 2000, RA 2021
5.	Moisture Content	%	11.7	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	14.7	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	48	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	143	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	1996	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	478	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.74	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: S20241224-014

Issue Date: 24.12.2024

12.	Organic Matter	%	0.9	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	39	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	11.9	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	6.3	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	7	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	4.1	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	2	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	0.4	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	33	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	33.8	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27°C	cm/sec	1.9	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	27.4	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.45	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Website: https://www.grc-india.com; E-mail : lab@grc-india.com; info@grc-india.com

Test Report

Report Code: S20241224-015

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Nihalprasad
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-05

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	48.7	
	Silt	%	17.5	
	Clay	%	33.8	
3.	pH (1:2 Suspension)	-	7.45	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	175	IS 14767: 2000, RA 2021
5.	Moisture Content	%	8.9	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	14.3	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	53	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	144	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	1982	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	430	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.76	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

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(Sr. Chemist)
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(Seal & Signature)

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Test Report

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12.	Organic Matter	%	0.86	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	38	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	13.8	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	7.1	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	11.2	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	3.5	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	3.2	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	0.7	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	27	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	32.7	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27°C	cm/sec	2.1	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	28.9	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.43	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

Analyzed By
(Chemist)

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TC-7501

Test Report

Report Code: S20241224-016

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Asand Bahali (Sensitive-Near Forest)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-06

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	49.2	
	Silt	%	14.3	
	Clay	%	36.5	
3.	pH (1:2 Suspension)	-	7.49	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	221	IS 14767: 2000, RA 2021
5.	Moisture Content	%	11.8	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	14.7	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	57	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	122	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	2084	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	431	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.63	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: S20241224-016

Issue Date: 24.12.2024

12.	Organic Matter	%	0.87	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	44	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	15.2	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	7.8	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	8.4	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	2.6	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	2.4	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	0.85	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	8.6	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	30.9	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27^{0}C	cm/sec	2.1	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	28.6	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.38	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

Analyzed By
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TC-7501

Test Report

Report Code: S20241224-017

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Balikiari (Sensitive)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-07

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	46.7	
	Silt	%	14.7	
	Clay	%	38.6	
3.	pH (1:2 Suspension)	-	6.89	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	197	IS 14767: 2000, RA 2021
5.	Moisture Content	%	10.3	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	16.6	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	63	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	140	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	2347	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	487	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.68	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: S20241224-017

Issue Date: 24.12.2024

12.	Organic Matter	%	0.93	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	42	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	16.4	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	7.9	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	6.3	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	2.8	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	2.3	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	1.6	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	23.7	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	30.4	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27°C	cm/sec	2.2	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	34.6	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.36	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

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TC-7501

Test Report

Report Code: S20241224-018

Issue Date: 24.12.2024

Issued To: Common Bio medical Waste Treatment facility (CBWTF) By M/s MKD ECO Clean Pvt. Ltd., Gadai, District- Dhenkanal, Odisha.

Sample Description: Soil Sample

Sample Received On: 09.12.2024
Analysis Duration: 09.12.2024 to 23.12.2024

RESULTS
(Soil Quality Analysis)

SAMPLING DETAILS

Date of Sampling	:	07.12.2024
Sampling Location	:	Bega (Habition)
Sample Collected by	:	Mr. Maan Singh
Sampling Protocol	:	GRC/LAB/STP/01: 2018
Weather Condition	:	Clear Sky
Sample Quantity	:	5 Kg (Composite sample)
Sample Packing & Marking	:	Zip Polybag & MKD/DEC/SQ-08

S. No.	Parameters	Units	Results	Test Method
1.	Texture	-	Sandy Clay Loam	GRC-LAB/STP-SOIL/22; 2018
2.	Particle Size Distribution	-	--	IS 2720 (Part-4): 1985, RA 2020
	Sand	%	49.3	
	Silt	%	13.2	
	Clay	%	37.5	
3.	pH (1:2 Suspension)	-	6.78	IS 2720 (Part-26): 1987, RA 2021
4.	Electrical Conductivity (1:2 Suspension)	µS/cm	171	IS 14767: 2000, RA 2021
5.	Moisture Content	%	9.1	IS 2720 (Part-2): 1973, RA 2020
6.	Cation Exchange Capacity (CEC)	meq/100gm	14.6	IS 2720 (Part-24): 1976, RA 2020
7.	Available Potassium (as K)	mg/kg	54	GRC-LAB/STP-SOIL/07; 2018
8.	Exchangeable Sodium (as Na)	mg/kg	139	GRC-LAB/STP-SOIL/06; 2018
9.	Exchangeable Calcium (as Ca)	mg/kg	1987	GRC-LAB/STP-SOIL/08; 2018
10.	Exchangeable Magnesium (as Mg)	mg/kg	470	GRC-LAB/STP-SOIL/08; 2018
11.	Sodium Absorption Ratio (SAR)	meq/kg	0.73	GRC-LAB/STP-SOIL/19; 2018

Analyzed By
(Chemist)

Narendra Singh
(Sr. Chemist)
Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: S20241224-018

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12.	Organic Matter	%	0.92	IS 2720 (Part-22): 1972, RA 2020
13.	Total Nitrogen (as N)	mg/kg	45	IS 14684: 1999, RA 2019
14.	Nitrate (as NO_3)	mg/kg	13.7	IS 14684: 1999, RA 2019
15.	Total Phosphate (as PO_4)	mg/kg	6.8	USEPA Method 365.3: 1978
16.	Iron (as Fe)	mg/kg	6.9	USEPA Method 3051-A (Rev.-01): 2007
17.	Zinc (as Zn)	mg/kg	2.3	USEPA Method 3051-A (Rev.-01): 2007
18.	Copper (as Cu)	mg/kg	2.0	USEPA Method 3051-A (Rev.-01): 2007
19.	Boron (as B)	mg/kg	1.3	USEPA Method 3051-A (Rev.-01): 2007
20.	Manganese (as Mn)	mg/kg	9.6	USEPA Method 3051-A (Rev.-01): 2007
21.	Water Holding Capacity	%	25.9	GRC-LAB/STP-SOIL/13; 2020
22.	Permeability at 27°C	cm/sec	2.4	IS 2720 (Part-17): 1986, RA 2021
23.	Porosity	%	39.8	GRC-LAB/STP-SOIL/20; 2020
24.	Bulk Density	gm/cm^3	1.38	GRC-LAB/STP-SOIL/12; 2018

****End of Report****

Analyzed By
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5. The samples received for chemical testing shall be destroyed after 30 days from the date of issue of the report unless specified otherwise and samples for biological testing will be destroyed after 7 days of issue of test report.

MKD ECO CLEAN PRIVATE LTD

CIN No: U32509OD2023PTC044035
Plot no 143/3933, IIIB Colony Po-Sisupalgarh, Bhubaneswar -751002
Ph-0674-3161342, M-6370094363 Email mkdecoclean@gmail.com

Annexure-IV

Date: 18.03.2025

To,
The Principal Chief Conservator of Forests (PCCF)
Forest and Environment Department
Government of India, Lok Seva Bhawan
Bhubaneswar-751001

Subject: Wildlife Conservation plan approval w.r.t. Common Bio-Medical Waste Treatment Facility Project at Plot no. 553/1081, 555, 556, 557, 559, 56 0, 561, 562, 563, 565,566,567, Tehsil/Thana-Gadal District - Dhenkanal, Odisha by M/s MKD Eco Clean Private Limited

Dear Sir,

We would like to inform you that we are in process of obtaining environment clearance for the project cited above. During the Ecology and Biodiversity study of the 10 km buffer zone of project site we have identified Schedule-I species like Indian chameleon, Common Rat Snake, Common Indian Krait*, Bengal monitor, Russell's Viper, Indian Cobra, Brown Fish owl, Screech owl (Barn owl), Pariah kite (Black kite) and Small Fox. We have prepared the Conservation plan for the same alongwith budget of INR 10 Lakhs and the Conservation plan is attached for approval.

We request you; kindly accept our application and approve the conservation plan.

Thanking you.

M/s MKD Eco Clean Private Limited
MKD ECO CLEAN PVT. LTD.
Lipsit Dash
Name: Lipsit Dash
DIRECTOR
Designation: Director

PRINCIPAL CHIEF CONSERVATOR OF FORESTS
ODISHA, BHUBANESWAR
25 MAR 2025
Received No.
Sec. 25.03.25

Wildlife Conservation Plan for Schedule-I Species Recorded in the Buffer Zone (10 Km Radius)

w.r.t.

Common Bio-Medical Waste Treatment Facility

Located at

Plot no. 553/1081, 555, 556, 557, 559, 56 0, 561, 562, 563, 565,566,567, Tehsil/Thana-Gondia District - Dhenkanal, Odisha

Project Proponent:

M/s MKD Eco Clean Private Limited

Plot no. 143/3933, IHB Colony PO- Sisupalgarh, Bhubaneswar-751002

1.0 Introduction

M/s MKD Eco Clean Private Limited is a private company which was incorporated on 18th October, 2023. The company has its registered office at Plot No, 143/3933, IHB Colony Po-sisupalgarh, Old Town, Khorda, Lingaraj, Orissa, India, 751002. The Corporate Identification Number (CIN) of the company is U32509OD2023PTC044035. The Director of the company is Mr. Lipshit Dash.

Wildlife Conservation in Odisha

The state of Odisha has a geographical area of 1,55,707 sq. km. The recorded forest area is 58,136 sqkm as per the State of Forest Report (SFR-2015) of Forest Survey of India. The state is quite rich in wildlife. The important wildlife found in state are Elephants, Tigers, Leopards, Hyena, Jungle cats, Sambar, Spotted deer, wild Boar, Giants squirrels, Peafowl, Hill myna, Marsh Crocodile, Gharial, Salt water Crocodile, King Cobra, Sea Turtles and Monitor Lizard etc. To provide protection to wildlife and their habitat, a network of protected areas have been constituted. Special programs have been initiated for special care of endangered and threatened species.

The State has 19 Sanctuaries including Gahirmatha Marine Wildlife Sanctuary, one National Park (Bhitarkanika), one proposed National Park (Similipal) which has been notified under the provisions of Indian Wildlife (Protection) Act, 1972 for in-situ conservation. These Protected Areas constitute 10.37% of the total forest area and 5.36% of the total geographical area of the State. One large Zoological Park (Nandankanan), three Small Zoos and seven Mini Zoos have been notified for ex-situ conservation and management of wildlife outside protected areas. The State has the singula distinction of having three stretches of mass nesting beaches of endangered Olive Ridley Sea turtles including the world's largest nesting ground if Olive Ridley Sea turtle, Lepido chelysolivacea at Gahirmatha. It has many natural wetlands including the largest wetland of Asia (Chilika) and Bhitarkanika which are declared as "Ramsar Sites". Six Eco-sensitive Zones finally notified (Kapilash, Chandaka, Balukhanda, Debrigarh, Kuldiha and Bhitarkanika).

Brief Description of the Study Area

The proposed site has good connectivity with the rail and road.

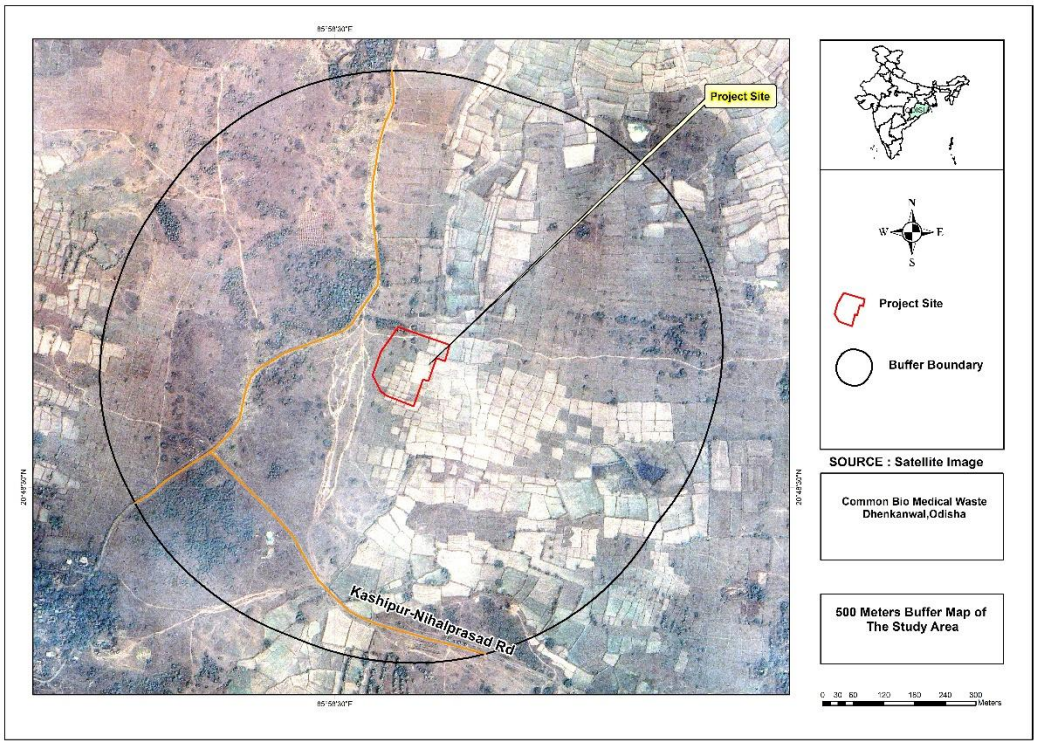

Figure 1: 500 Meter Radius Map

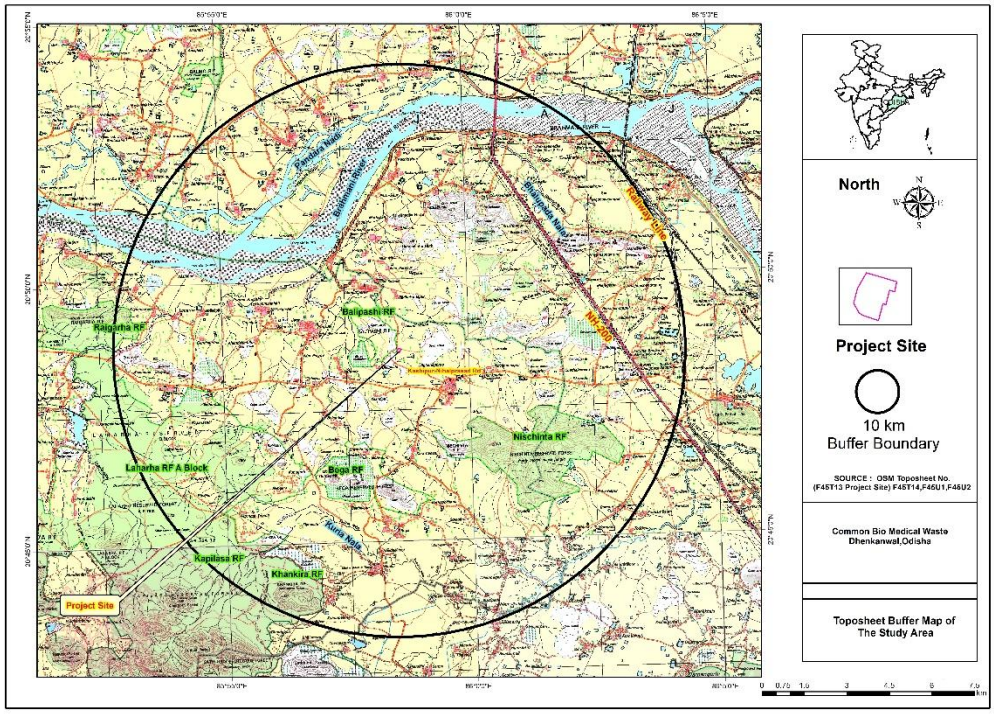

Figure-2: Study Area Map

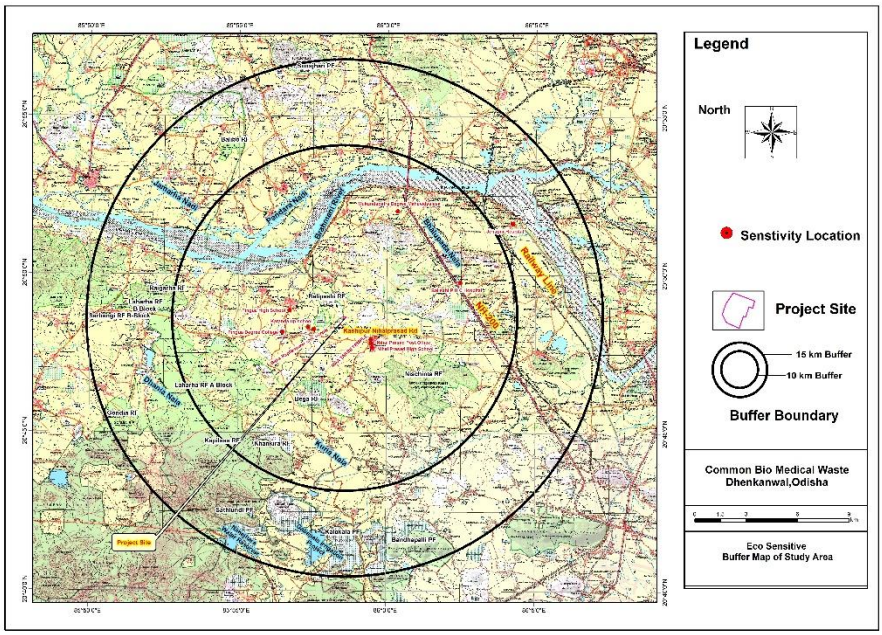

Figure-3: Eco-Sensitive Map – 15 km

Land Form, Land Use & Land Ownership.

Total land area of the project is 0.80 ha.

Table 1.1: List of the Water bodies present in Study Zone:

Location	Direction	Distance km
Nimajhara Water Resorver	SSW	13.6
Gabapala Irrigation Project	S	12.35
Brahmani River	NW	4.2
Pandara Nadi	NW	6.8
Jamarha Nadi	NW	7
Bhalupada Nala	E	4.5

Table 1.2: List of ESZ/ Forests (RF/PF) present in Study Zone:

Location	Direction	Distance km
Balipashi RF	W	Near Site
Nischint RF	SSE	3
Bega RF	SSW	3.4
Khankira RF	SW	7.7
Sathlundi PF	SSW	11.6
Bandhapalli PF	S	11.8

Kapilasa PF	SW	8.5
Laharha RF A Block	WSW	5.3
Balibo RF	NW	11.25
Kalokala PF	S	12
Sathlundi PF	SSW	11.4
Gondia RF	SW	13
Raigarha RF	W	9.2
Laharha RF B Block	W	10.8
Sarhangi RF B-Block	W	12.4
Ashwakhola RF	W	14

"No national park/Wildlife sanctuary present within the 10 km radius of the project site".

Table: 1.3 Land Use/ Land Cover Analysis of 10 km radius

S. No.	Land use	Area (Ha)	Area (%)
1	Agricultural Land	18333.38	57.57
2	Settlement	2719.02	8.54
3	Forest	4156.49	13.05
4	Water Bodies	2773.64	8.71
5	Wastelands	2918.32	9.16
6	Mining/Quarry	941.11	2.95
	Total Area	**31841.96**	**100**

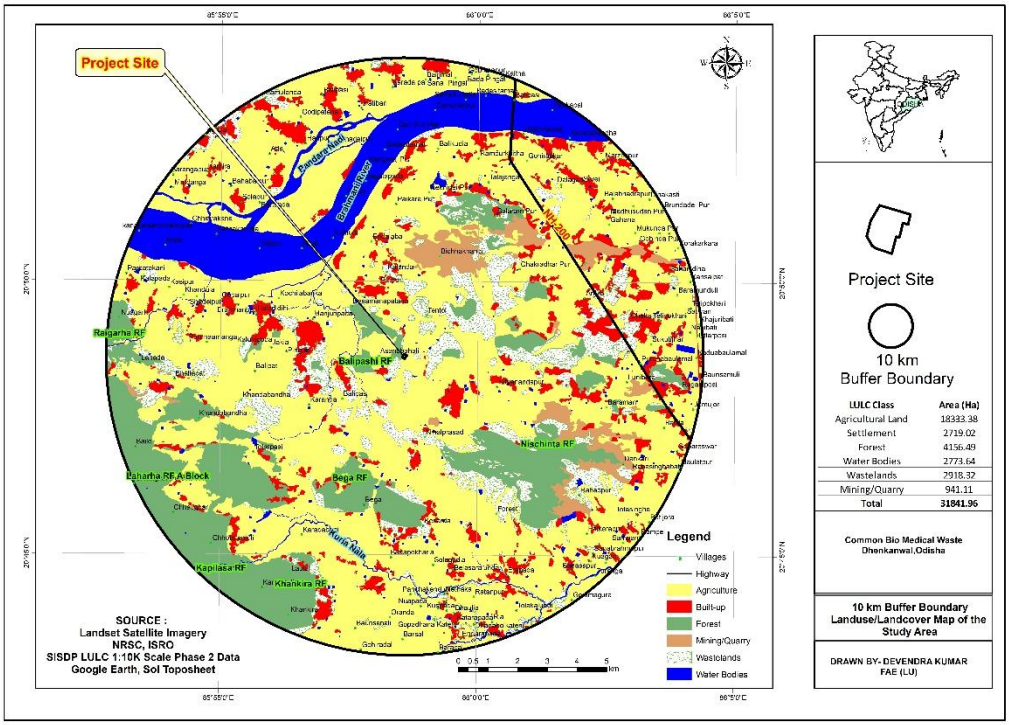

Figure: 4 Land Use Map

Climate, Rainfall and Temperature

Dhenkanal district in Odisha experiences a tropical wet and dry climate with hot summers (up to 100°F), warm monsoons (90°F–95°F), and cooler winters (around 84°F). It receives about 1,421.1 mm of rainfall annually, with the heaviest in July, and experiences an average humidity of 77%, higher during the monsoon. The district enjoys varying daylight from 10 hours 53 minutes in December to 13 hours 23 minutes in June, supporting diverse agriculture like paddy, groundnut, and mango.

Geomorphology:

Dhenkanal district in Odisha features a diverse geomorphology, with the rugged hills of the Eastern Ghats dominating the northern and central areas, composed of granite and gneiss. The district is drained by the Brahmani River and its tributaries, creating fertile floodplains and valleys. The southern region consists of low-lying plains and gentle undulating land, formed by alluvial deposits, ideal for agriculture. The soils range from red and lateritic in the hills to alluvial in the plains, supporting varied vegetation and agricultural activities.

Ecological Profile of the Study Area

Near the villages, the vegetation pattern has abruptly changed from that what it is seen in the forest areas. The species commonly found are *Mangifera indica, Delonix regia, Tamarindus indica, Cassia siamea, Terminalia belerica, Syzygium cumini, Ougeinia oojelnensis, Careya arborea, Treama orientalis,* etc. The shrubs and undergrowth are characterized by

Zizyphus oenoplia, Musa paradisiacal, Ipomoea cornea, Euphorbia ligularia and *Hibiscus rosa sinensis,* etc.

The conservation plan is recommended for species protected under schedule-I of Indian Wildlife Protection Act and green belt should be maintained.

3-tier greenbelt is proposed along the plant periphery.

Table 1.4: Schedule I Species found in the Buffer Zone

S. No.	English Name	Scientific Name	Schedule Status (WPA-1972)
1	Indian chameleon	*Chameleon calcaratus*	I
2	Common Rat Snake	*Ptyas mucosus*	I
3	Common Indian Krait*	*Bungarus caeruleus*	I
4	Bengal monitor	*Varanus bengalensis*	I
5	Russell's Viper	*Vipera russelli*	I
6	Indian Cobra	*Naja naja*	I
7	Brown Fish owl	*Ketupa zeylonensis*	I
8	Screech owl (Barn owl)	*Tyto alba*	I
9	Pariah kite (Black kite)	*Milvus migrans*	I
10	Small Fox	*Vulpes bengalensis*	I

Conservation Plan of Schedule I Species

Biological profile of study area revealed the presence of 8 schedules-I species which are listed in Table 2.1.

Biological importance of all these species along with their conservation and management planand environmental mitigation are as follows:

1. *Chamaeleo zeylanicus* (Indian Chameleon)

i. Classification:

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia

Order:	Squamata
Suborder:	Iguania
Family:	Chamaeleonidae
Genus:	*Chamaeleo*
Species:	***C. zeylanicus***

ii. Habitat

They live in the trees (arboreal). Their skin can change color when the temperature or light changes or if they are alarmed or aggressive (communication). They move slowly, watching for prey. They move with a bobbing motion.

iii. Food and Feeding

Chameleons eat insects primarily, but larger species, including the common chameleon, might even devour lizards and young birds. The following are some instances of different diets:

- The Arabian veiled chameleon, Chamaeleo calyptratus, is insectivorous, however when alternative sources of water are unavailable, it eats leaves. On a diet of crickets, it could be kept alive. They may consume up to 15–50 huge crickets in a single day.
- Small animals including amphibians, snails, ants, caterpillars, butterflies, geckos, worms, lizards, and other chameleons, and also plant material including delicate shoots, leaves, and berries, are eaten by the Jackson's chameleon (Trioceros jacksonii) of Kenya and northern Tanzania. Kale, apples, lettuce, dandelion leaves, tomatoes, bananas, crickets, and waxworms are all good sources of protein.
- Chamaeleo chamaeleon, the typical chameleon of North Africa, Europe, and the Near East, feeds primarily on wasps and mantises, accounting for over three-quarters of its diet.
- The quantity of food consumed is influenced by the temperature.
- Certain chameleons, such as the Madagascar panther chameleon, manage their vitamin D3 levels by introducing themselves to sunshine, this stimulates internal production of the vitamin, which their insect diet is deficient in.

iv. Conservation Status:

To prioritize conservation actions, conservation status of chameleons must first be assessed using a standard procedure that is both transparent and uses the best available scientific information (Rodrigues et al., 2006). The IUCN Red List of Threatened Species (hereafter referred to as “IUCN Red List”) is the international standard for assessing the

extent to which species are facing extinction (Rodrigues et al., 2006). By categorizing species into different threat categories, the IUCN Red List provides a compendium of knowledge on status and biology, and is often the starting point for conservation action. Also, by tracking the conservation status of species over time, trends are revealed that indicate whether conservation efforts are effective. Thorough assessments of the conservation status of the world's mammal and amphibian species have been completed (Stuart et al., 2004; Hoffmann et al., 2010), but a similar initiative for the reptiles has yet to be finished (but see, Böhm et al., 2013).

2. *Ptyas mucosa* (Common Rat Snake)

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia
Order:	Squamata
Suborder:	Serpentes
Family:	Colubridae
Genus:	*Ptyas*
Species:	***P. mucosa***

ii. Conservation Status:

Ptyas mucosa is not evaluated by IUCN, whereas; it is mentioned under the Schedule-II of Wildlife Protection Act (1972) in India. It has recently been hunted for its distinctive hood markings in the production of handbags. It is listed under the CITES treaty because it closely resembles other species that are threatened and in need of protection.

iii. Habitat:

Remain hidden in dark and silent places like rat holes, termite mounds, wood caves, under rocks or any narrow and dark place. Distributed in variety of forests including rainforest, scrub lands, semidesert, dry, moist and mixed deciduous forests, grasslands, mangroves, wetlands etc. Lives in almost all kinds of habitat due to its tendency to survive in tough conditions; this includes urban areas, dense & open forest, hills & plains, agricultural lands etc. Prefers wet surroundings during summer (shows semi aquatic behavior few times), while dry during

monsoon.

iv. Food and Feeding:

Ptyas mucosa feeds on a variety of prey mostly on rodents and toads; also feeds upon birds, small mammals, other snakes, all kind of lizards and their eggs, etc.

v. Ecological Threats and Conservation Plan:

- **Direct Population Threats**

Direct population threats include all reasons and actions which directly reduce the number of *Ptyas mucosa* in their respective habitats other than the natural death. Loss of forest areas along with the reduction of different small size animals due to climate change and deforestation are a major threat to *Ptyas mucosa* in India.

Conservation Plan:

Wild Life Protection Act (1972) provides us with the statutory framework for wildlife conservation, and declared that hunting of *Ptyas mucosa* is a deadly crime against wildlife. While, the forestation and grassland development will be done in the study area and surrounding the mining area for enhancement of habitat and protecting the loss of *Ptyas mucosa* diversity.

- **Conflicts with Human/Farmer:**

In India, several Ptyas mucosa are killed due to ignorance or out of fear when they enter habitation and capture goats or poultry. For some strange reasons, snakes have always been associated with fear in the minds of most people. The inborn fear regarding their toxic venom plays a key role in killing most snakes, irrespective of whether they are harmful or not.

Conservation Plan:

The workers are more prone to encounter the *Ptyas mucosa* in study area. The most basic requirements are willingness and inclination to learn and differentiate the poisonous and the no venomous snakes. Both, local villagers and workers will be educated regarding while conducting the awareness programme to play ecologically significant role in maintaining the ecological integrity of forests and other habitats of *Ptyas mucosa*.

- **Poaching:**

The beautiful and shiny skin of the *Ptyas mucosa* makes them target species for poachers. In some area the meat is eaten by locals as the fat is purported to have medicinal value. Also, *Ptyas mucosa* is hunted extensively for their patterned skin, which is made into leather. The skin of

Ptyas mucosa has high value in international market as used to manufacture leather goods, including boots and shoes.

Conservation Plan

During formal interview and discussion with locals it was noted that study area is not prone to poaching or any other wildlife violence related of *Ptyas mucosa*. But, precaution will be always taken while dealing with wildlife. If any kind of poaching or other offense is noticed; it will be immediately clued-up to the concern Forest and Wildlife Officials. More importantly, worker will be made aware of wildlife crime and also subsequent penalties and punishment.

- **Habitat threats/Loss**

Rapid degradation of forest areas, due to climate change degradation of grassland, swamps and marshes is a major threat to *Ptyas mucosa* because it causes population fragmentation. Furthermore, habitat degradation caused by overgrazing, overharvest of forest products, expansion of agricultural areas, and use huge amounts of pesticides agricultural areas also poses threats to the habitat of *Ptyas mucosa* as well as their prey material.

Conservation Plan

Their habitat will be artificially improved in the study area by planting suitable species along with the development of grasslands in the respective area. Any existing stream and pond will be preserved and no discharge of any harmful effluent will be drained in the stream. If needed artificial wetlands will be created to improve the micro-habitat of species. In order to maintain sufficient prey or food availability for the Ptyas mucosa, present in the study area will be protected with the involvement of workers as well as local people. Workers will be instructed not to disturb or damage any kind of wildlife.

3. Bungarus caeruleus (Common Krait)

i. Classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia
Order:	Squamata
Suborder:	Serpentes
Family:	Elapidae

Genus:	*Bungarus*
Species:	***B. caeruleus***

ii. Distribution and Habitat

This species is found in main Peninsular India from Sindh (Pakistan), to the West Bengal plains. It occurs throughout South India and Sri Lanka at elevations up to about 1600 m. It is also recorded from Afghanistan, Bangladesh, and Nepal (Slowinski, 1994). Its range comprises a wide variety of habitats. It is found in fields and low scrub jungle, as well as inhabited areas. It is known to take up residence in termite mounds, brick piles, rat holes, even inside houses. It is frequently found in water or in proximity to a water source. Nocturnal in nature, it is alert and active after dusk until early morning. During the day it is found generally resting inside rodent burrows, termite hills and brick and rubble piles (Sharma, 2013).

iii. Food Habits

Found in farms and gardens, the Common Krait is cannibalistic in nature and also preys on other snakes. The common krait feeds primarily on other snakes, including: "blind worms" and cannibalizes on other kraits, including the young. It also feeds on small mammals (such as rats, and mice), lizards and frogs. The young are known to eat arthropods (Castoe, 2007).

iv. Threats

The major threats to the species include indiscriminate killing due to fear of this highly venomous snake and also deforestation. They are very often victims of road kill, while in many parts of their range they are exploited for their meat and skin. Their venom regarded as medically useful is traded and high in demand and price (Ganesh, 2010).

v. Conservation strategy

Specific conservation measures for Indian Krait

• Awareness: The public shall be informed on a regular basis about species status, management and research and ways to reduce damage. The most influential ways of communication shall be chosen – radio, TV, biggest newspapers and other social media platforms. Seminars for specialists from relevant fields on snakes conservation news shall be held.

• Ban on poaching: Stricter implementation/ penalization for poaching, hunting and illegal trade of snake products.

• Encouragement of afforestation activities to prevent habitat loss

• For surveillance: With the people's participation some guides will be included from the adjoining villages in the project team which will keep alerting for any unwanted incidences to happen. They will be awarded for such surveillance support activities.

• For offending elements: The enforcement authorities will be informed and with their help action will be taken against such elements.

• For patrolling of the area: The forest department is expected to patrol the surrounding areas for curbing any prohibited activities. The project team may provide conveyance facilities to these teams on availability.

Hunting of Common Krait for their skin should be completely prohibited with the help of local people and Forest Department Officers.

• Provision of better lighting at highways and roads to avoid road kills.

4. *Varanus bengalensis* (Monitor Lizard)

i. Classification

Kingdom	Animalia
Phylum	Chordata
Class	Reptilia
Order	Squamata
Suborder	Lacertilia
Family	Varanidae
Genus	Varanus
Species	*V. bengalensis*

ii. Conservation Status

Varanus bengalensis is classified as least concern on the IUCN Red List of Threatened Species; moreover this species is mentioned under the Schedule-I of Wildlife Protection Act (1972). This listing indicates that it may become threatened with extinction and is in need of frequent reassessment.

iii. Habitat

The *Varanus bengalensis* is found mainly in the lower elevations, dry semiarid desert habitats, moist forest and the river valleys. They are found in a wide range of habitats, viz. river banks, by the side of canals, scrubby lands and agricultural land. They occupy burrows, dense vegetation, hollows of trees, rock cracks and crevices.

iv. Food and Feeding

Varanus bengalensis mainly feed on beetles, grubs, scorpions, snails, crabs, ants and other invertebrates. Vertebrate prey is comparatively rare, and includes frogs, fish, lizards, snakes and rodents. Adults of *Varanus bengalensis* may ascend vertical tree trunks, where they sometimes stalk and capture roosting bats. They sometimes feed on dead animals. In areas where livestock are common, they often visit dung, where they forage for beetles and other insects.

v. Ecological Threats and Conservation Plan

- **Direct Population Threats**

Direct population threats include all reasons and actions which directly reduce the number of *Varanus bengalensis* in their respective habitats other than the natural death. Loss of forest areas along with the reduction of different small size animals due to climate change and deforestation are a major threat to *Varanus bengalensis* India.

- **Conservation Plan**

The Wild Life Protection Act (1972) provides us with the statutory framework for wildlife conservation, and declared that hunting of *Varanus bengalensis* is a deadly crime against wildlife. While, forestation and grassland development will be done in the study area and surrounding the mining lease area for enhancement of habitat to protect loss animal diversity.

- **Conflicts with Human/Farmer**

Due to the loss of habitat they move towards agriculture land. Sometimes due to the lack of awareness farmer kill them that also a responsible factor for declining the monitor species.

- **Conservation Plan**

For the protection of *Varanus bengalensis*, awareness programme for workers and farmers in the buffer zone will be conducted. Beside these, respective habitats will be improved.

- **Poaching**

Poaching is major threats of monitor lizards. Generally, they are hunted for skin and their body fat. The eggs of monitor lizards are considered a delicacy and the entire animal is also eaten.

Body parts are also used for medicine to cure numerous ailments.

- **Conservation Plan**

According to the Wild Life Protection Act (1972) hunting and poaching of *Varanus bengalensis* is a deadly crime against wildlife. While, forestation and grassland development will be done surrounding the mining area for enhancement of habitat and protecting the loss of their diversity.

- **Habitat threats/Loss**

On account of rapid large-scale deforestation, urbanization, dams and hydroelectric projects, habitats of *Varanus bengalensis* declining day by day along with their population density. Other factors such as impact of climate changes and some biotic factors are also responsible for the population decline of the *Varanus bengalensis* species.

- **Habitat Improvement**

The *Varanus bengalensis* lives mostly in burrows in the ground which they dig themselves. For habitat improvement, afforestation will be done with suitable forage plants. Similarly the ponds, canals or water holes in the forest will be maintained in good condition along with grasslands near the ponds. The species planted as part of greenbelt will be also selected as per requirement of *Varanus bengalensis* and will be included in plan. The prey species preferred by *Varanus bengalensis* will be conserved to insure sufficient prey availability, which will also reduce the conflict with humans.

***5. Daboia russelli* (Russell's viper)**

i. Classification:

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia
Order:	Squamata
Family:	Viperidae
Genus:	*Daboia*
Species:	***D. russelii***

ii. Conservation Status:

The Russell Viper is classified as least concern on the IUCN Red List of Threatened Species while, it is mentioned under the Schedule-II of Wildlife Protection Act (1972) in India.

iii. Habitat:

Russell Viper is not restricted to any particular habitat, but does tend to avoid dense forests. It is mostly found in open, grassy or bushy areas, but may also be found in second growth forests (scrub jungles), on forested plantations and farmland. It is most common in plains, and hills of suitable habitat.

Also, this species is often found in highly urbanized areas and settlements in the countryside, the attraction being the rodents commensal with man.

iv. Food and Feeding:

Russell viper feeds primarily on rodents, especially murid species. However, it will eat just about anything; including rats, mice, shrews, squirrels, lizards, land crabs, scorpions, and other arthropods. Juveniles are crepuscular, feeding on lizards and foraging actively. As they grow and become adults, they begin to specialize in rodents. Indeed, the presence of rodents and lizards is the main reason they are attracted to human habitation.

v. Ecological Threats and Conservation Plan

- **Direct Population Threats**

Direct population threats include all reasons and actions which directly reduce the number of Russell viper in their respective habitats other than the natural death. Loss of forest areas along with the reduction of different small size animals due to climate change and deforestation are a major threat to Russell viper in India.

Conservation Plan:

Wild Life Protection Act (1972) provides us with the statutory framework for wildlife conservation, and declared that hunting of Russell viper is a deadly crime against wildlife. While, forestation and grassland development will be done in the study area and surrounding the mining area for enhancement of habitat and protecting the loss of Russell viper diversity.

- **Conflicts with Human/Farmer**

In India, several Russell viper are killed due to ignorance or out of fear when they enter habitation/road & highways; and capture goats or poultry. For some strange reasons, snakes

have always been associated with fear in the minds of most people. As far as Russell viper is concern they are lethargic and slow moving even in their native habitat.

Conservation Plan:

The workers are more prone to encounter the Russell viper in study area. Both, local villagers and workers will be educated regarding while conducting the awareness programme to play ecologically significant role in maintaining the ecological integrity of forests and other habitats of Russell viper. Also, workers will be educated and facilitate to avoid the any snake bite.

- **Poaching**

The beautiful and shiny skin of the Russell viper makes them target species for poachers. Sometimes, poacher caught them to use their fat for medicinal purposes. The skin of Russell viper has high value in international market as their patterned skin used to manufacture leather goods, including boots and shoes, etc.

Conservation Plan:

During formal interview and discussion with locals it was noted that study area is not prone to poaching or any other wildlife violence related of Russell viper. But, precaution will be always taken while dealing with wildlife. If any kind of poaching or other offense is noticed; it will be immediately clued-up to the concern Forest and Wildlife Officials. Besides this, workers will be trained and educated about the importance of Russell viper for ecology and ultimately for humans and worker will be made aware of wildlife crime.

- **Habitat threats/Loss:**

Rapid degradation of forest areas, due to climate change degradation of grassland and forest is a major threat to Russell viper because it causes population fragmentation. Furthermore, habitat degradation caused by overgrazing, overharvest of forest products, expansion of agricultural areas, and use huge amounts of pesticides agricultural areas also poses threats to the habitat of Russell viper as well as their prey material.

Conservation Action

India has established several large areas to protect the habitat of several endangered wildlife species. Their habitat will be artificially improved in the study area by planting suitable species along with the development of grasslands in the respective area. In order to maintain sufficient prey or food availability for the Russell viper, present in the study area will be protected with the involvement of workers as well as local people. If any Russell viper is spotted within or

nearby the lease area, it will be immediately informed to concern authority and suitable rescue plan will be adopted. Workers will be instructed not to disturb or damage any kind of wildlife

6. ***Naja naja*** **(Indian Cobra)**

i. Classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Reptilia
Order:	Squamata
Family:	*Elapidae*
Genus:	*Naja*
Species:	***N. naja***

ii. Conservation Status

Although, the Indian Cobra is not an endangered species, it has recently been hunted for its distinctive hood markings in the production of handbags. It is listed under the CITES treaty because it closely resembles other species that are threatened and in need of protection. This species is mentioned under the Schedule-II of Wildlife Protection Act (1972) in India.

iii. Habitat

Indian Cobra's occurs in a wide range of habitats, including grasslands, rocky foothills and in wild forest and in cultivated areas. They depend on a permanent source of water. Sometimes they can be found in abandoned mammal burrows, hollow trees, dense water reeds and mangrove thickets.

iv. Food and Feeding

The Indian cobra feeds on rodents, lizards and frogs. It bites quickly, and then waits while its venom damages the nervous system of the prey, paralyzing and often killing it. Like all snakes, Indian Cobra swallows its prey whole. This species sometimes enters buildings in search of rodent prey.

v. Ecological Threats and Conservation Plan

- Direct Population Threats

Direct population threats include all reasons and actions which directly reduce the number of Indian Cobra in their respective habitats other than the natural death. Loss of forest areas along with the reduction of different small size animals due to climate change and deforestation are a major threat to Indian Cobra's in India.

- Conservation Plan

The Wild Life Protection Act (1972) provides us with the statutory framework for wildlife conservation, and declared that hunting of Indian Cobra is a deadly crime against wildlife. Forestation and grassland development will be done in the study area for enhancement of habitat and protecting the loss of Cobra's diversity.

- Conflicts with Human/Farmer

Several Indian Cobra's are killed due to ignorance or out of fear when they enter habitation and capture goats or poultry. For some strange reasons, snakes have always been associated with fear in the minds of most people. The inborn fear regarding their toxic venom plays a key role in killing most snakes, irrespective of whether they are harmful or not.

- Conservation Plan

The workers are more prone to encounter the Indian Cobra in study area. The most basic requirements are willingness and inclination to learn and differentiate the poisonous and the no venomous snakes. The minute the farmers or the workers, spot a snake; they should be in a position to distinguish between a triangular and a round headed snake and the patterns associated with the snake. Both, local villagers and workers will be educated regarding while conducting the awareness programme to play ecologically significant role in maintaining the ecological integrity of forests and other habitats of Indian Cobra. Also, workers will be educated and facilitate to avoid the any snake bite. Following precautionary measures will be taken:

- Adequate lighting in and around the living quarters.
    - Fire wood stacks to be set up far away from the house.
    - Workers need to be protected with footwear.
    - Workers need to be provided with adequate lighting (torch lights) during night times.
- Poaching

The beautiful and shiny skin of the Indian Cobra makes them target species for poachers. In some area the meat is eaten by locals as the fat is purported to have medicinal value. Also, Indian Cobra's are hunted extensively for their patterned skin, which is made into leather.

The skin of Indian Cobra has high value in international market as used to manufacture leather goods, including boots and shoes.

- Conservation Plan

During formal interview and discussion with locals it was noted that study area is not prone to poaching or any other wildlife violence related of Indian Cobra. But, precaution will be always taken while dealing with wildlife. The contact information of concern wildlife and forest department will be provided to every worker or at the field office. If any kind of poaching or other offense is noticed; it will be immediately clued-up to the concern Forest and Wildlife Officials.

Moreover, workers will be trained and educated about the importance of Indian Cobra for ecology and ultimately for humans; an internal attraction towards the species will be tried to develop. More importantly, worker will be made aware of wildlife crime and also subsequent penalties and punishment.

- Habitat threats/Loss

Rapid degradation of forest areas, due to climate change degradation of grassland, swamps and marshes is a major threat to Indian Cobra because it causes population fragmentation. Furthermore, habitat degradation caused by overgrazing, overharvest of forest products, expansion of agricultural areas, and use huge amounts of pesticides agricultural areas also poses threats to the habitat of Indian Cobra as well as their prey material.

- Conservation Action

Although, India has established several large areas to protect the habitat of several endangered wildlife. For habitat improvement of the Indian Cobra, all possible activities will be carried out in the present study area. Their habitat will be artificially improved in the study area by planting suitable species along with the development of grasslands in the respective area. If needed artificial wetlands will be created to improve the micro-habitat of species.

If any Indian Cobra is spotted within or nearby the lease area, it will be immediately informed to concern authority and suitable rescue plan will be adopted. Workers will be instructed not to disturb or damage any kind of wildlife and their habitat. Time to time awareness camp will be conducted for workers and local people based on ecology and habitat protection of Wildlife.

7. Brown Fish Owl (*Ketupa zeylonensis)*

Domain:	**Eukaryota**
Kingdom:	**Animalia**
Phylum:	**Chordata**
Class:	**Aves**
Order:	**Strigiformes**
Family:	**Strigidae**
Genus:	***Ketupa***
Species:	***K. zeylonensis***

1. Habitat Protection and Management

- **Identify Critical Habitats**: Map and protect key habitats, such as wetlands, rivers, and lakes, that are essential for the Brown Fish Owl. Focus on areas with abundant fish populations, as these are crucial for the owl's diet.
- **Establish Protected Areas**: Advocate for the creation or expansion of wildlife sanctuaries, national parks, and conservation reserves in key habitats to prevent encroachment and disturbance.
- **Restore Degraded Wetlands**: Implement habitat restoration programs, especially in wetlands affected by pollution, invasive species, and human activity. Work on cleaning and re-vegetating degraded wetland areas to support the owl's prey species.

- **Water Quality Management**: Develop and implement policies for maintaining the quality of water bodies, which will directly benefit the Brown Fish Owl's prey species and overall ecosystem health.

2. Monitoring and Research

- **Population Surveys**: Conduct regular surveys to assess the population size, distribution, and breeding success of the Brown Fish Owl across its known habitats. This will help identify any threats to its survival and monitor changes in population dynamics.
- **Ecological Studies**: Research the owl's ecology, including its feeding habits, nesting behavior, and seasonal movements. Detailed studies will help understand habitat needs and potential threats to the species.
- **Monitoring Reproductive Success**: Focus on tracking nesting sites and monitoring breeding seasons to gauge the species' reproductive success and identify any disturbances that might affect the owl's breeding.
- **Tracking and Satellite Tagging**: Use GPS tracking and satellite technology to monitor the owl's movements and migratory patterns, particularly in areas with changing climates or water availability.

3. Sustainable Resource Management

- **Fishery Management**: Encourage sustainable fishing practices in areas where the Brown Fish Owl hunts to ensure that prey species (like fish and amphibians) remain abundant. Promote responsible fisheries management that does not lead to overfishing or ecosystem imbalance.
- **Reduce Pollution**: Implement strict regulations to control industrial, agricultural, and domestic pollution in aquatic ecosystems. This includes controlling the use of pesticides and fertilizers that affect water quality and prey species.
- **Minimize Habitat Disturbance**: Encourage practices that reduce human disturbance near owl habitats, particularly during the breeding season. This may involve limiting access to sensitive areas and regulating tourism.

4. Human-Wildlife Conflict Mitigation

- **Local Community Involvement**: Educate local communities living near owl habitats about the ecological role of the Brown Fish Owl and its importance in maintaining the balance of the ecosystem. Engage them in habitat protection efforts and create awareness about reducing hunting and disturbance.

- **Conflict Resolution**: Establish systems for resolving conflicts where human activities (like fishing, agriculture, or construction) threaten owl habitats. Promote compensation schemes or alternative livelihoods for communities involved in conservation efforts.
- **Reduce Roadkill**: In areas where owls may cross roads, implement measures like wildlife corridors, speed limits, and signage to reduce the risk of vehicle collisions.

5. Public Awareness and Education

- **Awareness Campaigns**: Conduct public outreach programs in local communities, schools, and through media to raise awareness about the Brown Fish Owl and its conservation needs. Highlight the owl's role in the ecosystem and the importance of protecting wetlands.
- **Eco-Tourism Initiatives**: Promote eco-tourism in areas where the Brown Fish Owl is found, provided it is done sustainably. Eco-tourism can help fund conservation efforts while educating the public about the species and the need to protect its habitats.

6. Policy and Legal Support

- **Strengthen Legal Frameworks**: Ensure that the Brown Fish Owl is listed under the **Wildlife Protection Act of 1972** and other national regulations to prohibit hunting, trade, or any harm to the species. Support local governments in enforcing these laws.
- **Policy Advocacy for Wetland Protection**: Advocate for stronger policies and laws that protect wetlands and aquatic habitats, considering their importance for biodiversity and for species like the Brown Fish Owl.
- **Incentives for Sustainable Practices**: Work with government agencies to offer incentives to local communities for adopting sustainable practices that contribute to wildlife conservation, such as sustainable fishing or wetland conservation.

7. Collaboration and Funding

- **Partnerships with NGOs**: Collaborate with national and international wildlife conservation NGOs to secure funding, technical expertise, and networking opportunities for the conservation of the Brown Fish Owl.
- **International Collaboration**: Since the species ranges across South and Southeast Asia, work with neighboring countries to implement cross-border conservation initiatives and ensure a cohesive conservation strategy.

8. Legislation and International Support

- **International Treaties and Agreements**: Engage with international wildlife conservation bodies like CITES (Convention on International Trade in Endangered Species) to ensure that international trade does not threaten the Brown Fish Owl.
- **Promote Wetland Conservation**: Advocate for India's participation in global initiatives focused on wetland conservation, which will benefit the Brown Fish Owl and other species dependent on wetlands.

8. Screech owl (Barn owl)

1. Habitat Protection and Management

- **Identification and Protection of Key Habitats**: Identify critical habitats such as forests, agricultural fields, grasslands, and open woodlands where Barn Owls thrive. Establish protected areas, especially in regions with high population densities of the species, to mitigate habitat destruction.
- **Preserve Traditional Nesting Sites**: Barn Owls often nest in barns, abandoned buildings, and hollow trees. Ensuring the protection of such structures is important. Create policies that safeguard these nesting sites from urbanization and misuse.
- **Forest Management**: Promote sustainable forest and land management practices that conserve the natural habitat of the Barn Owl, including controlling deforestation and habitat fragmentation. Encourage the conservation of tree cover that provides essential nesting sites for the owls.

2. Monitoring and Research

- **Population Surveys and Monitoring**: Conduct regular surveys to monitor the population size and health of the Barn Owl across different regions of India. This will help track any significant changes in their distribution or numbers.
- **Ecological Research**: Study the Barn Owl's feeding habits, breeding behavior, and

habitat preferences. Research the owl's role in controlling rodent populations, which can be a key point in garnering public support for its conservation.

- **Tracking Nesting Sites**: Regularly monitor known nesting sites to assess their status and protect them from disturbances, particularly during breeding seasons.

3. Human-Wildlife Conflict Mitigation

- **Awareness on Owl Conservation**: Educate local communities about the importance of Barn Owls in controlling rodent populations and their ecological role. Highlight the benefits of Barn Owls for agriculture and human health.
- **Safe Nesting Structures**: Promote the construction of safe, artificial nesting boxes in rural and agricultural areas, especially where natural sites are declining due to urbanization or deforestation. These boxes provide suitable nesting habitats for Barn Owls.
- **Reduce Persecution**: Discourage the hunting, trapping, and killing of Barn Owls due to superstition or mistaken beliefs. Strengthen enforcement of anti-poaching laws to protect owls.

4. Rodent Control Strategies

- **Promote Natural Rodent Control**: Advocate for the use of Barn Owls as a natural form of pest control, particularly in agricultural areas. Encourage farmers to avoid using excessive rodenticides, which may also poison the owls.
- **Public Education on Sustainable Agriculture**: Educate farmers about the ecological benefits of the Barn Owl in controlling crop-damaging rodents. Promote organic farming practices and minimize the use of harmful chemicals that may impact the owl population and its prey.

5. Public Awareness and Education

- **Community Involvement**: Work with rural and farming communities to raise awareness about the Barn Owl and its role in pest control. Engage them in owl conservation by encouraging the installation of owl boxes and creating safe nesting sites.
- **Awareness Campaigns**: Conduct nationwide campaigns, particularly in rural areas, to inform people about the importance of Barn Owls. Utilize media, school programs, and local conservation groups to spread the message.
- **Eco-tourism and Education**: Develop eco-tourism initiatives in areas where Barn Owls are abundant. Responsible tourism can provide funding for conservation activities while

also educating the public on the species' importance.

6. Legislation and Policy Support

- **Inclusion in Wildlife Protection Laws**: Ensure that the Barn Owl is included under the **Wildlife Protection Act of 1972**, offering it legal protection from hunting and persecution. Advocate for stronger enforcement of laws to protect the species from illegal killing.
- **Support for Agricultural Policies**: Push for the integration of Barn Owl conservation into agricultural policies, encouraging sustainable farming techniques that preserve natural habitats and protect wildlife.
- **Incentives for Conservation**: Provide incentives for farmers and local communities to adopt wildlife-friendly practices, including the protection of Barn Owls and other beneficial species.

7. Artificial Nesting Structures and Habitat Enhancement

- **Install Nesting Boxes**: Promote the installation of artificial nesting boxes in rural and agricultural areas where natural sites are scarce. These nesting boxes should be placed at safe, high locations, such as barns, silos, and large trees.
- **Enhance Habitat Features**: Encourage practices that enhance the habitat for Barn Owls, including maintaining tall trees, open fields, and suitable cover for hunting. Promote the restoration of abandoned buildings or barns as potential nesting sites.

8. Collaboration and Funding

- **Partner with NGOs and Wildlife Organizations**: Collaborate with national and international wildlife conservation organizations, including local NGOs, to support the Barn Owl's conservation. These partnerships can bring in expertise, funding, and resources to aid in conservation.
- **Government and Private Sector Support**: Work with government agencies, such as the Ministry of Environment, Forest and Climate Change, to secure funding for Barn Owl conservation. Encourage private sector involvement in supporting wildlife-friendly practices, such as responsible agriculture and sustainable land use.

9. Cross-Border Conservation Efforts

- **Regional Collaboration**: Since the Barn Owl is found across a wide range in South Asia, there should be regional cooperation with neighboring countries such as Bangladesh, Nepal, and Sri Lanka to ensure consistent conservation strategies across borders.

10. Research on Threats

- **Address Pollution**: Investigate the effects of pollution (e.g., pesticides, heavy metals) on the Barn Owl and its prey. Research will help develop strategies to mitigate these threats.
- **Assess Climate Change Impact**: Study the effects of climate change on Barn Owl habitats and populations, including changes in prey availability and nesting sites.

9. Pariah kite (Black kite)

1. Habitat Protection and Management

- **Identification and Protection of Key Habitats**: Identify critical habitats for the Black Kite, including urban areas, agricultural lands, and forested regions. Since Black Kites are often found around human settlements, it is essential to protect areas where they feed, breed, and roost.
- **Urban Habitat Management**: Protect urban ecosystems where Black Kites thrive, such as cities and towns with open spaces, garbage dumps, and sewage ponds, which provide abundant food resources. Encourage the preservation of green spaces and minimize urban sprawl that might affect these habitats.
- **Sustainable Land Use**: Promote sustainable agricultural practices that do not degrade the quality of habitat for Black Kites. This includes reducing the use of pesticides and promoting organic farming, which ensures a stable food source for these birds and helps

maintain their habitats.

- **Preserve Nesting Sites**: Black Kites often nest in tall trees and structures. Protecting these trees and nesting sites from destruction due to urban development, deforestation, or infrastructure projects is vital.

2. Population Monitoring and Research

- **Regular Population Surveys**: Conduct surveys across key habitats to monitor Black Kite populations, assess their distribution, and detect any significant trends in their numbers. These surveys will help track the health of the species and identify regions of concern.
- **Behavioral and Ecological Research**: Study the Black Kite's feeding habits, nesting preferences, migration patterns, and other ecological aspects to better understand its requirements and respond to any emerging threats. This includes tracking the movement of individuals to identify critical areas.
- **Research on Threats**: Investigate specific threats to the Black Kite, such as poisoning from pesticides, collisions with man-made structures, or electrocution from power lines. Understanding these risks will help create effective mitigation strategies.

3. Public Awareness and Education

- **Community Engagement**: Raise awareness among local communities, especially in urban and agricultural areas, about the importance of Black Kites in controlling pests (like rodents and insects). Engaging communities in conservation activities, such as nest protection, can help reduce human-wildlife conflict.
- **School and Media Campaigns**: Use schools, media, and social media platforms to spread awareness about Black Kites and their ecological role. Educational programs can help dispel myths and misconceptions about the species, encouraging people to protect rather than harm them.
- **Promote Positive Human-Kite Interactions**: Educate people to avoid harming Black Kites or disturbing their nests. Encourage safe interactions with wildlife, such as not feeding them unhealthy food and respecting their space.

4. Mitigation of Human-Wildlife Conflict

- **Prevent Poisoning**: Black Kites are vulnerable to poisoning from toxic chemicals, including pesticides and rodenticides. Work with farmers and urban authorities to regulate and reduce the use of harmful chemicals in areas frequented by the kites.
- **Reduce Collisions and Electrocutions**: Install bird-friendly designs on power lines,

such as insulated wires and perch deterrents, to prevent electrocution. Marking power lines with visible markers can also reduce collision risks.

- **Safe Nesting Sites**: In urban areas, collaborate with local governments to protect Black Kite nesting sites in trees and buildings. Advocate for the construction of artificial nesting platforms where natural nesting sites are scarce.

5. Sustainable Management of Food Resources

- **Waste Management**: Black Kites feed on garbage and carrion in urban areas. Improve waste management systems to prevent the birds from relying on unhealthy food sources, which could impact their health. Encourage community-based waste management practices that avoid attracting birds to hazardous waste sites.
- **Encourage Sustainable Farming**: Promote agricultural practices that allow Black Kites to continue benefiting from natural pest control. Reduced pesticide use and promoting organic practices will provide a stable food source for kites without compromising their health or the environment.

6. Legislation and Policy Support

- **Legal Protection**: Ensure the Black Kite is covered under the **Wildlife Protection Act of 1972** to provide legal protection against poaching, hunting, or disturbance. Strengthen the enforcement of these laws to ensure the protection of the species.
- **Urban and Rural Development Policies**: Advocate for policies that balance urban development with wildlife conservation. This includes enforcing zoning laws that protect bird habitats in cities and towns, such as preserving trees for nesting and reducing habitat fragmentation.
- **Support for Wildlife-Friendly Practices**: Provide incentives to farmers and urban developers who adopt wildlife-friendly practices, such as leaving green spaces for nesting or reducing the use of harmful chemicals in agriculture.

7. Habitat Restoration and Enhancement

- **Restoration of Degraded Habitats**: Where necessary, focus on restoring degraded habitats, such as deforested areas or agricultural land, to create better conditions for Black Kites. Promote the planting of native tree species in urban and rural areas that can provide natural nesting sites.
- **Enhance Connectivity Between Habitats**: Create wildlife corridors to connect fragmented habitats, allowing Black Kites and other wildlife to move freely between safe areas. This is particularly important in areas where urban sprawl has isolated natural

habitats.

8. Collaboration and Funding

- **Partnerships with NGOs**: Collaborate with local and international wildlife organizations to secure funding and expertise for Black Kite conservation efforts. NGOs can also help implement on-the-ground conservation actions.
- **Government and Corporate Support**: Work with government agencies to secure funding for Black Kite conservation and to implement sustainable land-use and development policies. Encourage corporate sector involvement in funding conservation programs.

9. Cross-Border Conservation Efforts

- **Regional Collaboration**: The Black Kite migrates across regions in Asia, so conservation efforts should include cross-border cooperation with neighboring countries such as Nepal, Bangladesh, and Myanmar. Shared conservation strategies can help ensure the species' long-term survival across its range.

10. Research on Climate Change Impact

- **Assess the Effects of Climate Change**: Research the potential impacts of climate change on the Black Kite's habitat, prey availability, and migration patterns. Adapt the conservation plan to address potential challenges posed by climate shifts, such as altered food availability or increased frequency of extreme weather events.

10. Small Fox (*Vulpes bengalensis)*

The Small Fox (Vulpes bengalensis), also known as the Bengal Fox, is a small, nocturnal fox found primarily in the Indian subcontinent, including India, Pakistan, and Bangladesh. Although it is not currently classified as globally endangered, it faces various threats such as habitat loss, human-wildlife conflict, and poaching. A comprehensive Wildlife Conservation Plan for the Bengal Fox in India should focus on habitat protection, reducing human-wildlife conflict, promoting sustainable practices, and improving public awareness. Below is a detailed conservation plan for the species:

1. Habitat Protection and Management

- Identification and Protection of Key Habitats: Identify and map the primary habitats of the Bengal Fox, which include open forests, grasslands, scrublands, and agricultural areas. Establish protected areas and conservation reserves in critical habitats to prevent further degradation and fragmentation.
- Control Habitat Fragmentation: Promote landscape connectivity by creating wildlife corridors to link fragmented habitats. This will help ensure genetic diversity and safe movement for the Bengal Fox, especially in regions affected by urbanization or agriculture.
- Address Habitat Degradation: Implement measures to reduce habitat degradation caused by deforestation, land conversion for agriculture, and infrastructure development. Encourage forest and grassland restoration programs that focus on replanting native species to restore natural habitats.
- Sustainable Land Management: Work with local communities and farmers to encourage land-use practices that are compatible with wildlife conservation. These include agroforestry, sustainable grazing, and minimizing the use of harmful pesticides and fertilizers.

2. Monitoring and Research

- Population Surveys: Conduct regular population surveys to assess the Bengal Fox's distribution and monitor any trends in population size. This will help understand the status of the species and identify areas requiring targeted conservation efforts.
- Behavioral and Ecological Studies: Research the ecology of the Bengal Fox, including its feeding habits, denning sites, and reproduction. Understanding the fox's role in the ecosystem and its interactions with other species will help shape effective management strategies.

- Tracking and Monitoring: Use GPS collars or camera traps to track the movements of Bengal Foxes and identify important areas for their survival, such as denning sites or hunting grounds. This will also provide valuable data on their home ranges and behavior patterns.
- Climate Change Impact: Study the potential impacts of climate change on Bengal Fox habitats, such as temperature fluctuations, changes in prey availability, and habitat suitability.

3. Human-Wildlife Conflict Mitigation

- Promote Coexistence with Farmers: The Bengal Fox is often seen as a pest by farmers due to its hunting of small livestock and poultry. It is essential to educate farmers about the ecological role of the Bengal Fox in controlling rodent populations and other pests. Provide support for creating fox-friendly farming practices, such as securing livestock and using non-lethal deterrents.
- Livestock Protection Measures: Encourage the use of safe and humane methods to protect livestock, such as building stronger enclosures or using predator deterrents like livestock guardian dogs. Educating farmers on non-lethal ways to manage wildlife interactions can reduce retaliation against foxes.
- Establish Compensation Schemes: Where livestock losses occur due to the Bengal Fox, establish compensation schemes for farmers to mitigate economic losses and reduce the incentive for killing foxes.

4. Public Awareness and Education

- Community Awareness Programs: Conduct outreach programs to raise awareness among local communities, particularly those living in and around Bengal Fox habitats. Educate people on the ecological importance of the species and how it helps control pests and maintain ecological balance.
- School and Media Campaigns: Use schools, local media, and social media platforms to spread awareness about the Bengal Fox. Incorporate its role in the ecosystem into educational curricula to foster understanding and respect for the species from a young age.
- Ecotourism Promotion: Develop responsible eco-tourism initiatives where people can observe the Bengal Fox in its natural habitat. Eco-tourism can provide economic benefits to local communities and serve as a tool for raising awareness about wildlife conservation.

5. Mitigation of Direct Threats

- Reduce Poaching and Illegal Hunting: The Bengal Fox faces threats from poaching and hunting for its fur or due to conflicts with humans. Strengthen the enforcement of wildlife protection laws and ensure that penalties for poaching are strictly enforced.
- Control Roadkill: Foxes are often killed by vehicles while crossing roads. Implement measures such as wildlife crossings, signs, and speed limits in areas where Bengal Foxes are known to frequent. Additionally, use vehicle collision data to identify high-risk areas and prioritize mitigation efforts.

Tentative Budget for Wildlife Conservation Plan of Schedule-I Species

As detailed above, there are 10 Schedule-I species in the buffer area. Following Conservation plan is proposed with a budget of INR 10 Lakhs.

Table 1.5: Expenditure for Conservation Plan to be Implemented in Three Years

S. No.	Proposed Conservation Activity	Capital Cost (INR Lakhs)
1	Construction of Water Holes/Khelis in the surrounding buffer area and their regular filling with water.	3.0
2	Habitat improvement activities and food availability for reptiles like development of grassland/ pasture land in surrounding buffer area, creation of bushy structures for black partridges, development of suitable roosting, creation of tree grooves at suitable places in buffer areas, development of some den like structures for big cats.	5.5
3	Development of tree grooves in the nearby areas.	2.5
4	Plantation of native plant species in the buffer areas.	2.5
5	Establishment of trained Primary response team (village level) for proper rescue of injured wild animals in distress to avoid man–animal conflict and provision for training of rescue teams.	2.5
6	Providing funds for District Forest Department for awareness generation of local people, labour, different age group students, distribution of posters, pamphlets, fixing signages and organizing awareness camps.	2.0
7	Distribution of Artificial Wooden Nest for Birds.	2.0
TOTAL		**10**

Proposed year wise funds allocation			
Years	**1st (2025-26)**	**2nd (2026-27)**	**3rd (2027-28)**
Amount in INR Lakhs	3.5	3.5	3

Annexure-V

भारतीय गुणवत्ता परिषद्
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The organization is accredited as ***Category-A*** *under the QCI-NABET* ***Scheme for Accreditation of EIA Consultant Organization, Version 3****: for preparing EIA/EMP reports in the following Sectors-*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	River Valley projects	3	1 (c)	A
3.	Thermal power plants	4	1 (d)	A
4.	Coal Washeries	6	2(a)	A
5.	Mineral beneficiation	7	2 (b)	A
6.	Metallurgical industries	8	3 (a)	A
7.	Cement Plants	9	3(b)	A
8.	Coke oven plants	11	4 (b)	A
9.	Asbestos milling and asbestos based products	12	4 (c)	A
10.	Synthetic organic chemicals industry	21	5 (f)	A
11.	Distilleries	22	5 (g)	A
12.	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7(c)	A
13.	Bio-medical waste treatment facilities	32A	7 (da)	B
14.	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
15.	Common Municipal Solid Waste Management Facility	37	7 (i)	B
16.	Building and construction projects	38	8 (a)	B
17.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated October 15, 2024 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3406 dated November 11, 2024. The accreditation needs to be renewed before the expiry date by Grass Roots Research & Creation India (P) Ltd, Noida following due process of assessment.

Issue Date
November 11, 2024

Valid up to
August 16, 2027

Dr. Ajay Kumar Jha
(Sr. Director, NABET)

Certificate No.
NABET/EIA/24-27/RA 0354

Prof (Dr) Varinder S Kanwar
(CEO NABET)

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Project Proposal Conformity with Bio-Medical Waste Management Rules, 2016

The **Bio-Medical Waste Management Rules, 2016**, notified by the Ministry of Environment, Forest and Climate Change (MoEF&CC) on 28th March 2016, provide a regulatory framework for the management of bio-medical waste (BMW) in India. These rules aim to ensure proper handling, segregation, collection, storage, transportation, treatment, and disposal of bio-medical waste in an environmentally sound manner, thereby safeguarding public health and reducing the adverse environmental impacts of improper waste disposal.

In line with these stipulations, the project proposal addresses each of the required guidelines outlined in the Bio-Medical Waste Management Rules, 2016. Below is a detailed description of how the project proposal aligns with these key provisions:

1. Waste Segregation at Source

The proposal ensures that all bio-medical waste generated will be properly segregated at the point of generation into various categories (such as Yellow, Red, Blue, and White) as prescribed under the BMW Rules. The project incorporates color-coded bins for each category of waste and specifies the types of materials to be placed in each bin (e.g., anatomical waste in yellow bins, sharps in blue bins, etc.). The segregation process will be carried out by trained staff, following clear guidelines to prevent cross-contamination and improper disposal.

2. Authorization

As required by the BMW Rules, the proposal includes plans for obtaining the necessary authorization from the State Pollution Control Board (SPCB) or the Pollution Control Committee (PCC) for handling and managing bio-medical waste. The authorization ensures compliance with local regulations and confirms that the project will operate under the oversight of relevant regulatory bodies.

3. Storage and Labeling

The project outlines specific provisions for the storage of bio-medical waste, ensuring that waste is stored in secured areas away from general public access. The waste will be appropriately labeled, in compliance with the BMW Rules, to clearly identify the type of waste, the risk level, and any required safety instructions for handling. The project includes dedicated storage areas that are easily accessible to authorized personnel and designed to prevent leakage or contamination.

4. Treatment and Disposal

The proposal provides a detailed plan for the treatment and disposal of bio-medical waste. It includes the installation of appropriate treatment facilities, such as autoclaves, incinerators, or shredders, to ensure the safe disposal of waste. The methods used will be in accordance with the specifications laid out in the BMW Rules, including maintaining temperature and time parameters for effective sterilization and ensuring that the waste is rendered non-hazardous before disposal. The disposal sites will also comply with environmental standards to prevent pollution.

5. Transportation of Waste

The project proposal ensures that bio-medical waste will be transported in leak-proof, puncture-resistant containers that are labeled according to the categories of waste. The transportation process will follow the guidelines set forth in the BMW Rules, with the use of dedicated vehicles for BMW that are not used for any other type of waste, ensuring the safe and secure movement of the waste to the treatment or disposal facility.

6. Occupational Safety and Training

In compliance with the BMW Rules, the project includes provisions for regular training and sensitization of staff handling bio-medical waste. This includes both operational staff and those involved in the transportation, treatment, and disposal phases. The staff will be trained on proper waste segregation, handling, personal protective equipment (PPE) usage, and safety protocols to minimize health risks associated with exposure to hazardous waste.

7. Record Keeping and Reporting

As per the BMW Rules, the project will maintain accurate records of waste generation, segregation, storage, treatment, and disposal. The records will be documented electronically and include information such as the quantity of waste generated, the types of waste, the mode of treatment, and disposal methods. These records will be readily available for inspection by regulatory authorities. The project also includes a reporting mechanism to submit periodic reports to the State Pollution Control Board and other relevant authorities.

8. Compliance with the Standards for Incinerators and Other Treatment Technologies

The project adheres to the standards specified in the BMW Rules regarding the operation of incinerators, autoclaves, and other treatment technologies. The proposal ensures that the treatment equipment installed meets the prescribed emission standards and that any emissions from incinerators are within the permissible limits, thus reducing environmental impacts and ensuring compliance with air quality standards.

9. Public Awareness and Stakeholder Engagement

The project proposal includes initiatives to raise public awareness about the importance of proper bio-medical waste management. This includes outreach programs for healthcare facilities, local communities, and stakeholders, ensuring that they understand the risks associated with improper waste management and the benefits of following the prescribed guidelines.

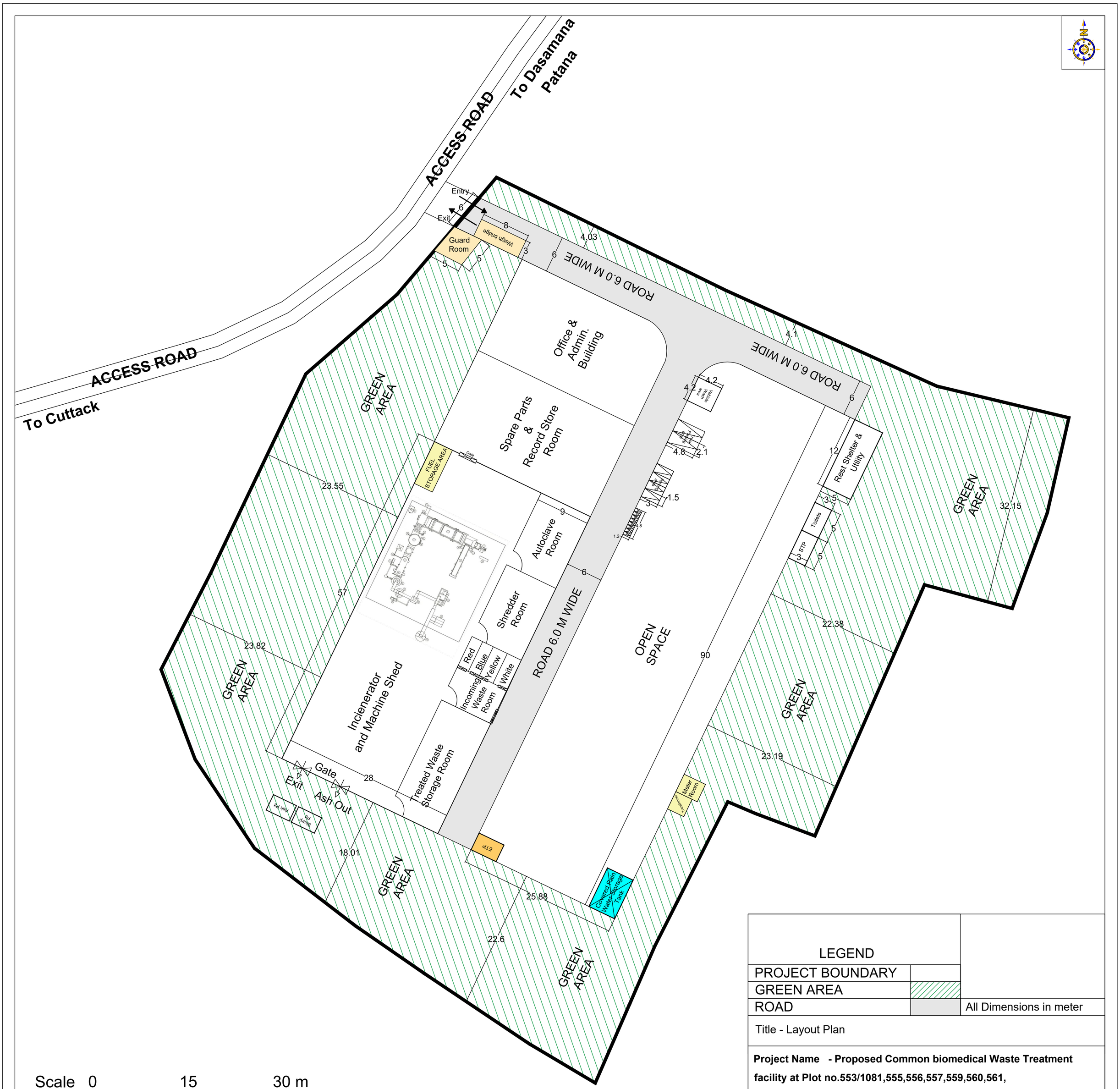
10. Monitoring and Evaluation

The project outlines a system of continuous monitoring and evaluation to ensure that all bio-medical waste management practices are in compliance with the Bio-Medical Waste Management Rules, 2016. Regular audits will be conducted to assess the effectiveness of waste segregation, storage, treatment, and disposal processes. The project also includes provisions for corrective actions in case of non-compliance or incidents.

Conclusion

The project proposal comprehensively addresses the stipulations laid out in the **Bio-Medical Waste Management Rules, 2016**, and ensures that all activities related to bio-medical waste management will be conducted in a safe, sustainable, and environmentally responsible manner. By adhering to these rules, the project aims to mitigate the risks associated with bio-medical waste and contribute to a cleaner, healthier environment.

Annexure-VII



LEGEND		
PROJECT BOUNDARY		
GREEN AREA		
ROAD		All Dimensions in meter

Title - Layout Plan

Project Name - Proposed Common biomedical Waste Treatment facility at Plot no.553/1081,555,556,557,559,560,561, 562,563,565,566,567 tehsil/thana-Gadai Distt. Dhenkanwal, Odisha.

Annexure-VIII

Schedule I Form No.39-A

ଖତିୟାନ

ମୌଜା : ଅସନ ବାହାଳି
ଥାନା : ଗଁଦିଆ
ଥାନା ନମ୍ବର : "166"

ତହସିଲ : ଗଁଦିଆ
ତହସିଲ ନମ୍ବର : "488"
ଜିଲ୍ଲା : ଢ଼େଙ୍କାନାଳ

ଜମିଦାରଙ୍କ ନାମ ଓ ଖେୱାଟ ବା ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	ଓଡିଶା ସରକାର ଖେୱାଟ ନମ୍ବର					
1) ଖତିୟାନର କ୍ରମିକ ନମ୍ବର	123/124					
2) ପ୍ରଜାର ନାମ, ପିତାର ନାମ, ଜାତି ଓ ବାସସ୍ଥାନ	ଏମ.କେ.ଡି ଇକୋ କ୍ଲିନ ପ୍ରାଇଭେଟ ଲିମିଟେଡ ତରଫ ନିର୍ଦ୍ଦେଶକ ଚିତ୍ତରଞ୍ଜନ ଦାଶ ପି:ନୃସିଂହ ଚରଣ ଦାଶ ଜା: ବ୍ରାହ୍ମଣ ବା: ସା-ଇଟାପଡା, କୋଲରା, ପୋ-ଦେସୁଲି, ଥା-ଗୋପ, ଜି-ପୁରୀ - 752107					
3) ସ୍ୱତ୍ୱ	ରୟତି					
4) ଦେୟ :	ଜଳକର	ଖଜଣା	ସେସ୍	ନିସ୍ତାର ସେସ୍ ଓ ଅନ୍ୟାନ୍ୟ ସେସ୍ ଯଦି କିଛି ଥାଏ	ମୋଟ	5) କ୍ରମବର୍ଦ୍ଧନଶୀଳ ଖଜଣାର ବିବରଣି
		56.00	42.00	5.00	103.00	
6) ବିଶେଷ ଅନୁସଙ୍ଗ ଯଦି କିଛି ଥାଏ	ଦାଖଲ ଖାରଜ କେଶ ନଂ 861/2024 ହୁକୁମ ମୁତାବକ କ୍ରୟ ସୁତ୍ରେ ପୁରାତନ ଖାତା ନଂ 65 ରୁ ଦାଖଲ ଖାରଜ କେଶ ନଂ 897/2024 ଓ OLR U/S 8A କେ ନଂ 31/2024 ହୁକୁମ ମୁତାବକ କିସମ ପରିବର୍ତ୍ତନ ସୁତ୍ରେ ଉକ୍ତ ଖାତା ର ସମସ୍ତ ପ୍ଲଟ ଗୁଡିକର କିସମ ପରିବର୍ତ୍ତନ କରାଗଲା ଓ ଅନ୍ୟାନ୍ୟ ଇନ୍ଦ୍ରାଜମାନ କାଏମ ରଖାଗଲା ଏବଂ ଏହା ର ସମସ୍ତ ପ୍ଲଟ ଗୁଡିକ ଶିଳ୍ପ ବାଣିଜ୍ୟ ଓ ବ୍ୟବସାୟ ବ୍ୟବହାର ନିମନ୍ତେ ଉଦ୍ଦିଷ୍ଟ					

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ଖଜଣା ଧାର୍ଯ୍ୟ ତାରିଖ - 01/04/1984

ଖତିୟାନର କ୍ରମିକ ନଂ : 123/124		ମୌଜା : ଅସନ ବାହାଳି				ଜିଲ୍ଲା : ଢେଙ୍କାନାଳ
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			ଏ.	ଡି.	ହେକ୍ଟର	
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555	ଘରବାରି	ଉ: ନିଜ ଦ: ନିଜ	0	0800	0.0324	
556	ଘରବାରି	ଉ: ନିଜ ଦ: ନିଜ	0	1200	0.0486	
557	ଘରବାରି	ଉ: ନିଜ ଦ: କୈଳାଶ ମଳିକ ଓଗେର	0	1200	0.0486	
559	ଘରବାରି	ଉ: ନିଜ ଦ: ନିଜ	0	0400	0.0162	
560	ଘରବାରି	ଉ: ନିଜ ଦ: ନିଜ	0	0400	0.0162	
561	ଘରବାରି	ଉ: ନିଜ ଦ: ନିଜ	0	0500	0.0202	
562	ଘରବାରି	ଉ: ପଠାଣି ସାହୁ ଓଗେର ଦ: ପଠାଣି ସାହୁ ଓଗେର	1	1700	0.4735	
563	ଘରବାରି	ଉ: ପଠାଣି ସାହୁ ଓଗେର ଦ: ପଠାଣି ସାହୁ ଓଗେର	0	0400	0.0162	
565	ଘରବାରି	ଉ: ରଘୁ ସାହୁ ଦ: ଅନନ୍ତ ସାହୁ	0	2000	0.0809	
566	ଘରବାରି	ଉ: ପଠାଣି ସାହୁ ଓଗେର ଦ: ପଠାଣି ସାହୁ ଓଗେର	0	2400	0.0971	
567	ଘରବାରି	ଉ: ପଠାଣି ସାହୁ ଓଗେର ଦ: ସରହଦ ମୌଜା ବାଲିପସି	0	3800	0.1538	
12 plots			**2**	**6500**	**1.0725**	

Standard Operating Procedure (SOP) for Sampling and Monitoring of Total Dioxins and Furans

1. Purpose

The purpose of this SOP is to establish a standardized method for the collection, handling, and analysis of dioxins and furans in environmental samples. The goal is to ensure that the sampling and monitoring procedures are conducted in a way that is accurate, reproducible, and compliant with regulatory requirements for total dioxins and furans.

2. Scope

This procedure covers:

- Sampling of air, water, soil, and sediment for dioxins and furans.
- Handling and storage of samples.
- Laboratory analysis and quality control for determining the concentrations of dioxins and furans.
- Documentation and reporting of results.

3. Definitions

- **Dioxins and Furans**: A group of chemically related compounds known as Persistent Organic Pollutants (POPs). They are primarily byproducts of industrial processes, particularly combustion.
- **Total Dioxins and Furans**: Refers to the sum of dioxins and furans, typically reported as toxic equivalents (TEQ) to account for the varying toxicity of individual compounds.

4. Responsibilities

- **Environmental Monitoring Team**: Responsible for conducting the sampling and ensuring adherence to the procedures outlined in this SOP.
- **Laboratory Staff**: Responsible for analyzing the samples according to established methods and ensuring the accuracy of the data.
- **Quality Control Officer**: Ensures that all aspects of the sampling, analysis, and reporting meet the quality standards.

5. Sampling Procedure

Sampling should be performed in accordance with the following steps:

5.1 Selection of Sampling Locations

- Choose sampling locations based on the potential sources of dioxins and furans (e.g., near industrial facilities, incineration plants, or landfills).
- Locations should be selected to represent various environmental media (air, water, soil, etc.) and to capture potential variations in contamination.

5.2 Sampling Equipment

- **Air Sampling**: Use high-volume air samplers with appropriate filters (e.g., quartz fiber filters) for particulate matter and sorbent tubes or cartridges for gaseous pollutants.
- **Water Sampling**: Use glass containers that are clean, pre-conditioned, and capable of preserving the sample during transport.
- **Soil/Sediment Sampling**: Use stainless steel or glass tools to avoid contamination.
- **Personal Protective Equipment (PPE)**: Ensure the use of gloves, masks, and protective clothing during sampling to avoid cross-contamination.

5.3 Sampling Techniques

- **Air Samples**:
    - Perform air sampling using an isokinetic sampler or high-volume air sampler for a specified duration, typically 8 hours, at a flow rate sufficient to collect representative particles or gases.
    - Filter the air through a pre-cleaned quartz fiber filter.
- **Water Samples**:
    - Collect water samples from different depths if needed to obtain a representative sample.
    - Filter the water to remove particulate matter.
- **Soil/Sediment Samples**:
    - Collect samples at different depths depending on site conditions.
    - Use a composite sampling method, collecting multiple sub-samples from various locations within the target area.

5.4 Sample Handling and Preservation

- Immediately label each sample with a unique identifier, location, date, and time of collection.
- Store air filters in a cool, dry environment.
- Water and soil samples should be kept cool (4°C) and transported to the laboratory as soon as possible.
- Ensure samples are kept in contamination-free containers and avoid any exposure to sunlight or heat.

5.5 Sample Transportation

- Transport samples to the laboratory using coolers with ice packs to maintain sample integrity.
- Ensure proper documentation accompanies each sample during transport.

6. Analysis Procedure

- **Preparation**:
  - Samples are pre-treated to remove interferences. This may include extraction using solvents such as hexane or toluene.
  - Clean-up procedures (e.g., silica gel chromatography) are carried out to separate dioxins and furans from other substances.
- **Instrumental Analysis**:
  - High-resolution gas chromatography coupled with high-resolution mass spectrometry (HRGC-HRMS) is the preferred method for detecting and quantifying dioxins and furans.
  - The analysis should be conducted following recognized standards, such as USEPA Method 1613 or equivalent methods.
- **Quality Control (QC)**:
  - Implement quality control measures like calibration curves, blanks, spiked samples, and duplicate analyses to ensure the accuracy and precision of results.
  - Perform matrix spike analyses to confirm that the method performs well across different sample types.
- **Results Reporting**:
  - Results are reported in terms of total dioxins and furans, often expressed in Toxic Equivalency (TEQ) units (ng TEQ/kg for solids and ng TEQ/m^3 for air).
  - Include details of the analysis process, the detection limits, and any anomalies or deviations observed during sampling and analysis.

7. Health and Safety Considerations

- Ensure that all personnel are trained in the proper handling of hazardous materials and the specific risks associated with dioxins and furans.
- Handle all samples and solvents in accordance with safety guidelines.
- Use appropriate PPE during sampling and laboratory work, including gloves, lab coats, masks, and goggles.

8. Documentation and Reporting

- Maintain records of sample collection, transportation, analysis, and results.

- Include a chain of custody document to track each sample from collection through analysis.
- Ensure that results are documented in a clear and standardized format.

9. Quality Assurance and Quality Control (QA/QC)

- Perform regular calibration of equipment to ensure accurate sampling and analysis.
- Include procedural blanks, field blanks, and duplicate samples in the sampling process to monitor for contamination.
- Review laboratory reports and ensure data completeness, accuracy, and consistency.

10. Compliance and Regulatory Standards

- Ensure that all sampling, handling, and analysis are in compliance with applicable local, national, and international standards and regulations, such as the USEPA, European Union directives, or other relevant environmental standards.

Annexure-X

सत्यमेव जयते

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु छूट प्रमाण पत्र)
Certificate of Exemption for Ground Water Withdrawal

Project Name:	M/s Mkd Eco Clean Pvt Ltd		
Project Address:	Plot No:143/3933, Ihb Colony, Sishupalgarh		
Town:	Bhubaneswar	Block:	Bhubaneswar
District:	Khordha	State:	Odisha
Communication Address:	M/s Mkd Eco Clean Pvt Ltd, Plot No:143/3933, Ihb Colony, Sishupalgarh, Bhubaneswar, Khordha, Odisha - 751002		
Address of CGWB Regional Office :	Central Ground Water Board South Eastern Region, Bhujal Bhawan, Khandagiri Square, Nh-5, Bhubaneshwar, Khordha, Odisha - 751030		

1.	Application No.:	21-4/5819/OR/IND/2024	2.	Category: (GWRE 2023)	Semi Critical
3.	Project Status:	New Project	4.	**Valid From**	09/06/2024
5.	**Valid up to**	Till adherence to provision(s) under which this exemption has been obtained (subject to compliance to related conditions) or till any further orders issued by this authority, whichever is earlier.			

6. Ground Water Abstraction Permitted:

Fresh Water		Saline Water		Dewatering		Total	
m³/day	m³/year	m³/day	m³/year	m³/day	m³/year	m³/day	m³/year
9.50							

7. Exemption under Para 1.0 (v) of guidelines

This exemption letter is being issued under relevant provision(s) of extant guidelines.

The firm shall install digital water flow meter on all common outlet points and maintain the logbook.

This certificate is system generated and based on information provided by the applicant. CGWA has not verified the claim made by applicant. Any false information furnished/ violation by the applicant, shall invite legal action against him/her as per S.O. 3289(E) dated 24/09/2020.

If, at any stage, it is established that this exemption letter has been obtained on the basis of false/ fake document(s), the exemption letter shall be deemed cancelled and extant penal provisions shall be applied on the firm.

यह इग्ज़ैमप्शन (छूट) पत्र वर्तमान दिशानिर्देशों के प्रासंगिक प्रावधानों के तहत जारी किया जा रहा है।

फर्म समस्त कॉमन निर्गम बिंदुओं पर डिजिटल जल प्रवाह मीटर स्थापित करेगी और लॉगबुक बनाए रखेगी।

यह प्रमाण पत्र सिस्टम जनरेटेड है और आवेदक द्वारा प्रदान की गई जानकारी पर आधारित है। CGWA ने आवेदक द्वारा किए गए दावे का सत्यापन नहीं किया है। आवेदक द्वारा दी गई कोई भी गलत सूचना/उल्लंघन, एसओ 3289(ई) दिनांक 24/09/2020 के अनुसार उसके खिलाफ कानूनी कार्रवाई को आमंत्रित करेगा।

यदि, किसी भी स्तर पर यह स्थापित हो जाता है कि यह इग्ज़ैमप्शन (छूट) पत्र गलत/ नकली दस्तावेज़ के आधार पर प्राप्त किया गया है, तो इग्ज़ैमप्शन (छूट) पत्र निरस्त माना जाएगा और फ़र्म पर मौजूदा दंडात्मक प्रावधान लागू किए जाएंगे।

This is an auto generated document & need not to be signed.

Term and conditions:

i. All disputes are subject to Delhi Jurisdiction.
ii. Any complaint in regard to the rates will not be entertained.

Member-Secretary
CGWA, New Delhi

18/11, जामनगर हाउस, मानसिंह रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Mansingh Road, New Delhi-110011
Phone: (011) 23383561 Fax: 23382051, 23386743
Website: cgwa-noc.gov.in

पानी बचाये – जीवन बचाये
SAVE WATER - SAVE LIFE

CENTRAL GROUND WATER AUTHORITY

Annexure-XI

E-mail: paribesh1@ospcboard.org
Website: www.ospcboard.org

STATE POLLUTION CONTROL BOARD, ODISHA

[DEPARTMENT OF FOREST, ENVIRONMENT & CLIMATE CHANGE, GOVERNMENT OF ODISHA]
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII
Bhubaneswar – 751012

No. 1853 / **IND-II-CTE-Misc-374/2024-25** **Date:** 31.01.2025 /
Through E-mail / Speed post

To

Shri Lipshit Dash, Director
M/s MKD Eco Clean Private Limited
Plot No. 143/3933, IHB Colony, PO- Sisupalgarh,
Bhubaneswar – 751002
(Mail id: mkdecoclean@gmail.com)

Sub: Distance authentication w.r.t. proposed Common Bio-Medical Waste Treatment Facility at Village- Asana Bahali, PO- Pingua, PS- Gandia, Tahsil- Gandia, District- Dhenkanal by M/s MKD Eco Clean Private Limited

Ref: i. SPCB letter no. 998/IND-II-CTE-Misc-374/2024-25 dated 15.01.2025
ii. Your letter dated 18.01.2025

Sir,

With reference to above, it is to intimate that the distance criteria for establishment of Common Bio-Medical Waste Treatment Facility (CBWTF) at Village- Asana Bahali, PO- Pingua, PS- Gandia, Tahsil- Gandia, District- Dhenkanal, the Latitude and Longitude of existing CBWTFs operating in Odisha to be referred are as following;

Sl. No.	Name and location of CBWTF	Latitude	Longitude
1.	M/s Sani Clean Pvt. Ltd., At- Tangiapada, District- Khurda	20^0 12' 31.50" N	85^0 36' 38.30" E
2.	M/s Mediaid Marketing Services, At- Seragada, District- Ganjam	19^0 31' 34" N	84^0 33' 14" E
3.	M/s Mediaid Marketing Services, At- Amsaranga, District- Sundargarh	22^0 01' 18" N	84^0 09' 53" E
4.	M/s Renewable Envirogic Pvt. Ltd., At- Sialbabal, Jhankarpali, District- Bolangir	20^0 75' 37" N	83^0 38' 75" E

This is in supersession to earlier SPCB letter no. 998/IND-II-CTE-Misc-374/2024-25 dated 15.01.2025.

Yours faithfully,

31/1/2025

ADDL. CHIEF ENV. ENGINEER

Memo No. 1854 / **Date** 31.01.2025 /

Copy forwarded to the CEE (BMW), SPCB, Odisha, Bhubaneswar / Regional Officer, SPCB, Odisha, Angul for information.

31/1/2025

ADDL. CHIEF ENV. ENGINEER

In a **Biomedical Waste Handling Project**, the potential for contamination due to surface runoff is a serious concern, especially in areas where hazardous materials are handled. To prevent contamination of waste and to avoid runoff from reaching nearby water reservoirs, a series of precautionary measures must be implemented. Here are key strategies:

1. Site Design and Waste Handling Area Layout

- **Elevated Waste Storage Areas**: Store biomedical waste on elevated platforms or within enclosed structures that are resistant to water. This ensures that waste doesn't come into contact with rainwater or surface runoff.
- **Impervious Flooring**: All waste storage and processing areas should have impervious flooring, such as concrete or sealed asphalt, which prevents any waste from leaking into the ground and contaminating runoff water.
- **Bunding and Containment Walls**: Construct bunds (raised barriers) or containment walls around storage areas to capture any spills or runoff from waste handling processes. These barriers should be designed to prevent waste or chemicals from flowing into drains or the natural environment.
- **Separation of Hazardous and Non-Hazardous Waste**: Maintain a strict segregation system for biomedical waste, ensuring hazardous materials are stored in isolated, secure, and sealed containers to prevent leaching during storms.

2. Storm Water Drainage System and Management

- **Interceptor Drains**: Install interceptor drains along the perimeter of the waste handling areas to direct any runoff water into a treatment system rather than allowing it to flow directly to surrounding environments. These drains should be designed to capture water before it interacts with contaminated waste.
- **Surface Water Diversion**: Implement surface water diversion systems that direct stormwater runoff away from hazardous waste zones and toward designated treatment or retention ponds.
- **Stormwater Filtration Systems**: Use sedimentation tanks, oil-water separators, and sand filters at the discharge points of stormwater runoff to remove any contaminants before the water enters nearby water reservoirs. This ensures that even small amounts of contaminants are filtered out.

3. Containment of Hazardous Materials

- **Double-Layered Waste Containers**: Use double-layered or secondary containment containers for the storage of hazardous biomedical waste. This prevents any potential leakage from reaching the stormwater system.
- **Leak Detection Systems**: Install leak detection systems in areas where liquids or chemicals might be stored to detect and manage any accidental spills before they can contaminate the environment.

- **Proper Labeling and Secure Waste Handling**: Ensure that all biomedical waste containers are properly labeled, sealed, and securely stored to avoid accidental spillage during handling and transport.

4. Erosion Control and Surface Runoff Prevention

- **Vegetative Cover and Landscaping**: Incorporate natural vegetation around the site's periphery and on slopes to prevent soil erosion, which can carry contaminants into surface runoff. Grass or ground covers should be used to stabilize soil and reduce runoff velocity.
- **Silt Fencing**: Install silt fences around the boundaries of the facility to capture and prevent sediment or hazardous materials from being carried by rainwater into nearby reservoirs.
- **Permeable Paving**: Use permeable materials in low-traffic areas to allow water to infiltrate the ground naturally, reducing surface runoff while avoiding the accumulation of contaminants on impervious surfaces.

5. Monitoring and Maintenance

- **Regular Inspection of Containment Systems**: Conduct frequent inspections of the containment barriers, waste storage units, and stormwater management infrastructure. This ensures that any potential weaknesses, such as cracks or blockages, are identified and repaired before causing an issue.
- **Routine Water Quality Testing**: Establish a routine water quality testing program for nearby water bodies (e.g., reservoirs, streams) to monitor for any contaminants, especially during or after storm events. This helps in identifying any issues early and taking corrective actions.
- **Maintenance of Drainage Infrastructure**: Regularly clean and maintain drains, filters, and separators to ensure that they remain effective in capturing and treating runoff water.

6. Spill Containment and Emergency Response Plans

- **Spill Response Protocols**: Implement clear and efficient spill response protocols, including the immediate containment of any hazardous materials, especially during storms. This could involve the use of absorbent materials, booms, or barriers to prevent contaminants from entering the stormwater system.
- **Secondary Containment Systems**: Ensure that secondary containment systems are in place in all critical areas (waste storage, treatment zones) to hold any spilled materials and prevent them from reaching stormwater drains.
- **Emergency Drains and Water Diversion**: In case of an emergency spill, temporary drainage systems or water diversion barriers can be quickly deployed to direct contaminated water to a designated containment area for proper treatment.

7. Training and Awareness Programs

- **Employee Training**: Ensure that all personnel are well-trained in proper waste handling, spill management, and emergency procedures to minimize the risk of contamination. This training should also include proper stormwater management practices, including how to contain or redirect runoff during adverse weather conditions.
- **Community Awareness**: For projects in proximity to communities or natural reserves, public awareness programs can help to promote safe practices and transparency regarding the project's environmental responsibility.

8. Retention and Treatment of Runoff

- **Retention Ponds or Basins**: Construct retention ponds that can temporarily store excess stormwater runoff, allowing it to be treated or naturally filtered before being released into the environment. These ponds can also serve as a last line of defense to capture runoff that might otherwise escape containment.
- **Treatment of Contaminated Stormwater**: If runoff is suspected to contain hazardous waste, it should be routed to a treatment facility for chemical neutralization, biological treatment, or filtration before discharge. This process helps prevent pollutants from entering nearby water bodies.

9. Regular Reporting and Documentation

- **Monitoring Records**: Maintain detailed records of stormwater runoff quality, inspection results, and any spill incidents or corrective actions taken. This documentation will serve to demonstrate compliance with environmental regulations and ensure transparency.
- **Environmental Audits**: Conduct periodic audits of the stormwater management system and the overall waste management protocols to identify areas for improvement and ensure that the facility is adhering to best environmental practices.

By implementing these precautionary measures, the **Biomedical Waste Handling Project** can significantly reduce the risk of contamination through surface runoff, protecting surrounding water reservoirs and natural ecosystems. The key is a comprehensive, proactive approach that combines effective design, rigorous maintenance, and thorough monitoring.

A **Standard Operating Protocol (SOP)** for managing the biomedical waste generated from a handling plant ensures that waste is collected, segregated, transported, treated, and disposed of in a safe, environmentally responsible, and compliant manner. Below is a detailed SOP for the entire process:

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1. Collection of Waste at Generation/Raw Material Point

1.1. Identification of Waste Generation Points

- Identify all potential waste generation points in the facility, including areas for raw material handling, treatment areas, storage rooms, and administration.
- Designate specific staff members for collecting and handling biomedical waste at these points.

1.2. Use of Appropriate Containers

- Ensure all biomedical waste is collected in color-coded, leak-proof, and puncture-resistant containers.
    - **Yellow Bags/Containers**: For infectious waste (e.g., bandages, gloves, etc.).
    - **Red Bags/Containers**: For plastic waste or contaminated non-recyclable items.
    - **Blue Bags/Containers**: For glass waste (e.g., vials, broken glass).
    - **Black Containers**: For general waste or waste that does not require special disposal.
- Label containers with the type of waste to avoid cross-contamination.

1.3. Safe Handling and Personal Protective Equipment (PPE)

- All personnel involved in the collection of biomedical waste should wear appropriate PPE, such as gloves, masks, gowns, and face shields, to prevent direct contact with hazardous materials.

1.4. Segregation at Point of Generation

- Segregate biomedical waste at the point of generation to minimize cross-contamination. Waste should be classified into categories (e.g., infectious, chemical, sharps, anatomical) and placed in the correct container immediately after use.
- Ensure that waste such as sharps (needles, scalpels, etc.) is placed in puncture-proof containers.

1.5. Documentation and Record-Keeping

- Maintain records of the waste generated, including the quantity and type of waste generated at each collection point. This helps with monitoring and compliance with local regulations.

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2. Segregation of Biomedical Waste

2.1. Segregation Process

- Segregate biomedical waste into different categories:
    - **Infectious Waste**: Items that may contain pathogens (e.g., bandages, surgical drapes).
    - **Sharps Waste**: Needles, syringes, scalpel blades, broken glass.
    - **Pharmaceutical Waste**: Expired or unused medications.
    - **Chemical Waste**: Chemicals, solvents, disinfectants.
    - **Anatomical Waste**: Human tissues or body parts.
    - **Non-hazardous Waste**: General office waste, packaging materials.
- This process must be done at the point of generation to avoid cross-contamination.

2.2. Color-Coding and Labeling

- Use color-coded bags and containers for each category of waste (e.g., yellow for infectious, blue for glass, etc.). Ensure that all containers are securely closed and clearly labeled.
- Ensure containers are tagged with the date of collection and facility information for traceability.

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3. Transportation of Biomedical Waste

3.1. Internal Transportation within the Facility

- Transport waste within the facility using dedicated carts, trolleys, or bins. These should be leak-proof, covered, and easy to clean.
- Ensure staff transporting waste are trained in safe handling and wear appropriate PPE.

3.2. External Transportation (From Facility to Disposal Site)

- **Transport Vehicles**: Use dedicated vehicles for transporting biomedical waste to the disposal or treatment facility. Vehicles should be:
    - Leak-proof.
    - Equipped with a closed compartment to prevent contamination during transit.
    - Properly labeled with warning signs related to hazardous waste transportation.
- **Packaging for Transport**: Ensure waste is securely packaged to prevent any accidental leakage or exposure.

- **Documentation**: Ensure proper documentation accompanies the transportation, including a waste manifest, details of waste type, quantity, and transportation route.

3.3. Personnel Handling and PPE

- Staff involved in transportation must wear full PPE, including gloves, masks, face shields, and protective clothing to minimize risk of exposure to hazardous materials.

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4. Treatment of Biomedical Waste

4.1. Methods of Treatment

- **Autoclaving (Steam Sterilization)**: This is one of the most common methods for treating infectious biomedical waste. The waste is subjected to high-pressure steam for a specified time to kill pathogens.
- **Incineration**: Used for highly hazardous, infectious, or pathological waste. Incinerators should be capable of achieving temperatures high enough to ensure complete destruction of waste (typically 850-1,100°C).
- **Microwave Treatment**: This process uses microwaves to sterilize waste by breaking down the waste's cellular structure.
- **Chemical Treatment**: For certain types of waste, such as pharmaceutical or chemical waste, chemical treatment may be used to neutralize harmful substances.

4.2. Treatment Protocols

- Set temperature, pressure, and duration parameters for each treatment method.
- Ensure that the treatment system is regularly maintained and undergoes calibration to ensure efficiency and compliance with health and safety standards.
- Maintain records of waste treatment, including batch numbers, treatment methods used, and the date and time of treatment.

4.3. Monitoring and Compliance

- Regularly monitor the performance of treatment systems (e.g., autoclaves, incinerators) and ensure they meet environmental and health regulations for emissions (e.g., air quality, waste residue disposal).

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5. Disposal of Biomedical Waste

5.1. Disposal of Non-Infectious Waste

- **General Waste**: Non-hazardous waste that does not pose an infection risk can be disposed of in municipal landfills or recycling centers following appropriate regulations.

- **Recyclable Materials**: Some materials (e.g., plastics, glass) should be sent to certified recycling facilities for disposal or recycling.

5.2. Disposal of Infectious or Hazardous Waste

- **Landfill Disposal**: If waste is non-recyclable but still non-toxic after treatment (e.g., sterilized waste), it may be disposed of in a designated hazardous waste landfill.
- **Final Treatment Residues**: After incineration or autoclaving, the remaining ashes or residues should be sent to a secure landfill for final disposal.
- **Chemical or Pharmaceutical Waste**: Hazardous waste should be disposed of in accordance with local or national guidelines for the disposal of chemicals or pharmaceuticals. This could involve neutralization, encapsulation, or disposal through certified hazardous waste disposal firms.

5.3. Documentation for Disposal

- Keep records of waste disposal, including the disposal method, final destination (e.g., landfill or recycling), and certifications of disposal. This ensures traceability and legal compliance.

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6. Training and Awareness

6.1. Staff Training

- Regular training programs should be conducted for all staff handling biomedical waste to ensure they are familiar with the SOP, waste segregation protocols, safety measures, and emergency response procedures.
- Training should include safe handling techniques, the use of PPE, and understanding the environmental and health risks of improper biomedical waste disposal.

6.2. Emergency Response Procedures

- In case of spills, leaks, or accidents, staff should be trained in emergency response, including containment, cleanup, and reporting incidents.
- Emergency kits (e.g., absorbents, neutralizing agents) should be available on-site for quick action.

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7. Record-Keeping and Documentation

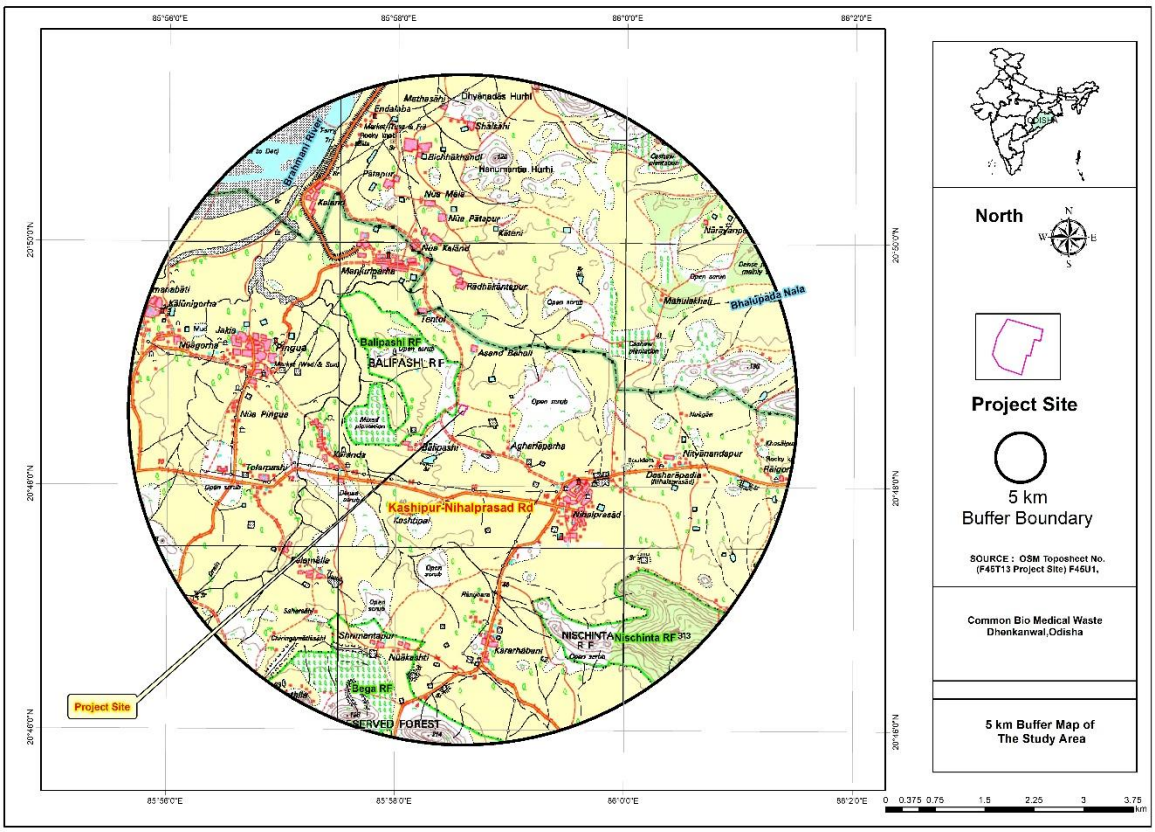
- Maintain detailed records for all steps, including collection, segregation, transportation, treatment, and disposal, to ensure traceability and compliance with regulations.
- Records should include:

- Waste generation log.
- Waste treatment and disposal certificates.
- Manifest records for waste transportation.
- Environmental impact assessments and compliance reports.

Conclusion

By implementing this **Standard Operating Protocol (SOP)** for biomedical waste handling, the facility ensures that the waste is collected, segregated, transported, treated, and disposed of in a safe and compliant manner. The SOP also focuses on reducing environmental and health risks, ensuring worker safety, and maintaining transparent documentation for regulatory compliance.

Annexure-XIV



When handling hazardous biomedical waste, it's crucial to implement a robust safety and health management system to protect employees working in the facility and the local communities surrounding the project. Below are Standard Operating Procedures (SOPs) and measures that should be followed to ensure the safety and health of all stakeholders:

1. Risk Assessment and Hazard Identification

- **Conduct a Risk Assessment**: Evaluate all aspects of biomedical waste handling, including collection, storage, transportation, treatment, and disposal processes. Identify potential hazards such as exposure to infectious agents, chemicals, sharps, and radiological waste.
- **Categorize Waste**: Classify the waste into categories (e.g., infectious, sharps, pharmaceutical, chemical) to determine appropriate handling procedures.

2. Employee Safety Measures

- **Personal Protective Equipment (PPE)**: Ensure that all employees handling hazardous biomedical waste are provided with appropriate PPE, including gloves, gowns, face shields, masks, and boots.
- **Training and Education**: Conduct regular training on hazardous waste management, infection control, and emergency response. Employees should be familiar with the proper handling techniques, disposal methods, and the use of PPE.
- **Hygiene Practices**: Implement strict hygiene practices such as handwashing, the use of disinfectants, and safe removal of contaminated PPE.
- **Waste Segregation**: Implement clear waste segregation protocols to prevent contamination and reduce exposure risks (e.g., separate bins for sharps, infectious waste, and chemical waste).
- **Labeling and Signage**: Properly label all waste containers with clear hazard symbols and handling instructions. Use color-coded containers to make waste segregation easier.

3. Handling and Transportation of Biomedical Waste

- **Waste Collection and Storage**: Designate secure, well-ventilated areas for the temporary storage of biomedical waste, ensuring that waste is kept in sealed containers to prevent exposure.
- **Safe Transportation**: Use specialized, sealed vehicles for transporting hazardous biomedical waste. Vehicles should be equipped with safety features to prevent leakage or spills.
- **Routes and Schedules**: Plan transportation routes that avoid densely populated areas to reduce exposure risks to the local community. Transport during off-peak hours when possible.

4. Treatment and Disposal Methods

- **Autoclaving and Incineration**: Implement approved treatment methods such as autoclaving for sterilization and incineration for the safe disposal of hazardous waste.
- **Monitoring and Validation**: Ensure regular monitoring of waste treatment processes to ensure they meet regulatory standards and effectively neutralize hazardous pathogens or chemicals.
- **Disposal**: Ensure the safe and environmentally compliant disposal of treated biomedical waste, including landfill disposal in authorized, lined, and controlled facilities.

5. Health Monitoring for Employees

- **Medical Surveillance**: Implement regular health check-ups and monitoring for employees exposed to hazardous waste. This includes baseline medical examinations and follow-up screenings for infections, respiratory issues, and other conditions.
- **Vaccination**: Provide necessary vaccinations (e.g., hepatitis B, tetanus) to employees working in hazardous waste handling environments.
- **Incident Reporting and Management**: Establish a system for reporting accidents, injuries, or exposures to hazardous waste. Ensure employees have access to immediate medical assistance in case of exposure.

6. Local Community Safety Measures

- **Community Awareness Programs**: Conduct awareness programs in nearby villages about biomedical waste risks and safety measures, focusing on recognizing hazardous waste and how to report any concerns.
- **Environmental Impact Monitoring**: Regularly monitor the environmental impact of the biomedical waste handling project on the local community, including air, water, and soil quality testing.
- **Buffer Zones**: Establish buffer zones between the biomedical waste handling facility and nearby residential areas to minimize the risk of exposure to hazardous waste.
- **Emergency Response Plans**: Develop and communicate emergency response plans to the local community in case of accidents such as leaks, spills, or fires at the facility. Provide contact information for emergency services and a clear action plan.

7. Emergency Response and Spill Management

- **Spill Containment Protocol**: Establish procedures for the immediate containment of spills, including the use of absorbent materials and special containment units.
- **Decontamination Procedures**: Ensure that all affected surfaces, equipment, and areas are decontaminated properly using disinfectants and sterilization methods.

- **First Aid and Medical Response**: Equip the site with first-aid kits and ensure that employees are trained in providing first aid. Maintain a system for immediate access to medical care for exposed individuals.
- **Incident Investigations**: Investigate all incidents of exposure or accidents to identify root causes and take corrective measures to prevent recurrence.

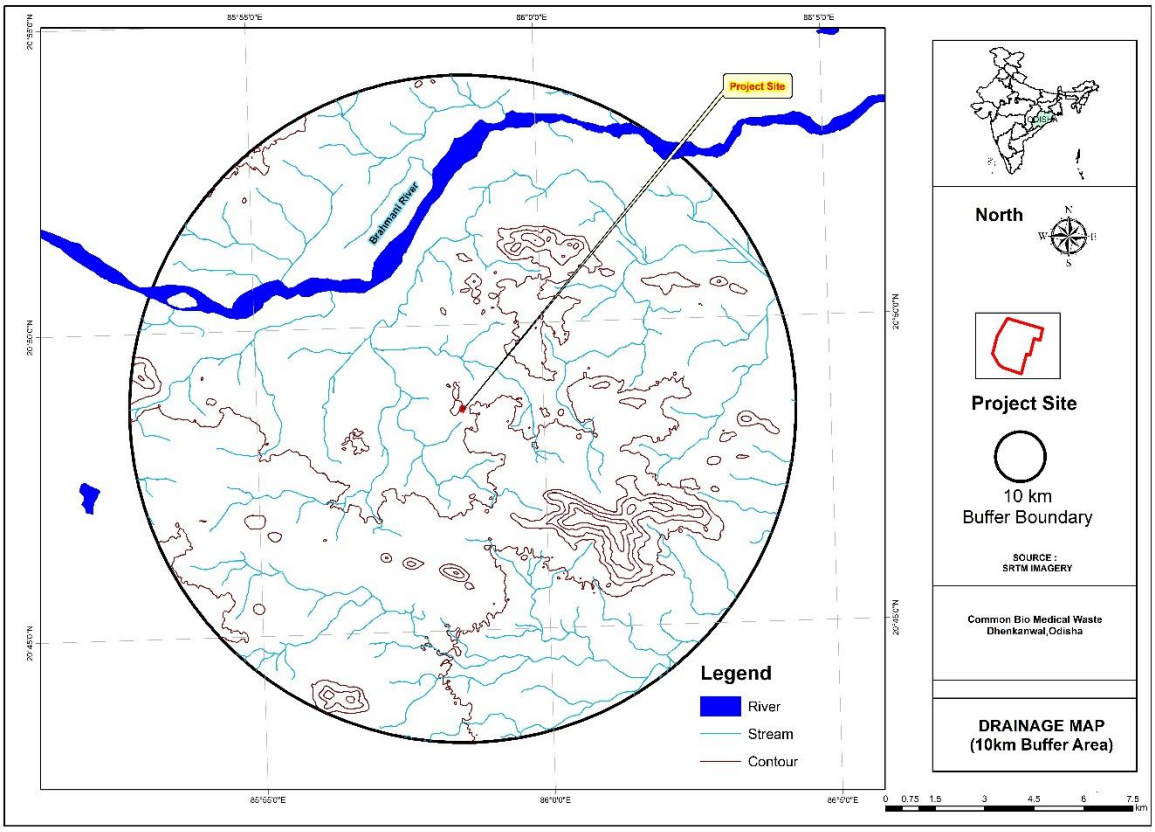
8. Regulatory Compliance and Documentation

- **Regulatory Requirements**: Ensure compliance with local, national, and international regulations related to the management of hazardous biomedical waste. Familiarize with the relevant laws, including the Basel Convention, WHO guidelines, and local waste management standards.
- **Record Keeping**: Maintain comprehensive records of waste handling activities, employee training, safety audits, and health monitoring data.
- **Audits and Inspections**: Conduct regular internal audits and inspections to assess adherence to safety standards and ensure continuous improvement in the waste handling process.

9. Public Communication and Feedback Mechanisms

- **Transparent Communication**: Provide clear, accessible information about the biomedical waste management project to local communities and stakeholders.
- **Complaint and Feedback Systems**: Establish a system for the public to report concerns or complaints regarding the biomedical waste handling operations. Ensure that concerns are addressed promptly and appropriately.

Annexure-VI


Project Site
Brahmani River
Legend
River
Stream
Contour
North
Project Site
10 km
Buffer Boundary
SOURCE :
SRTM IMAGERY
Common Bio Medical Waste
Dhenkanwal,Odisha
DRAINAGE MAP
(10km Buffer Area)
0 0.75 1.5 3 4.5 6 7.5
km