

IN THE HON'BLE NATIONAL GREEN TRIBUNAL**PRINCIPAL BENCH, NEW DELHI****APPEAL NO. 13/2023**

In the matter of:-

Indo Tech Waste Solution

... Appellant

Versus

Uttar Pradesh State Environment Impact

Assessment Authority Ors.

...Respondent(s)

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THROUGH



PRIYANKA SWAMI
ADVOCATE
COUNSEL FOR SIEAA, UP

To,

The Registrar,

Hon'ble National Green Tribunal

Copernicus Marg, New Delhi

Subject: WRITTEN SUBMISSIONS ON BEHALF OF SIEAA, UP IN APPEAL
NO. 13 OF 2023, INDO TECH WASTE SOLUTION vs. SIEAA, UP

Sir,

In compliance with the order date 09.02.2024 passed by the Hon'ble National Green Tribunal, New Delhi, in Appeal 13 of 2023, Indo Tech Waste Solution Management vs. SIEAA, the compliance written submissions are on behalf of SIEAA.

It is humbly requested that the said report be considered by you as per the directions of the Hon'ble Tribunal-wide order dated 09.02.2024, if it is necessary for further consideration then it may be taken before the Hon'ble Tribunal.

THROUGH



**PRIYANKA SWAMI
ADVOCATE
COUNSEL FOR SIEAA, UP**

**WRITTEN SUBMISSIONS WITH THE COMPLIANCE OF THE ORDER
PASSED THE HON'BLE TRIBUNAL DATED 09.02.2023**

That the State Level Environment Impact Assessment Authority (SEIAA), filed the written submissions in compliance with the order dated 09.02.2024, Upon hearing the present matter on 09.02.2024, the following directions were made by the Hon'ble National Green tribunal:

“ 1. Learned Counsel for appellant advanced submissions for some time and also drew our attention to Tribunal's order dated 20.10.2023 whereby SEIAA, UP was directed to produce original record leading to passing of order impugned in this Appeal within 10 days. However, no such record has been produced before us today. Learned Counsel appearing for the Appellant when sought to refer from original records, arguments could not proceed further since original record was not produced before us at all.

For non-compliance of Tribunal's order dated 20.10.2023 and thereby creating obstruction in today's hearing, we seriously deprecate the conduct and attitude of SEIAA, UP and direct Member Secretary, SEIAA, UP to appear in person along with original record as directed by order dated 20.10.2023 on the next date.

2. List for further hearing on 07.03.2024.

3. A copy of this order be forwarded to Member Secretary, SEIAA, UP by e-mail for compliance.”

1. That it is to respectfully submit that:

A. In the exercise of the powers conferred by Sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government notified the Bio-medical Waste Management Rules, 2016. **(Annexure-1)**

B. These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose of, or handle bio-medical waste in any form.

C. Rule 7(3) of Bio-Medical Waste Management Rules, 2016 provisions as follows:

“(3) No occupier shall establish on-site treatment and disposal facility if a service of common bio-medical waste treatment facility is available at a distance of seventy-five kilometre.”

D. Central Pollution Control Board has prepared guidelines for Common Bio-medical Waste Treatment and Disposal Facilities with an aim to have uniformity in ensuring site selection, allowing and establishment of CBWTF, operation as well as verification of compliance to the CBMWM Rules, 2016 throughout the country. **(Annexure-2)**

Under these guidelines,

I. At Sl. No. 2 **“Criteria for development of a new Common Bio-medical Waste Treatment and Disposal Facility”** following is prescribed:

“SPCB/PCC is required to conduct gap analysis w.r.to coverage area of the bio-medical waste generation and also projected over a period of next ten years, adequacy of existing treatment capacity of the CBWTF in each coverage area of radius 75 KM, as given in Annexure-I.”

II. At Sl. No. 8 “**Coverage area of CBWTF**”, the following is prescribed:

“Suggested coverage area for development of a CBWTF is as follows:

a) A CBWTF located within the respective State/UT shall be allowed to cater to healthcare units situated at a radial distance of 75 KM. However, in a coverage area where 10,000 beds are not available within a radial distance of 75 KM, existing CBWTF in the locality (located within the respective State/UT) may be allowed to cater the healthcare units situated up to 150 KM radius w.r.to its location provided the bio-medical waste generated is collected, treated and disposed of within 48 hours as stipulated under the BMWM Rules.

b) In case, several beds exceed >10,000 beds in a locality (i.e. coverage area of the CBWTF under reference) and the existing treatment capacity is not adequate, in such a case, a new CBWTF may be allowed in such a locality in compliance to various provisions notified under the Environment (Protection) Act, 1986, to cater services only to such additional bed strength of the HCFs located.”

2. The requirement for State Pollution Control Boards (SPCB) or Pollution Control Committees (PCC) to conduct a gap analysis concerning the coverage area of bio-medical waste generation, and its adequacy over the next ten years within a radius of 75 KM around Common Bio-Medical Waste Treatment Facilities (CBWTF), is a significant regulatory provision

aimed at ensuring environmental sustainability and public health safety. This directive entails a comprehensive evaluation of several critical aspects as follows:

I. Understanding Gap Analysis: Gap analysis, in this context, is a methodological approach to identify the current status of bio-medical waste management and project future needs. This involves assessing the volume of waste generated within specific areas and comparing it against the treatment capacities of existing facilities to identify any shortcomings or 'gaps' in service provision.

II. Coverage Area Consideration: The specification of a 75 KM radius for each CBWTF's coverage area aims to optimise the geographical reach of each facility, ensuring that bio-medical waste generated within this area can be efficiently transported and treated. This radius consideration helps in planning the distribution of facilities across a region to minimize transportation costs and environmental impacts associated with waste movement.

III. Bio-Medical Waste Generation Projections: Projecting bio-medical waste generation for the next ten years is essential for forward planning. This projection must take into account factors such as population growth, healthcare facility expansion,

changes in healthcare practices, and advancements in medical technology, which could all influence the quantity and characteristics of bio-medical waste generated.

3. Online Application seeking Terms of Reference for "Common Bio-Medical Waste Treatment Facility at Village-Kumroua, Block-Saron, Tehsil &, District- Kasganj Uttar Pradesh" was submitted on 12.02.2021 by the project proponent.

4. During the appraisal process of the project proposal "Common Bio-Medical Waste Treatment Facility at Village-Kumroua, Block-Saron, Tehsil &, District- Kasganj Uttar Pradesh" SEIAA, UP prescribed "Terms of Reference (TOR)" for preparation of Environment Impact Assessment Report and issued the same vide letter no. 93/Parya/SEIAA/6191/2021 dated 11.06.2021. Point number 10 of the TOR dated 11.06.2021 stipulated as follows:

"PROJECT PROPONENT /Consultant should provide the details of other bio-medical waste facilities within a 75 Km radius of the proposed site."

TOR dated 11-06-2021 is annexed as **Annexure-3**.

5. In compliance with the TOR dated 11-06-2021, the project proponent submitted an EIA report. In reply to point-10 of TOR as above, the following was submitted in the EIA report by the Project Proponent:

“There are **no other** biomedical waste treatment facilities **within a 75 km** radius of the proposed site. As per the guideline of CPCB, one CBWTF facility will cover a 75 km area and 10000 beds. Nearby CBMWTF are Mathura, Agra, Shajahanpur and Mainpuri each Facility is at a distance of 92KM, 92KM, and 89KM respectively from the project site. Details of the nearest biomedical waste facility of the proposed site are given in Table No. 1.4 of Chapter 1.”

6. That it is respectfully submitted that SEIAA, UP inquired about the complaint made by M/s Punarchakran Pvt. Ltd. against the project "Common Bio-Medical Waste Treatment Facility at Village-Kumroua, Block-Saron, Tehsil &, District-Kasganj Uttar Pradesh” from UPPCB. Member Secretary, UPPCB vide letter dated 20.02.2023 categorically mentioned that the distance of CBMWTF of M/s Punarchakran Pvt Ltd situated at Babrala, Sambhal is at a distance of about 40 Km from the CBMWTF proposed at District-Kasganj as above.

7. That SEIAA, UP on the basis of the above report submitted from UPPCB, who is the “Prescribed Authority” under “Common Bio-Medical Waste Management Rules,2016” found the information provided by the project proponent in its EIA report to be incorrect and misleading and rejected the application for Environmental Clearance.

8. As the State Environmental Impact Assessment Authority (SEIAA), it is imperative to clarify that while the term "gap analysis" is not explicitly mentioned in the EIA notification, 2006, it is inclusive and crucial in the guidelines for Common Bio-Medical Waste Treatment Facility prescribed by the Central Pollution Control Board (CPCB) in continuation of the Common Bio-Medical Waste Management Rules 2016 of Central Government. This implicit integration of gap analysis ensures that all aspects of environmental impact, including those

not directly mentioned in EIA Notification, 2006 (as amended), but inherent to the regulations and guidelines the Central Government adhere to, are rigorously evaluated. Moreover, the integrity and accuracy of the information provided by the Project Proponent (PP) remain paramount in the EIA process. Our evaluation process implicitly encompasses the verification of the PP's submissions against the reports and findings of the Pollution Control Board (PCB). This cross-verification is crucial because any discrepancies, particularly those highlighted in the PCB's report, could undermine the validity of the entire assessment process. If the information furnished by the PP deviates from the findings reported by the PCB, it compromises the foundation upon which EIA is built. Consequently, maintaining the accuracy of the PP's information is not only a matter of procedural compliance but a fundamental prerequisite to ensure the integrity and reliability of the environmental assessment process.

9. That the Environment Impact Assessment report is a crucial and integral part of the Environmental clearance process. Environment clearance also serves as a siting clearance, assessing whether the proposed location is environmentally compatible and sound for the project. Although the term "gap analysis" does not explicitly appear in the application form for clearance, there are other procedural aspects that lead to similar outcomes. One such procedure is the Terms of Reference (TOR), under which the State Expert Appraisal Committee (SEAC) is required to pose siting-related queries. The responses provided by the project proponent (PP) play a crucial role, as the Authority's decision is based on these replies. It is the responsibility of the Project Proponent to ensure that the answers/compliances to these queries are accurate and truthful. However, the information provided by the project proponent regarding the distance from other Common Bio-Medical Waste Treatment Facilities (CBMWTF) was found to be

false and misleading, as evidenced by the report from the Pollution Control Board (PCB). This discrepancy revealed that the application/EIA report contained false facts concerning the proximity to existing CBMWTFs. Consequently, due to the submission of incorrect information, which is a critical component of the environmental clearance process, the application for environmental clearance was rejected.

PRAYER

It is, therefore, most respectfully prayed that this Hon'ble Tribunal may graciously be pleased to:

- I. take the above averments on record as the compliance written submissions by SIEAA.
- II. Pass any such other order as may deem fit.

THROUGH



**PRIYANKA SWAMI
ADVOCATE
COUNSEL FOR SIEAA, UP**



भारत का राजपत्र The Gazette of India

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (i)

PART II—Section 3—Sub-section (i)

प्राधिकार से प्रकाशित

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अधिसूचना

नई दिल्ली, 28 मार्च, 2016

सा.का.नि. 343(अ).—भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना संख्यांक का.आ. 630(अ), तारीख 20 जुलाई, 1998 की अधिसूचना द्वारा जैव चिकित्सा अपशिष्ट (प्रबंधन और हथालन) नियम, 1998 के माध्यम से देश में उत्पन्न जैव चिकित्सा अपशिष्ट के प्रबंधन के लिए एक विनियामक ढांचे का उपबंध किया गया था;

और इन नियमों को अधिक प्रभावी रूप से कार्यान्वित करने और पर्यावरण की दृष्टि से बेहतर प्रबंधन में संग्रहण, पृथक्करण, प्रसंस्करण, परिष्करण और निपटान में सुधार करने के लिए, जिससे जैव-चिकित्सा अपशिष्ट कम उत्पन्न हो और पर्यावरण पर कम प्रभाव पड़े, केन्द्रीय सरकार ने विद्यमान नियमों की समीक्षा की है;

और पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 6, 8 और 25 का प्रयोग करते हुए केन्द्र सरकार ने सा.का.नि.सं.450(अ), दिनांक 03 जून, 2015 के तहत राजपत्र में प्रारूप नियम प्रकाशित किए थे जिसमें जैव-चिकित्सा अपशिष्ट (प्रबंधन और हथालन), नियम, 1998 के अधिक्रमण में जैव-चिकित्सा (प्रबंधन और प्रहस्तन), नियम 2015 पर उक्त अधिसूचना के प्रकाशन की तारीख से साठ दिन के अंदर जनता से आपत्तियां अथवा सुझाव आमंत्रित किए गए थे;

उक्त प्रारूप नियम निहित राजपत्र की प्रतियां दिनांक 03 जून, 2015 को जनता को उपलब्ध करा दी गई थीं;

और उक्त प्रारूप नियम के संबंध में निर्धारित अवधि के अंदर जनता से प्राप्त आपत्तियों अथवा टिप्पणियों पर केन्द्रीय सरकार द्वारा विधिवत विचार किया गया है;

अब, इसलिए, पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 6, 8 और 25 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और जैव-चिकित्सा अपशिष्ट (प्रबंधन और हथालन) नियम, 1998 का अधिक्रमण करते हुए केन्द्रीय सरकार एतद्वारा जैव-चिकित्सा अपशिष्ट के प्रबंधन के लिए निम्नलिखित नियम अधिसूचित करती है :-

1. **संक्षिप्त नाम और प्रारंभ.-** (1) इन नियमों का संक्षिप्त नाम जैव-चिकित्सा अपशिष्ट प्रबंधन नियम, 2016 है।
- (2) ये राजपत्र में प्रकाशन की तारीख को प्रवृत्त होंगे।
2. **लागू होना.-**
 - (1) ये नियम अस्पतालों, नर्सिंग होम, क्लिनिकों, औषधालयों, पशु चिकित्सा संस्थाओं, पशु गृहों, पैंथेलाॅजिकल प्रयोगशालाओं, रक्त बैंकों, आयुष अस्पतालों, क्लिनिकल स्थापनाओं, अनुसंधान या शैक्षिक संस्थाओं, स्वास्थ्य शिविरों, चिकित्सा अथवा शल्यचिकित्सा कैंपों, टीकाकरण कैंपों, रक्तदान कैंपों, विद्यालयों के प्रथम चिकित्सा कक्षों, अदालती प्रयोगशालाओं और अनुसंधान प्रयोगशालाओं सहित उन सभी व्यक्तियों पर लागू होंगे, जो किसी भी रूप में जैव चिकित्सा अपशिष्ट का उत्पादन, संग्रहण, ग्रहण, भंडारण, परिवहन, शोधन, व्ययन या प्रहस्तन करते हैं।
 - (2) ये नियम निम्नलिखित पर लागू नहीं होंगे :
 - (क) रेडियोधर्मी अपशिष्ट जो परमाणु ऊर्जा अधिनियम, 1962 (1962 का 33) और उसके अधीन बनाए गए नियमों के उपबंधों के अधीन आते हैं;
 - (ख) अधिनियम के अंतर्गत बनाए गए परिसंकटमय रसायन विनिर्माण, भंडारण और आयात नियम, 1989 में शामिल परिसंकटमय रसायन;
 - (ग) अधिनियम के अधीन बनाए गए नगरीय ठोस अपशिष्ट (प्रबंधन और हथालन) नियम, 2000 के अधीन आने वाले ठोस अपशिष्ट;
 - (घ) अधिनियम के अधीन बनाए गए बैटरी (प्रबंधन और हथालन) नियम, 2001 के अधीन आने वाली लैड एसिड बैटरियां;
 - (ङ.) अधिनियम के अधीन बनाए गए परिसंकटमय अपशिष्ट (प्रबंधन, हथालन और सीमापारीय संचालन) नियम, 2008 के अधीन आने वाले परिसंकटमय अपशिष्ट।
 - (च) अधिनियम के अधीन बनाए गए ई-अपशिष्ट (प्रबंधन और हथालन) नियम, 2011 के अधीन आने वाला अपशिष्ट; और
 - (छ) अधिनियम के अधीन बनाए गए परिसंकटमय सूक्ष्मजीवों का विनिर्माण, उपयोग, आयात, निर्यात और भंडारण, अनुवांशिक रूप से तैयार किए गए सूक्ष्मजीव या कोशिका नियम, 1989 के अधीन आने वाले परिसंकटमय सूक्ष्मजीव, अनुवांशिक रूप से तैयार किए गए सूक्ष्म जीव और कोशिकाएं।
3. **परिभाषाएं.-** इन नियमों में, जब तक कि संदर्भ में अन्यथा अपेक्षित न हो -
 - (क) "अधिनियम" से पर्यावरण (संरक्षण) अधिनियम 1986 (1986 का 29) अभिप्रेत है;
 - (ख) "पशु गृह" से ऐसा स्थान अभिप्रेत है जहां जीव जंतुओं को अनुसंधान या परीक्षण के प्रयोजनों के लिए पशुओं का पालन-पोषण किया जाता है/रखा जाता है;

- (ग) "प्राधिकरण" से इन नियमों और यथास्थिति, भारत सरकार अथवा केन्द्रीय प्रदूषण नियंत्रण बोर्ड, द्वारा जारी मार्गदर्शन सिद्धांतों के अनुसार जैव चिकित्सा अपशिष्ट के उत्पादन, संग्रहण, ग्रहण, भंडारण, परिवहन, उपचार व्ययन और/या किसी भी अन्य प्रकार के हथालन के लिए विहित प्राधिकारी द्वारा प्रदान की गई अनुमति अभिप्रेत है;
- (घ) "प्राधिकृत व्यक्ति" से इन नियमों और यथास्थिति, केन्द्रीय सरकार या केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा बनाए गए नियमों और जारी किए गए मार्गदर्शक सिद्धांतों के अनुसार जैव चिकित्सा अपशिष्ट के जनन, संग्रहण, ग्रहण, भंडारण, परिवहन, उपचार, व्ययन और/या किसी भी अन्य प्रकार के हथालन हेतु, के लिए विहित प्राधिकारी प्राधिकृत कोई अधिभोगी या प्रचालक अभिप्रेत है।
- (ङ.) "जैविक" से जीवों या सूक्ष्मजीवों का उपापचय या जैव रासायनिक प्रतिक्रियाओं के उत्पादों से बनाई गई विनिमित्तियां जो मानवों या पशुओं के निदान प्रतिरक्षण या शोधन में या उससे संबंधित अनुसंधान कार्यकलापों में उपयोग के लिए आशयित है;
- (च) "जैव चिकित्सा अपशिष्ट" से कोई ऐसा अपशिष्ट अभिप्रेत है, जिसका जनन मानवों या पशुओं के निदान, शोधन या प्रतिरक्षण के दौरान या उससे संबंधित अनुसंधान कार्यकलापों या जैविकीय उत्पादन या परीक्षण में विभिन्न स्वास्थ्य केंद्रों में जिसके अधीन इन नियमों की अनुसूची-1 में उल्लिखित प्रवर्ग भी है, के दौरान हुआ है;
- (छ) "जैव चिकित्सा अपशिष्ट शोधन और व्ययन सुविधा" से कोई ऐसी सुविधा अभिप्रेत है जिसमें जैव चिकित्सा अपशिष्ट का शोधन, व्ययन या ऐसे शोधन और व्ययन से आनुवंशिक प्रक्रियाएं की जाती हैं और इसमें सामान्य जैव-चिकित्सा शोधन सुविधाएं भी सम्मिलित हैं;
- (ज) "प्ररूप" से इन नियमों में संलग्न प्ररूप अभिप्रेत है;
- (झ) जैव-चिकित्सा अपशिष्ट के संबंध में "हथालन" से अभिप्रेत है ऐसे अपशिष्ट का जनन, छंटनी, पृथक्करण, संग्रहण, उपयोग, भंडारण, पैकेजिंग, लदान, परिवहन, उतराई, प्रसंस्करण, शोधन, नष्ट करना, रूपांतरण, बिक्री के लिए प्रस्तुत करना, स्थानान्तरण, निपटान और इसी प्रकार के कार्य;
- (ञ) "स्वास्थ्य देखभाल सुविधा" एक ऐसा स्थान है जहां मानवों अथवा पशुओं का निदान, उपचार या प्रतिरक्षण किया जाता है, स्वास्थ्य उपचार प्रणाली का स्वरूप और आकार तथा उससे संबंधित अनुसंधान कार्यकलाप चाहे जो भी हो;
- (ट) "भारी दुर्घटना" से अभिप्राय जैव-चिकित्सा अपशिष्ट का हथालन करते समय होने वाली ऐसे दुर्घटना से है जिसका बड़ी संख्या में आम जनता पर प्रभाव पड़ सकता है जैसे कि जैव-चिकित्सा अपशिष्ट ले जा रहे ट्रक का पलट जाना, जैव-चिकित्सा अपशिष्ट का दुर्घटनावश किसी जल निकाय में चले जाना आदि जिसमें सूई से लगने वाली जैसी चोट पारे का हुलकन दुर्घटनाएं शामिल नहीं हैं।
- (ठ) "प्रबंधन" में वे सभी उपाय शामिल होते हैं जो यह सुनिश्चित करने के लिए अपेक्षित होते हैं कि जैव-चिकित्सा अपशिष्ट का प्रबंधन इस ढंग से किया जाए जिससे ऐसे अपशिष्ट के हथालन की वजह से होने वाले किसी प्रतिकूल प्रभाव से स्वास्थ्य और पर्यावरण की रक्षा हो सके;
- (ड) "अधिभोगी" से ऐसा व्यक्ति अभिप्रेत है जिसका जैव चिकित्सीय अपशिष्ट को उत्पन्न करने वाली संस्था और परिसर पर प्रशासनिक नियंत्रण हो, जिनमें उनकी औषधि की प्रणाली तथा जिसे चाहे किसी भी नाम से पुकारा जाता हो अस्पताल, नर्सिंग होम, क्लीनिक, औषधालय, पशु चिकित्सा संस्थाएं, पशु गृह, पैथोलॉजिकल प्रयोगशालाएं, ब्लड बैंक, स्वास्थ्य देखभाल सुविधाएं तथा क्लीनिकल स्थापनाएं शामिल हैं;

- (ढ) "किसी साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा के प्रचालक" से ऐसा कोई व्यक्ति अभिप्रेत है जो जैव चिकित्सा अपशिष्ट के संग्रहण, ग्रहण, भंडारण, परिवहन, शोधन, व्ययन या किसी भी प्रकार के हथालन हेतु किसी साझा सुविधा का स्वामी है या उसे नियंत्रित करता है;
- (ण) "विहित प्राधिकारी" से अभिप्रेत है राज्यों के मामले में राज्य प्रदूषण नियंत्रण बोर्ड और संघ राज्य क्षेत्रों के मामले में प्रदूषण नियंत्रण समितियां।
- (त) "अनुसूची" से इन नियमों से उपाबद्ध अनुसूची अभिप्रेत है।
4. **अधिभोगी के कर्तव्य.**— प्रत्येक अधिभोगी का कर्तव्य होगा कि :
- (क) यह सुनिश्चित करने के लिए सभी उपाय करे कि जैव चिकित्सा अपशिष्ट का हथालन मानव स्वास्थ्य और पर्यावरण पर कोई प्रतिकूल प्रभाव डाले बिना और इन नियमों के अनुसार हो;
- (ख) अपने परिसर के अंदर अनुसूची-1 के अनुसार रंग वाले बैगों या पात्रों में पृथक किए गए जैव-चिकित्सा अपशिष्ट के भंडारण के लिए सुरक्षित, संवातित और संरक्षित स्थान की व्यवस्था करना ताकि कोई गौण हथालन न हो, पुनःचक्रण योग्य सामग्री भूषण न हो या अनवधानता से छितराया न हो या पशुओं द्वारा बिखराया नहीं जाए और ऐसे स्थान या परिसर से जैव चिकित्सा अपशिष्ट को इन नियमों में विहित तरीके से सीधे साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा के लिए या समुचित शोधन और निपटान के लिए अनुसूची-1 में यथा विहित रीति, जैसा भी मामला भेजा जाना जाएगा।
- (ग) विश्व स्वास्थ्य संगठन (डब्ल्यूएचओ) या राष्ट्रीय एड्स नियंत्रण संगठन (एनएसीओ) के मार्गदर्शक सिद्धांतों के अनुसार प्रयोगशाला अपशिष्ट, माइक्रोबायोलॉजिकल अपशिष्ट, रक्त के नमूनों और रक्त की थैलियों का विसंक्रमण अथवा जीवाणुनाशन के जरिए स्थल पर पूर्व-शोधन करेगा और उसके बाद अंतिम निपटान के लिए साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा में भेजेगा;
- (घ) अधिसूचना की तारीख से दो वर्ष के अंदर क्लोरीनेटेड प्लास्टिक की थैलियों, दस्तानों और रक्त की थैलियों का उपयोग बंद करना;
- (ङ.) जैव-चिकित्सा अपशिष्ट से भिन्न अन्य ठोस अपशिष्ट का निपटान सुसंगत और समय-समय पर यथा संशोधित विधियों में अधीन बनाये गये संबंधित अपशिष्ट प्रबंधन नियमों के उपबंधों अनुसार करना;
- (च) उपचारित जैव चिकित्सा अपशिष्ट को नगरीय ठोस अपशिष्ट के साथ नहीं देना;
- (छ) जैव चिकित्सा अपशिष्ट के हथालन में अन्तर्वलित कर्मकारों और अन्यो के स्वास्थ्य की देखभाल के लिए उन्हें भर्ती करने के समय और उसके बाद कम से कम वर्ष में एक बार प्रशिक्षण देना। आयोजित किए प्रशिक्षण कार्यक्रमों, प्रशिक्षित किए गए कर्मिकों की संख्या और कोई प्रशिक्षण न लेने वाले कर्मिकों की संख्या के ब्यौरे उपलब्ध कराना और उसे वार्षिक रिपोर्ट में शामिल करना;
- (ज) प्रतिरक्षण नीति अथवा स्वास्थ्य और परिवार कल्याण मंत्रालय द्वारा समय-समय पर जारी मागदर्शक सिद्धांतों में यथा विहित रीति से हेपेटाइटिस बी और टिटनेस सहित उन रोगों से जैव चिकित्सा अपशिष्ट से हथालन में अन्तर्वलित स्वास्थ्य देखभाल कर्मकारों या अन्यो को बचाने के लिए जो जैव-चिकित्सा अपशिष्ट के हथालन के कारण संक्रमित हो सकते हैं;
- (झ) इन नियमों के अधीन अधिसूचना की तारीख से एक वर्ष के अंदर किसी भी प्रयोजन के लिए परिसर या स्थान से बाहर भेजे जाने वाले जैव-चिकित्सा अपशिष्ट अन्तर्विष्ट वाले बैगों या आघानों के लिए बार-कोड प्रणाली की स्थापना करना;

- (ज) जनन बिन्दु पर द्रव रसायन अपशिष्ट का पृथक्करण सुनिश्चित करना और स्वास्थ्य देखभाल सुविधा से जनित अन्य बहिःस्राव के साथ मिश्रित होने से पहले पूर्व-शोधन या निष्प्रभावण सुनिश्चित करना;
- (ट) जल (प्रदूषण निवारण और नियंत्रण) अधिनियम, 1974 (1974 का 6) के अनुसार द्रव अपशिष्ट का शोधन और निपटान सुनिश्चित करना;
- (ठ) समुचित और पर्याप्त व्यक्तिगत संरक्षणकारी उपस्कर प्रदान करके जैव-चिकित्सा अपशिष्ट के हथालन में अन्तर्वलित अपने सभी स्वास्थ्य देखभाल कर्मकारों और अन्यो की वृत्तिक सुरक्षा सुनिश्चित करना।
- (ड) जैव चिकित्सा अपशिष्ट के हथालन में अंतर्वलित अपने सभी स्वास्थ्य देखभाल कर्मकारों और अन्य की भर्ती करते समय और वर्ष में कम से कम एक बार स्वास्थ्य जांच आयोजित करना और उसका रिकॉर्ड रखना।
- (ढ) जनित जैव चिकित्सा अपशिष्ट की श्रेणी, रंग कोड के अनुसार अनुसूची-1 में यथा और अनुरक्षित विनिर्दिष्ट जैव चिकित्सा अपशिष्ट के प्रबंध का रजिस्टर रखना और इसे प्रतिदिन अद्यतन और अनुरक्षित करना तथा अपनी वेबसाइट पर मासिक रिकॉर्ड प्रदर्शित करना;
- (ण) जैव चिकित्सा अपशिष्ट के हथालन के दौरान अग्नि संकट, विस्फोट जैसी दुर्घटनाओं सहित प्रमुख दुर्घटनाओं और की गई उपचारात्मक कार्रवाई की सूचना प्ररूप 1 में (शून्य सूचना सहित) विहित प्राधिकारी को और साथ ही वार्षिक रिपोर्ट के साथ भी दी जाएगी।
- (त) वार्षिक रिपोर्ट अपनी वेबसाइट पर उपलब्ध कराएगा और सभी स्वास्थ्य देखभाल सुविधाएं इन नियमों की अधिसूचना की तारीख से दो वर्ष के अंदर अपनी वेबसाइट बनाएंगे।
- (थ) यदि किसी सुविधा का प्रचालक अभिप्रेत समय के अंदर या सहमत समय के अनुसार जैव चिकित्सा अपशिष्ट का संग्रहण नहीं करता तो तत्काल विहित प्राधिकारी को सूचित करना।
- (द) वर्तमान समिति के माध्यम से अथवा नई समिति बनाकर जैव-चिकित्सा अपशिष्ट प्रबंध से संबंधित कार्यकलापों की समीक्षा का पुनरावलोकन मॉनीटरिंग करने के लिए एक प्रणाली की स्थापना करना। यह समिति छह माह में एक बार बैठक करेगी। इस समिति की बैठकों के कार्यवृत्त का रिकॉर्ड वार्षिक रिपोर्ट के साथ विहित प्राधिकारी को प्रस्तुत किया जाएगा। तीस विस्तारों से वाली स्वास्थ्य देखभाल स्थापनाएं अपनी स्थापना के अंदर जैव-चिकित्सा अपशिष्ट प्रबंध से संबंधित कार्यकलापों का पुनरावलोकन और मॉनीटरिंग करने के लिए एक सुयोग्य व्यक्ति पदानिहित करेंगी और वार्षिक रिपोर्ट प्रस्तुत करेंगी।
- (ध) भस्मीकरण, हाइड्रो या ऑटोक्लेविंग आदि के प्रचालन का समस्त रिकॉर्ड पांच वर्ष तक रखना।
- (न) इस अधिसूचना की तारीख से दो वर्ष के भीतर द्वितीय चैम्बर और डाईआक्सीजन तथा फुरान के बचाए रखने के समय के लिए अनुसूची 2 में यथा विहित जैव चिकित्सा अपशिष्टों के उपचार और निपटान के लिए मानकों को प्राप्त करने के लिए विद्यमान भस्मन यंत्र।
5. **साक्षा-जैव चिकित्सा अपशिष्ट उपचार और निपटान सुविधा प्रचालक के कर्तव्य.-** प्रत्येक प्रचालक का यह कर्तव्य होगा कि वह -
- (क) यह सुनिश्चित करने के लिए सभी आवश्यक कदम उठाए कि अधिभोगी से संग्रहित जैव चिकित्सा अपशिष्ट का परिवहन हथालन, भंडारण, उपचार और व्ययन इन नियमों के अनुसार और केन्द्रीय सरकार या जैसा भी मामला हो केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा जारी मार्गदर्शक सिद्धांतों के अनुसार मानव स्वास्थ्य और पर्यावरण पर प्रतिकूल प्रभाव डाले बिना किया जा रहा है;
- (ख) इन नियमों के अधीन यथा विहित अधिभोगी से समय से जैव चिकित्सा अपशिष्ट का एकत्रण को सुनिश्चित करना;
- (ग) जैव-चिकित्सा अपशिष्ट के हथालन के लिए एक वर्ष के अंदर बार-कोडिंग और ग्लोबल प्रोजेक्शनिंग प्रणाली लगाना;

- (घ) उन अधिभोगियों के संबंध में, जो इन नियमों के अनुसार पृथक किए गए जैव चिकित्सा अपशिष्ट को सौंप नहीं हो रहे हों, विहित प्राधिकारी को तत्काल सूचित करना।
- (ङ.) जैव चिकित्सा अपशिष्ट के हथालन में अन्तर्वर्लित अपने सभी कर्मकारों को उनको भर्ती और तत्पश्चात वर्ष में कम से कम एक बार प्रशिक्षण प्रदान करे।
- (च) जैव चिकित्सा अपशिष्ट प्रबंधन के लिए उनके द्वारा आयोजित प्रशिक्षण में अधिभोगी की सहायता करना।
- (छ) जैव चिकित्सा अपशिष्ट के हथालन में संक्रमण की आशंका वाले रोगों, जिनमें हैपेटाइटिस बी और टिटनेस शामिल हैं, के बचाव हेतु जैव चिकित्सा अपशिष्ट के हथालन में अन्तर्वर्लित अपने सभी कर्मकारों की समुचित ढंग से तैनाती पूर्व चिकित्सा जांच और कम से कम वर्ष में एक बार चिकित्सा जांच और प्रतिरक्षण करवाना जिनके जैव चिकित्सा अपशिष्ट के हथालन के दौरान फैलने की संभावना है तथा उसके अभिलेख का अनुरक्षण करना;
- (ज) जैव चिकित्सा अपशिष्ट के हथालन में अंतर्वर्लित अपने सभी कर्मकारों को समुचित और पर्याप्त व्यक्तिगत संरक्षणकारी उपस्कर प्रदान करते हुए उनकी वृत्तिक सुरक्षा सुनिश्चित करना;
- (झ) जैव चिकित्सा अपशिष्ट के हथालन के दौरान अग्नि संकट, विस्फोट जैसी दुर्घटनाओं सहित प्रमुख दुर्घटनाओं और की गई उपचारात्मक कार्रवाई की सूचना प्ररूप 1 में (शून्य सूचना सहित) विहित प्राधिकारी को और साथ ही वार्षिक रिपोर्ट भी दी जाएगी।
- (ञ) अपने प्रत्येक उपचार उपस्कर के लिए बैच के भार, उपचारित अपशिष्ट की श्रेणियों, शोधन चक्र के समय, तारीख और अवधि तथा प्रचालन के कुल घंटों के अनुसार एक लागू बुक रखना।
- (ट) जो अधिभोगी प्रचालक को शोधन के लिए अपशिष्ट दे रहे हैं, उन्हें यह देखने की अनुमति देना कि उपचार नियमों के अनुसार किया गया है;
- (ठ) प्राधिकरण उपचार, वार्षिक रिपोर्ट आदि के ब्यौरे अपनी वेबसाइट पर प्रदर्शित करेगा।
- (ड) विकृत कर दिए जाने या कतरन बना दिए जाने के बाद, जो भी लागू होता हो, ऑटोक्लेविंग या माइक्रोवेविंग द्वारा शोधन सुनिश्चित करने के बाद शोधित जैव-चिकित्सा अपशिष्टों में से पुनःचक्रण योग्य पदार्थों को, जैसे कि प्लास्टिक और शीशा आदि, ऐसे पुनः चक्रणकर्ताओं को दिया जाएगा जिनके पास संबंधित राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति की विधिमान्य सहमति, प्राधिकार या रजिस्ट्रीकरण हो;
- (ढ) यदि अपेक्षित हो तो अधिभोगी को प्रभार्य आधार पर गैर-क्लोरीनेटेड प्लास्टिक की रंगीन थैलियों की आपूर्ति करेगा।
- (ण) साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा छुट्टी के दिन भी जैव-चिकित्सा अपशिष्ट का संग्रहण सुनिश्चित करेगी।
- (त) भस्मन यंत्र, हाइड्रूर ऑटोक्लेविंग के प्रचालन का समस्त रिकॉर्ड पांच वर्ष की अवधि तक रखेगा।
- (थ) सेकेंड्री चैम्बर और डाइऑक्सीजन और फुरान में बनाए रखने के मानक प्राप्त करने के लिए विद्यमान भस्मन यंत्रों का उन्नयन इस अधिसूचना की तारीख से दो वर्ष के अंदर करेगा।

6. **प्राधिकारियों के कर्तव्य.-** अनुसूची-III के स्तंभ (2) में विनिर्दिष्ट प्राधिकारी इन नियमों के उपबंधों के अनुसार उक्त अनुसूची के स्तंभ (3) में यथा-विनिर्दिष्ट कर्तव्यों का पालन करेगा।

7. **उपचार और व्ययन.-** (1) स्वास्थ्य अनुरक्षण सुविधा और साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा द्वारा जैव चिकित्सा अपशिष्ट का शोधन और व्ययन अनुसूची-I के अनुसार और अनुसूची-2 में उपबंधित मानकों के अनुपालन में किया जाएगा।

- (2) अधिभोगी अनुसूची-I के अनुसार पृथक किए गए अपशिष्ट को उपचारित, प्रसंस्करण और अंतिम निपटान के लिए साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा को सौंपेगा :
परन्तु यह कि प्रयोगशाला और उत्पन्न होने वाले अत्यधिक संक्रमित जैव-चिकित्सा अपशिष्ट का ऑटोक्लेव या माइक्रोवेव जैसे उपस्कर द्वारा पूर्व-शोधन किया जाए।
 - (3) कोई भी अधिभोगी स्थल पर शोधन और निपटान सुविधा स्थापित नहीं करेगा, यदि साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा पचहत्तर कि.मी. की दूरी पर उपलब्ध है।
 - (4) जिस मामले में साझा जैव चिकित्सा अपशिष्ट शोधन की सेवा उपलब्ध नहीं है उसमें अपना प्रचालन प्रारम्भ करने से पूर्व अधिभोगी विहित प्राधिकारी द्वारा दिए गए प्राधिकार के अनुसार भस्मन यंत्र, ऑटोक्लेव या माइक्रोवेव, श्रेडर जैसे अपेक्षित जैव-चिकित्सा अपशिष्ट शोधन उपकरण स्थापित करेगा।
 - (5) किसी साझा जैव-चिकित्सा अपशिष्ट शोधन सुविधा के अधिभोगी या प्रचालक सहित कोई भी व्यक्ति जिसका जैव-चिकित्सा अपशिष्ट के उपचार हेतु अनुसूची-I में सूचीबद्ध से भिन्न उपचार की नई प्रौद्योगिकियों का उपयोग करने का आशय है, वह केन्द्रीय सरकार से मानकों या प्राचलित प्राचलों के निर्धारण हेतु अनुरोध करेगा।
 - (6) केन्द्रीय सरकार उप नियम (5) में निर्दिष्ट अनुरोध की प्राप्ति पर नई प्राद्योगिकी के मानकों और प्राचलित प्राचलों को अवधारित करेगी और राजपत्र में प्रकाशित करेगी।
 - (7) साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का प्रत्येक प्रचालक अपना प्रचालन आरंभ करने से पहले शोधन के एक भाग के रूप में भस्मन यंत्र, ऑटोक्लेव या माइक्रोवेव, श्रेडर और बहिःस्राव शोधन संयंत्र स्थापित करेगा।
 - (8) प्रत्येक अधिभोगी द्वारा इन नियमों के प्रकाशन की तारीख से दो वर्ष के अंदर गैर-क्लोरीनीकृत प्लास्टिक की थैलियों का उपयोग बंद कर दिया जाएगा। ऐसे नियमों के प्रकाशन की तारीख से दो वर्ष के बाद क्लोरीनीकृत प्लास्टिक की थैलियों का उपयोग जैव-चिकित्सा अपशिष्ट के भंडारण और परिवहन के लिए नहीं किया जाएगा तथा साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का अधिभोगी या प्रचालक भस्मन के द्वारा इस प्रकार की थैलियों का निपटान नहीं करेगा और जैव-चिकित्सा अपशिष्ट के भंडार एवं परिवहन के लिए उपयोग में लाई गई थैलियां भारतीय मानक ब्यूरो द्वारा प्रकाशित किए जाने वाले मानकों के अनुरूप होंगी। जब तक मानक प्रकाशित नहीं किए जाते तब तक कैरी बैग प्लास्टिक अपशिष्ट प्रबंधन नियम, 2011 के अनुसार होंगे।
 - (9) विकृत या कतरन कर दिए जाने के बाद, जो भी लागू हो, ऑटोक्लेविंग या माइक्रोवेविंग द्वारा शोधन सुनिश्चित करने के बाद शोधित जैव चिकित्सा अपशिष्ट से पुनःचक्रण योग्य वस्तुएं जैसे कि प्लास्टिक और शीशा आदि ऐसे पुनःचक्रकों को दी जाएंगी जिनके पास संबंधित विहित प्राधिकारी से विधि मान्य प्राधिकार या रजिस्ट्रीकरण होगा।
 - (10) साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का अधिभोगी या प्रचालक उप-नियम (9) में निर्दिष्ट ऐसे पुनःचक्रण योग्य अपशिष्ट का रिकॉर्ड रखेगा जिसकी नीलामी या बिक्री की गई है और उसे वार्षिक रिपोर्ट के भाग के रूप में विहित प्राधिकारी को प्रस्तुत किया जाएगा। यह रिकॉर्ड विहित प्राधिकारी द्वारा निरीक्षण के लिए खुला रखा जाएगा।
 - (11) समस्त पारे के अपशिष्ट और सीसा के अपशिष्ट का निपटान संबंधित नियमों और विनियमों के अनुसार किया जाएगा।
8. **पृथक्करण, पैकेजिंग, परिवहन और भंडारण.-** (1) अनुपचारित जैव चिकित्सा अपशिष्ट को अन्य अपशिष्टों के साथ नहीं मिलाया जाएगा।
- (2) जैव चिकित्सा अपशिष्ट को उसके भंडारण, परिवहन, उपचार और व्ययन से पहले अनुसूची-I के अनुसार सृजन के स्थान पर आधान या थैलों में पृथक किया जाएगा।
 - (3) उप नियम (2) में निर्दिष्ट आधान या बैग पर अनुसूची-IV में यथा-विनिर्दिष्ट लेबल लगाया जाएगा।

- (4) अधिभोगी और साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा द्वारा एक वर्ष अंदर बार कोड और ग्लोबल पोजीशनिंग प्रणाली जोड़ी जाएगी।
- (5) साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का प्रचालक किसी ऑफ साइट जैव चिकित्सा अपशिष्ट शोधन सुविधा के लिए किसी अधिभोगी के परिसर से जैव-चिकित्सा अपशिष्ट का परिवहन केवल ऐसे वाहनों में करेगा जिन पर अनुसूची-IV के भाग 'ख' में यथा विनिर्दिष्ट आवश्यक सूचना के साथ अनुसूची-IV के भाग 'क' में यथा-उपबंधित लेवल लगे हों।
- (6) जैव चिकित्सा अपशिष्ट के परिवहन के लिए उपयोग में लाए गए वाहन इस प्रकार के संक्रमित अपशिष्ट के परिवहन के लिए मोटर वाहन अधिनियम 1988 (1988 का 59) में अंतर्विष्ट अपेक्षाओं, यदि कोई हो, के अतिरिक्त राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति अधीन या इसके तहत बनाए गए नियमों द्वारा निर्धारित शर्तों, यदि कोई हो, का पालन करेंगे।
- (7) गैर-शोधित मानव शरीर अपशिष्ट, पशु शरीर अपशिष्ट, ठोस अपशिष्ट या जैव प्रौद्योगिकी अपशिष्ट का भंडारण अड़तालीस घंटे से अधिक अवधि के लिए नहीं किया जाएगा।

परंतु शर्त यह है कि यदि किसी कारण से इस प्रकार का अपशिष्ट इस अवधि से अधिक भंडारण करना आवश्यक हो जाता है तो अधिभोगी यह सुनिश्चित करने के लिए समुचित उपाय करेगा कि यह अपशिष्ट मानव स्वास्थ्य और पर्यावरण पर विपरीत प्रभाव न डाले और ऐसा करने के कारणों की सूचना विहित प्राधिकरण को देगा।

- (8) पैकिंग करने और साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा को भेजने से पहले सूक्ष्म जीव विज्ञान अपशिष्ट और समस्त अन्य क्लिनिकल प्रयोगशाला अपशिष्ट को स्टेरिलाइजेशन टु लॉग 6 अथवा डिसइन्फेक्शन टु लॉग 4 के द्वारा पूर्व उपचारित किया जाएगा।

9. **विहित प्राधिकरण.-** (1) इन नियमों के उपबंधों के कार्यान्वयन के लिए विहित प्राधिकरण राज्यों के संबंध में राज्य प्रदूषण नियंत्रण बोर्ड और संघ राज्य क्षेत्रों में प्रदूषण नियंत्रण समितियां होंगी।

- (2) सभी स्वास्थ्य देखभाल प्रतिष्ठानों के संबंध में, जिसके अंतर्गत रक्षा मंत्रालय के अधीन सशस्त्र सेना के अस्पतालों, नर्सिंग होम, क्लीनिकों, औषधालयों, पशु-चिकित्सा संस्थानों, पशु-गृह, विकृति विज्ञान प्रयोगशालाओं और रक्त बैंक भी हैं इन नियमों के उपबंधों के प्रवर्तन हेतु विहित प्राधिकारी महानिदेशक, सशस्त्र सेना चिकित्सा सेवाएं को रक्षा मंत्रालय के पर्यवेक्षण और नियंत्रण के अधीन कार्य करेगा।
- (3) विहित प्राधिकरण इन नियमों की अनुसूची-III में यथा-अनुबद्ध उत्तरदायित्वों का अनुपालन करेगा।

10. **प्राधिकार के लिए प्रक्रिया.-** जैव चिकित्सा का अपशिष्ट का हथालन करने वाला प्रत्येक अधिभोगी या प्रचालक, मात्रा चाहे जो भी हो, प्राधिकार की मंजूरी के लिए विहित प्राधिकरण अर्थात् राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति को प्ररूप-2 में आवेदन करेगा और विहित प्राधिकरण प्ररूप 3 में अनंतिम प्राधिकार मंजूर करेगा और बिस्तर वाली स्वास्थ्य देखभाल सुविधा और साझा सुविधा के प्रचालक के लिए उक्त प्राधिकार की विधिमान्यता, सहमतियों की विधिमान्यता की समकालिक (एक समय) होगी।

- (1) बिना बिस्तर वाले अधिभोगियों को एक बार का प्राधिकार दिया जाएगा और इस प्रकार के मामलों में प्राधिकार को अनुदत्त मान लिया जाएगा यदि विहित प्राधिकारी से सम्यक रूप से संपूर्ण आवेदन के साथ आवश्यक दस्तावेजों के प्राप्त होने के नब्बे दिन की अवधि के अंदर उस पर कोई आपत्ति प्राप्त नहीं होती है।

- (2) विहित प्राधिकारी द्वारा प्राधिकार के नवीकरण के लिए मना करने, रद्द करने या निलंबित करने के मामले में कारणों को लिखित रूप में लेखबद्ध किया जाएगा।

वशर्त कि प्राधिकार के लिए मना करने से पूर्व विहित प्राधिकारी आवेदक को सुनवाई के लिए एक अवसर देगा।

- (3) प्राधिकार के लिए प्रत्येक आवेदन का निपटान विहित प्राधिकारी द्वारा आवश्यक दस्तावेजों के साथ सम्यक रूप से पूर्ण आवेदन प्राप्त होने की तारीख से नब्बे दिन के अंदर किया जाएगा, जिसके न होने पर यह मान लिया जाएगा कि इन नियमों के अधीन प्राधिकार मंजूर कर दिया गया है।
- (4) जैव चिकित्सा अपशिष्ट के उत्पादन, हथालन, उपचार और निपटान में कोई परिवर्तन हो जाने के मामले में, जिसके लिए पूर्व में प्राधिकार मंजूर किया गया था, अधिभोगी या प्रचालक कार्यकलाप में बदलाव या अंतर के बारे में विहित प्राधिकारी को सूचित करेगा और प्राधिकार की शर्तों में संशोधन के लिए प्ररूप 2 में नए सिरे से आवेदन प्रस्तुत करेगा।

11. **सलाहकार समिति.-** (1) संबंधित राज्य में इन नियमों के कार्यान्वयन का निरीक्षण करने और किसी सुधार की सलाह देने के लिए प्रत्येक राज्य सरकार या संघ राज्य क्षेत्र का प्रशासन संबंधित स्वास्थ्य सचिव की अध्यक्षता में संबंधित राज्य या संघ राज्य क्षेत्र के लिए एक सलाहकार समिति का गठन करेगा। इस समिति में उस राज्य या संघ राज्य क्षेत्र प्रशासन के स्वास्थ्य, पर्यावरण, शहरी विकास, पशुपालन और पशुचिकित्सा विज्ञान के विभागों या राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति, शहरी स्थानीय निकायों या स्थानीय निकायों या नगर निगमों के प्रतिनिधि, भारतीय चिकित्सा संघ, साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा और गैर-सरकारी संगठन के प्रतिनिधि शामिल होंगे।

- (2) उप-नियम (1) में अन्तर्विष्ट किसी बात के होते हुए भी रक्षा मंत्रालय द्वारा महानिदेशक, सशस्त्र सेना स्वास्थ्य सेवा की अध्यक्षता में उक्त समिति गठित की जाएगी जिसमें रक्षा मंत्रालय, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, स्वास्थ्य एवं परिवार कल्याण मंत्रालय, सशस्त्र सेना चिकित्सा कॉलेज या कमान अस्पताल के प्रतिनिधि शामिल होंगे।
- (3) उप-नियम (1) और (2) के अधीन गठित यह समिति कम से कम छः महीने में एक बार बैठक करेगी और यथा-स्थिति राज्य और सशस्त्र सेना स्वास्थ्य देखभाल सुविधाओं में इन नियमों के उपबंध के लागू होने संबंधी सभी मामलों की समीक्षा करेगी।
- (4) स्वास्थ्य मंत्रालय और रक्षा मंत्रालय जैव चिकित्सा अपशिष्ट प्रबंध के क्षेत्र में विशेषज्ञता रखने वाले अन्य सरकारी और गैर-सरकारी संगठनों के प्रतिनिधियों को सहयोजित कर सकते हैं।

12. **स्वास्थ्य देखभाल सुविधाओं में नियमों के लागू होने की मॉनीटरिंग.-** (1) राज्य स्वास्थ्य सचिवों और राज्य प्रदूषण नियंत्रण बोर्डों और केन्द्रीय प्रदूषण नियंत्रण बोर्ड के अध्यक्षों या सदस्य-सचिवों के माध्यम से पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय वर्ष में एक बार देश में इन नियमों के कार्यान्वयन की समीक्षा करेगा और मंत्रालय, यदि अपेक्षित हो, तो जैव चिकित्सा अपशिष्ट प्रबंध के क्षेत्र के विशेषज्ञों को आमंत्रित कर सकता है।

- (2) केन्द्रीय प्रदूषण नियंत्रण बोर्ड रक्षा मंत्रालय के अधीन समस्त सशस्त्र सेना स्वास्थ्य देखभाल स्थापनाओं के संबंध में इन नियमों के लागू होने की मॉनीटरिंग करेगा।
- (3) महानिदेशक, सशस्त्र सेना चिकित्सा सेवा को पूर्व सूचना देने के बाद केन्द्रीय प्रदूषण नियंत्रण बोर्ड नियम 11 के उप-नियम (2) के अधीन गठित सलाहकार समिति के एक या अधिक प्रतिनिधियों के साथ किसी भी सशस्त्र सेना स्वास्थ्य देखभाल स्थापना का निरीक्षण कर सकता है।
- (4) जैव चिकित्सा अपशिष्ट पैदा करने वाली स्वास्थ्य देखभाल सुविधाओं और साझा जैव चिकित्सा अपशिष्ट शोधन और निपटान सुविधाओं में, जिनमें जैव-चिकित्सा अपशिष्ट का शोधन और निपटान किया जाता है, इन नियमों के उपबंधों के अनुपालन की मॉनीटरिंग करने के लिए प्रत्येक राज्य सरकार या संघ राज्य क्षेत्र का प्रशासन जिला नियंत्रक या जिला मजिस्ट्रेट या उपायुक्त या अपर जिला मजिस्ट्रेट की अध्यक्षता में जिलों में जिला स्तरीय मॉनीटरिंग समिति गठित की जाएगी।

- (5) उप-नियम (4) के अधीन गठित जिला स्तरीय मॉनीटरिंग समिति अपनी रिपोर्ट छह महीने में एक बार राज्य सलाहकार समिति को प्रस्तुत करेगी और उसकी एक प्रति आगे आवश्यक कार्रवाई के लिए संबंधित राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति को भी भेजेगी।
- (6) जिला स्तरीय मॉनीटरिंग समिति में जिला चिकित्सा अधिकारी या जिला स्वास्थ्य अधिकारी, राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति, लोक स्वास्थ्य इंजीनियरी विभाग, स्थानीय निकायों, नगर निगम, भारतीय चिकित्सा संघ, साझा जीवचिकित्सा अपशिष्ट शोधन सुविधा और जैव-चिकित्सा अपशिष्ट प्रबंध के क्षेत्र में कार्यरत रजिस्ट्रीकृत गैर-सरकारी संगठनों के प्रतिनिधि शामिल होंगे और यह समिति, यदि आवश्यक हो, तो अन्य सदस्यों और विशेषज्ञों के सहयोजित कर सकती है और जिला चिकित्सा अधिकारी इस समिति के सदस्य-सचिव होंगे।
13. **वार्षिक रिपोर्ट.-** (1) साझा जैव-चिकित्सा अपशिष्ट शोधन सुविधा का प्रत्येक अधिभोगी या प्रचालक प्रत्येक वर्ष 30 जून तक प्ररूप 4 में विहित प्राधिकारी वार्षिक रिपोर्ट प्रस्तुत करेगा।
- (2) विहित प्राधिकारी प्राप्त सूचना का समेकन, समीक्षा और विश्लेषण करेगा और इस सूचना को प्रत्येक वर्ष 31 जुलाई को या उससे पूर्व केन्द्रीय प्रदूषण नियंत्रण बोर्ड को भेजेगा।
- (3) केन्द्रीय प्रदूषण नियंत्रण बोर्ड प्राप्त सूचना का समेकन, समीक्षा और विश्लेषण करेगा और अपनी टिप्पणियों या सुझावों या पर्यवेक्षणों के साथ इन सूचनाओं को प्रत्येक वर्ष 31 अगस्त को या उससे पूर्व पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को भेजेगा।
- (4) अधिभोगियों, राज्य प्रदूषण नियंत्रण बोर्डों और केन्द्रीय प्रदूषण नियंत्रण बोर्ड की वेबसाइटों पर सभी की वार्षिक रिपोर्टें भी ऑनलाइन उपलब्ध रहेंगी।
14. **अभिलेखों को रखना.-** (1) प्रत्येक प्राधिकृत व्यक्ति इन नियमों के अनुसार और केन्द्रीय सरकार या केन्द्रीय प्रदूषण नियंत्रण बोर्ड, जैसी भी स्थिति हो, द्वारा जारी मार्गदर्शक सिद्धांतों के अनुसार पांच वर्ष की अवधि के लिए जैव-चिकित्सा अपशिष्ट के उत्पादन, संग्रहण, प्राप्ति, भंडारण, परिवहन, उपचार, निपटान या हथालन के किसी अन्य प्रकार से संबंधित रिकॉर्ड रखेगा।
- (2) समस्त रिकॉर्ड किसी भी समय विहित प्राधिकारी और पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के निरीक्षण और सत्यापन के अध्वधीन होंगे।
15. **दुर्घटना की सूचना देना.-** (1) जैव-चिकित्सा अपशिष्ट का हथालन करते समय किसी संस्था या सुविधा या किसी स्थल पर कोई भारी दुर्घटना हो जाने के मामले में प्राधिकृत व्यक्ति ऐसी दुर्घटना के बारे में विहित प्राधिकारी को तत्काल सूचित करेगा और चौबीस घंटे के अंदर प्ररूप 1 में लिखित रूप में किए गए उपचारात्मक उपायों के बारे में सूचित करेगा।
- (2) सभी अन्य दुर्घटनाओं और किए गए उपचारात्मक उपायों के बारे में सूचना अधिभोगी द्वारा नियम 13 के अनुसार विहित प्राधिकारी को वार्षिक रिपोर्ट में उपलब्ध कराई जाएगी।
16. **अपील.-** (1) इन नियमों के अधीन विहित प्राधिकारी द्वारा किए गए आदेश से कोई भी व्यक्ति उस तारीख से जिसको उसे आदेश की संसूचना दी जाती है, तीस दिन के अवधि के भीतर राज्य सरकार या संघ राज्य क्षेत्र प्रशासन के सचिव (पर्यावरण) को प्ररूप 5 में अपील कर सकेगा।
- (2) इन नियमों के अधीन सशस्त्र सेना चिकित्सा सेवा के महानिदेशक के आदेश से व्यथित कोई भी व्यक्ति, उस तारीख से, जिसको उसे आदेश संसूचित किया जाता है, तीस दिन के भीतर सचिव, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को प्ररूप 5 में अपील प्रस्तुत कर सकता है।
- (3) यथा स्थिति उप पैरा (1) और (2) में निर्दिष्ट प्राधिकारी तीस दिनों की उक्त अवधि के समाप्त होने के पश्चात अपील पर ग्रहण कर सकेगा, यदि वह उसका यह समाधान हो जाता है कि अपीलार्थी को समय पर अपील फाइल न कर पाने के पर्याप्त कारण से रोका गया था।

(4) अपील का निपटान उसे फाइल करने के तारीख से नब्बे दिन के भीतर किया जाएगा।

17. **साझा जैव चिकित्सा अपशिष्ट शोधन और निपटान सुविधा के लिए स्थल.-** (1) इन नियमों के नियम 5 पर प्रतिकूल प्रभाव डाले बिना जिस विभाग को भूमि समनुदेशित करने का कार्य आवंटित किया गया है वह राज्य सरकार या संघ राज्य क्षेत्र प्रशासन में साझा जैव-चिकित्सा अपशिष्ट शोधन और निपटान सुविधा स्थापित करने हेतु उपयुक्त स्थल उपलब्ध कराने के लिए जिम्मेदार होगा।

(2) ऐसी सुविधा की स्थापना हेतु स्थल का चयन विहित प्राधिकारी, अन्य पण धारकों के परामर्श से और पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय अथवा केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा प्रकाशित मार्गदर्शक सिद्धान्तों के अनुसरण किया जाएगा।

18. **सुविधा के अधिभोगी, प्रचालक का दायित्व.-** (1) साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का अधिभोगी अथवा प्रचालक जैव अचिकित्सा अपशिष्टों के अनुचित हथालन के कारण पर्यावरण अथवा जनता को होने वाली नुकसानियों के लिए उत्तरदायी होगा।

(2) साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का अधिभोगी या प्रचालक किसी भी अतिक्रमण के मामले में अधिनियम की धारा 5 और धारा 15 के अधीन कार्रवाई के लिए दायी होगा।

अनुसूची-I

[नियम 3 (ड), 4(ख), 7(1), 7(2), 7(5), 7(6) और 8(2) देखें]

भाग-1

जैव-चिकित्सीय अपशिष्टों की श्रेणियां तथा उनके पृथक्करण, संग्रहण, उपचार, प्रसंस्करण के विकल्प

श्रेणी	अपशिष्ट का प्रकार	प्रयोग की जाने वाली थैली/आधान का प्रकार	उपचार और निपटान विकल्प
(1)	(2)	(3)	(4)
पीला	(क) मानवीय शारीरिक अपशिष्ट: मानवीय ऊतक, अंग, शरीर के अवयव जीवनक्षम अवधि से कम के भ्रूण (समय-समय पर संशोधित गर्भ या चिकित्सा समापन अधिनियम, 1971 के अनुसार) (ख) पशु शारीरिक अपशिष्ट : पशु चिकित्सालयों या महाविद्यालयों अथवा पशु गृहों से उत्पन्न अपशिष्ट सहित प्रयोगात्मक पशु मृत शरीर, शरीर के	पीले रंग की गैर क्लोरीनीकृत प्लास्टिक की थैलियां	भस्मन या प्लाज्मा पाइरोलाइसिस या गहरा दबाना*

	अवयव, अंग, ऊतक।		
	(ग) ठोस अपशिष्ट : रक्त शारीरिक स्राव से युक्त मदें जैसे, पट्टी, प्लास्टर, कास्ट, कपड़े की झाड़ने और अवशेष या निष्प्रयोजन रक्त और रक्त के घटकों से भरी थैलियां।		भस्मन या प्लाज्मा पाइरोलाइसिस या गहरा दवाना* उपर्युक्त सुविधाओं की अनुपस्थिति में; ऑटोक्लेविंग अथवा माइक्रो-वेविंग/ हाइड्रोक्लेविंग के बाद श्रेडिंग अथवा म्युटिलेशन अथवा स्टेराइल्लिजेशन और श्रेडिंग। शोधित अपशिष्ट को ऊर्जा पुनः प्राप्ति हेतु भेजा जाएगा।
	(घ) अवसित या व्यक्त दवाइयां : औषधीय अपशिष्ट जैसे कि एंटीबायोटिक्स, साइटोटॉक्सिक औषधियां जिसमें शीशे के साथ साइटोटॉक्सिक औषधियों से संदूषित सभी मदें, प्लास्टिक एम्पूल, गोलियां आदि शामिल हैं।	गैर-क्लोरीनीकृत पीले रंग की प्लास्टिक की थैलियां अथवा आधान	अवसित साइटोटॉक्सिक दवाइयां और साइटोटॉक्सिक दवाइयों से संदूषित दवाइयां >1200 डिग्री से. तापमान पर भस्म करने के लिए विनिर्माता या आपूर्तिकर्ता को वापस कर दी जाएं या >1200 डिग्री से. तापमान पर भस्म करने के लिए साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा या परिसंकटमय अपशिष्ट उपचार, भंडारण और निपटान सुविधा को भेज दी जाएं या >1200 डिग्री से. तापमान एनकेप्सुलेशन या प्लाज्मा पाइरोलाइसिस किया जाए। अन्य सभी अवसित दवाइयां या तो विनिर्माता को वापस भेज दी जाएं या भस्म करके निपटान कर दिया जाए।
	(ङ.) रासायनिक अपशिष्ट : जैव-विज्ञान संबंधी मदों के उत्पादन में उपयोग में लाए गए या व्यक्त विसंक्रामकों के लिए उपयोग में लाए गए रसायन।	गैर-क्लोरीनीकृत पीले रंग की प्लास्टिक की थैलियां या आधान	परिसंकटमय अपशिष्ट उपचार, भंडारण और निपटान सुविधा में भस्मीकरण या प्लाज्मा पाइरोलासिस या एनकेप्सुलेशन द्वारा निपटान किया जाए।
	(च) रासायनिक द्रव अपशिष्ट : जीव विज्ञान संबंधी मदों के उत्पादन या अतिक्रान्त विसंक्रामकों के लिए, उपयोग में लाए जाने के कारण द्रव अपशिष्ट सिल्वर एक्स-रे फिल्म विकसित करने वाला द्रव, निष्प्रयोजन फोरमेलिन,	बहिःस्राव शोधन प्रणाली में जाने वाली अलग संग्रहण प्रणाली	रिकवरी के बाद, रासायनिक द्रव अपशिष्ट को अन्य जल में मिश्रित होने से पहले पूर्व-उपचारित किया जाएगा। संयुक्त निस्सरण अनुसूची-III में दिए गए निस्सरण सन्नियमों के अनुरूप होगा।

	संक्रमित स्राव, एस्पाइरेटेड शरीर द्रव, प्रयोगशालाओं, फर्श की सफाई, धुलाई, हाउस कीपिंग और विसंक्रमण कार्यकलापों से निकलने वाले द्रव।		
	(छ) रक्त अथवा शरीरिक द्रव से संदूषित फेंके गए लीनेन, बिस्तर	गैर-क्लोरीनीकृत पीली प्लास्टिक की थैलियां या उपयुक्त पैकिंग सामग्री	गैर-क्लोरीनीकृत रासायनिक विसंक्रमण के बाद भस्मन या प्लाज्मा पाइरोलाइसिस या एनर्जी रिकवरी द्वारा। उपर्युक्त सुविधाओं की अनुपस्थिति में, श्रेडिंग अथवा म्युटिलेशन अथवा स्टेराइलजेशन तथा श्रेडिंग का मिश्रण/उपचारित अपशिष्ट को ऊर्जा प्राप्ति अथवा भस्मन अथवा प्लाज्मा पाइरोलाइसिस के लिए भेजा जाए।
	(ज) सूक्ष्मजैविकी, जैव प्रौद्योगिकी और अन्य क्लीनिकल प्रयोगशाला अपशिष्ट : प्रयोगशाला संवर्धों, सूक्ष्म जीवों के संग्रह या नमूने, सजीव या अनुकूल टीके, अनुसंधान और औद्योगिक प्रयोगशालाओं में प्रयुक्त मानवीय और पशु कोशिका संवर्धों, जैविकों, अवशेष जीवविषों, संबंधों हेतु प्रयुक्त पात्रों और यंत्रों का उत्पादन।	ऑटोक्लेव सुरक्षित प्लास्टिक की थैलियां या आधान	इसके बाद भस्मन के लिए राष्ट्रीय एड्स नियंत्रण संगठन अथवा विश्व स्वास्थ्य संगठन के मार्गदर्शक सिद्धान्तों के अनुसार स्थल पर गैर क्लोरीनीकृत रसायनों से पूर्व उपचारित अथवा स्टेरेलाइज ।
लाल	संदूषित अपशिष्ट (पुनर्चक्रण योग्य) : (क) ट्यूबिंग्स, बोतलों, इंद्रावीनस ट्यूबों और सेटों, कैथेटरों, मूत्र की थैलियों, सिरिंजों (बिना सूई वाला और सूई लगी सिरिंज तथा वैक्युटेनरों, जिनकी सूई कटी हो और दस्तानों) जैसी निपटान	लाल रंग की गैर-क्लोरीनीकृत प्लास्टिक थैलियां या आधान	ऑटोक्लेविंग या माइक्रोवेविंग/ हाइड्रोक्लेविंग के पश्चात श्रेडिंग या म्युटिलेशन या श्रेडिंग और विसंक्रमण का संयोजन। उपचारित अपशिष्ट रजिस्ट्रीकृत या प्राधिकृत पुनर्चक्रकों को या एनर्जी रिकवरी के लिए या प्लास्टिक डीजल या ईंधन तेल या सड़क बनाने के लिए जो भी संभव हो, भेजा जाए। प्लास्टिक अपशिष्ट भू-भरण स्थलों पर नहीं भेजना चाहिए।

	योग्य मदों से उत्पन्न अपशिष्ट।		
सफेद (पारभासी)	धातुओं सहित नोकदार अपशिष्ट : सूइयां, सूइयां लगी सिरिंजे, सूई की नोक के कटर या बर्नर से निकली सूइयां, स्कालपेल्स, ब्लेड या कोई अन्य संदूषित नोकदार वस्तु जो वेधन और कर्तन का कारण बन करती है। इसमें प्रयुक्त, निष्प्रयोजन और संदूषित नोकदार धातु की वस्तुएं शामिल हैं।	पंचर प्रूफ, लीक प्रूफ, टेंपर प्रूफ आधान	ऑटोक्लेविंग या शुष्क ऊष्मा विसंक्रमण उसके पश्चात धातु के कंटेनर या सीमेंट कंक्रीट में श्रेडिंग या म्युटिलेशन या एनकेप्सुलेशन; श्रेडिंग कम ऑटोक्लेविंग का संयोजन, और अंतिम निपटान के लिए लोहे की संधानशालाओं (जिनके पास राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समितियों के प्रचालन की सहमति है) या स्वच्छता भू-भरण स्थलों या नामोदिष्ट कंक्रीट अपशिष्ट शार्प पिट के लिए भेज दिया जाए।
नीला	(क) कांच के बर्तन : टूटा हुआ त्यक्त या संदूषित कांच, जिसमें दवाई की शीशियां और सम्पूल्स शामिल हैं परन्तु इसमें साइटोटॉक्सिक अपशिष्ट से संदूषित वस्तुएं शामिल नहीं हैं। (ख) धातु की बॉडी वाले इम्प्लांट	नीले रंग की मार्किंग वाले गत्ते के बक्से नीले रंग की मार्किंग वाले गत्ते के बक्से	विसंक्रमण (डिटर्जेंट और सोडियम हाइपोक्लोराइट शोधन के साथ साफ करने के बाद डुबा कर धुलाई किया गया कांच का अपशिष्ट) या ऑटोक्लेविंग या माइक्रोवेविंग या हाइड्रोक्लेविंग के जरिए और उसके पुनःचक्रण के लिए भेजे।

*गहरा दबाकर निपटान करने की अनुमति केवल ग्रामीण और सुदूरवर्ती क्षेत्रों में है जहां साझा जैव-चिकित्सा अपशिष्ट उपचार की सुविधा सुलभ नहीं है। ऐसा विहित प्राधिकारी से पूर्व अनुमोदन प्राप्त करके और अनुसूची-3 में विनिर्दिष्ट मानकों के अनुसार किया जाएगा। गहरा दबाने की सुविधा समय-समय पर केन्द्रीय प्रदूषण नियंत्रण बोर्ड जारी उपबंधों और मार्गदर्शक सिद्धान्तों के अनुसार अवस्थित की जाएंगी।

भाग - 2

- (1) सभी प्लास्टिक की थैलियां बीआईएस मानकों, जब भी प्रकाशित किए जाएंगे, के अनुसार होंगी तब तक वर्तमान प्लास्टिक अपशिष्ट प्रबंधन नियम लागू होंगे।
- (2) कम से कम 10% सोडियम हाइपोक्लोराइट का उपयोग करने वाले रासायनिक उपचार को जिसमें बीस मिनट के लिए 30% अवशिष्ट क्लोराइन या कोई अन्य समतुल्य रासायनिक रीजेंट होता है, सूक्ष्म जीव के लिए $\text{Log}_{10}4$ ह्रास इफिशिएंसी दर्शानी चाहिए, जैसा कि अनुसूची-III में दिया गया है।
- (3) म्युटिलेशन या श्रेडिंग उस सीमा तक करना आवश्यक है जिससे अप्राधिकृत पुनः उपयोग को रोका जा सके।

- (4) माइक्रोबायोलॉजिकल, प्रयोगशाला और अत्यधिक संक्रामक अपशिष्ट को छोड़कर भस्मन से पहले कोई रासायनिक पूर्व-उपचार नहीं किया जाएगा।
- (5) भस्मन की राख (किसी जैव-चिकित्सा अपशिष्ट के भस्मन से निकलने वाली राख) का निपटान परिसंकटमय अपशिष्ट उपचार, भंडारण और निपटान सुविधा के माध्यम से किया जाएगा यदि उसमें विषाक्त या खतरनाक संघटक खतरनाक अपशिष्ट (प्रबंधन, हथालन और सीमापारीय संचलन) नियम, 2008 दी गई या समय-समय यथा संशोधित विहित सीमा से अधिक पाए जाते हैं।
- (6) विधिमान्य अवधि के बाद के मृत भूणों को (समय-समय पर यथा संशोधित एमटीपी अधिसूचना, 1971 के अनुसार) मानव शरीर-रचना का अपशिष्ट माना जा सकता है। ऐसे अपशिष्ट को अस्पताल या चिकित्सा देखभाल स्थापना के प्रसूति-विशेषज्ञ या चिकित्सा अधीक्षक के आधिकारिक गर्भ का चिकित्सीय समापन प्रमाणपत्र के साथ पीली थैली में साझा जैव चिकित्सा अपशिष्ट उपचार और निपटान सुविधा के प्रचालक को सौंपा जाना चाहिए।
- (7) साइटोटॉक्सिक औषधि की शीशियां किसी भी परिस्थिति में अप्राधिकृत व्यक्ति को नहीं सौंपनी चाहिए। किसी एक स्थान पर आवश्यक निपटान के लिए इन्हें वापस निर्माता के पास वापस भेजना चाहिए। दूसरे विकल्प के रूप में इन्हें >1200 डिग्री से. तापमान पर साझा जैव चिकित्सा अपशिष्ट शोधन और निपटान सुविधा या परिसंकटमय अपशिष्ट उपचार, भंडारण और निपटान सुविधा या प्लाज्मा पाइरोलिसिस में भस्मन के लिए भेज दिया जाए।
- (8) अवशिष्ट या व्यक्त रासायनिक अपशिष्टों, प्रयुक्त या व्यक्त विसंक्रामकों और रासायनिक गाद का निपटान परिसंकटमय अपशिष्ट उपचार, भंडारण और निपटान सुविधा में किया जा सकता है। इस प्रकार के मामले में, अपशिष्ट को परिसंकटमय अपशिष्ट शोधन, भंडारण और निपटान सुविधा के पास केवल साझा जैव चिकित्सा अपशिष्ट शोधन और निपटान सुविधा के प्रचालक के माध्यम से भेजना चाहिए।
- (9) प्रयोगशाला अपशिष्ट, सूक्ष्मजीव अपशिष्ट, रक्त के नमूनों, रक्त की थैलियों को स्थल पर पूर्व उपचारित करके विश्व स्वास्थ्य संगठन या राष्ट्रीय एड्स नियंत्रण संगठन के मार्गदर्शक सिद्धान्तों के अनुसार विसंक्रमित या जीवाणुरहित किया जाना चाहिए और उसके बाद साझा जैव चिकित्सा अपशिष्ट उपचार और निपटान सुविधा को दिया जाना चाहिए।
- (10) इन हाउस भस्मक स्थापित करने की अनुमति नहीं है। तथापि, यदि समीप में कोई साझा जैव-चिकित्सा अपशिष्ट निपटान सुविधा नहीं है तो राज्य प्रदूषण नियंत्रण बोर्ड से प्राधिकार प्राप्त करने के बाद अधिभोगी द्वारा इसे स्थापित किया जा सकता है।
- (11) सिरिंजों को या तो म्युटिलेस्युटिलेट कर देना चाहिए या सूइयों को काट देना चाहिए तथा अथवा नुकीली वस्तुओं के भंडारण के टेम्पर प्रूफ, लीक प्रूफ और पंचर प्रूफ आधानों में इनका भंडारण करना चाहिए। जहां कहीं अधिभोगी किसी निपटान सुविधा संबद्ध नहीं है विहित रीति के अनुसार विसंक्रमण और निपटान करने की जिम्मेदारी अधिभोगी की होगी।
- (12) स्वास्थ्य देखभाल के कार्यकलापों के दौरान घरों में जनित जैव-चिकित्सा अपशिष्ट को इन नियमों के अनुसार पृथक किया जाएगा और अलग थैलियों या आधानों में नगरपालिका के अपशिष्ट संग्रहकर्ता को सौंपा जाएगा। अनुसूची में यथा निहित रीति में अंतिम निपटान के लिए शहरी स्थानीय निकाय, साझा जैव चिकित्सा अपशिष्ट शोधन और निपटान सुविधा के बीच व्यवस्था के अनुसार सामग्री प्रतिप्राप्ति सुविधा (एमआरएफ) से या सीधा घर से इस अपशिष्ट को उठवाने की व्यवस्था करेगा।

अनुसूची-II

[नियम 4(ण), 7(1) और 7(6) देखें]

जैव-चिकित्सा अपशिष्ट के उपचार और निपटान हेतु मानक

1. भस्मक के लिए मानक.-

सभी भस्मक निम्नलिखित प्रचालन और उत्सर्जन मानक पूरे करेंगे.-

क. प्रचालन मानक

- (1) दहन दक्षता (CE) कम से कम 99.00%
 (2) दहन दक्षता की गणना इस प्रकार की जाती है :

$$\%CO_2$$

$$CE = \frac{\%CO_2}{\%CO_2 + \%CO} \times 100$$

$$\%CO_2 + \%CO$$

- (3) प्राइमरी चैम्बर का तापमान न्यूनतम 800⁰ सेल्सियस और सेकेंडरी चैम्बर का न्यूनतम तापमान 1050⁰ सेल्सियस + या -50⁰ सेल्सियस होगा।
 (4) सेकेंडरी चैम्बर में गैस रहने का समय कम से कम दो सेकेंड होगा।

ख. उत्सर्जन मानक

क्र.सं.	पैरामीटर	मानक	
1.	2.	3.	4.
		जब तक सूचित न किया गया हो mg/NM ³ में सांद्रता सीमांत	जब तक सूचित न किया गया हो, मिनट वार सैपलिंग अवधि
1.	महीन कण	50	30 अथवा सैम्पल वॉल्यूम का 1NM ³ जो भी अधिक हो
2.	नाइट्रोजन ऑक्साइड NO और NO ₂	400	ऑनलाइन सैम्पलिंग या ग्रैव सैम्पल के लिए 30
3.	एचसीएल	50	30 या सैम्पल वॉल्यूम का 1NM ³ का जो भी अधिक हो
4.	कुल डायोक्सीन और फुरान**	0.1 ngTEQ/NM ³ (11% O ₂ पर)	8 घंटे या सैम्पल वॉल्यूम का 5 NM ³ का जो भी अधिक हो

5.	एचजी और इसके यौगिक	0.05	2 घंटे या सैम्पल वॉल्यूम का 1NM ³ जो भी अधिक हो

(ग). स्टैक ऊंचाई : न्यूनतम स्टैक ऊंचाई भूमि से 30 मीटर ऊपर होगी तथा पर्यावरण (संरक्षण) अधिनियम, 1986 के अधीन यथा अधिसूचित और उत्सर्जन विनियम भाग-3 के केन्द्रीय प्रदूषण नियंत्रण बोर्ड के मार्गदर्शक सिद्धांतों के अनुसार "साधारण प्रांचल पैरामीटरों" की मॉनीटरिंग करने की यथा अपेक्षित आवश्यक मॉनीटरिंग सुविधाओं से जुड़ा होगा।

टिप्पण :

- (क) विद्यमान भस्मक अधिसूचना की तारीख से दो वर्ष की अवधि के अंदर उपर्युक्त का अनुपालन करेंगे।
- (ख) विद्यमान भस्मक इन नियमों के लागू होने की तारीख से दो वर्ष के भीतर नीचे दिए गए अनुसार डायक्सीनों और फुरान के 0.1 ngTEQ/Nm³ मानकों का अनुपालन करेंगे।
- (ग) भस्मक की सुविधा वाली या कैप्टिव भस्मक वाली आगामी सभी साझा जैव चिकित्सा अपशिष्ट उपचार और निपटान सुविधाएं डायक्सीनों और फुरान के मानकों का अनुपालन करेंगी।
- (घ) यदि आवश्यक, हो तो उपर्युक्त उत्सर्जन सीमाओं की प्राप्ति हेतु विद्यमान द्वितीयक भस्मक चेम्बर में उपयुक्त रूप से तैयार किए गए प्रदूषण नियंत्रक यंत्र लगे होने चाहिए या बाद में लगा देने चाहिए।
- (ङ) भस्म किए जाने वाले अपशिष्टों को किसी भी प्रकार के क्लोरीनीकृत जीवाणुनाशकों से रासायनिक रूप से शोधित नहीं किया जाएगा।
- (च) जैव-चिकित्सा अपशिष्ट के भस्मीकरण से प्राप्त राख का निपटान साझा खतरनाक अपशिष्ट उपचार और निपटान सुविधा के माध्यम से किया जाएगा। तथापि यदि भस्मीकरण राख में विषैली धातुएं समय-समय पर यथा संशोधित परिसंकटमय खतरनाक अपशिष्ट (प्रबंधन और हथालन तथा सीमा-पारीय संचलन) नियम, 2008 के अधीन यथा परिभाषित विनियामक मात्राओं के भीतर हैं तो इनका निपटान नगरीय भूमि भरण स्थल में किया जाएगा।
- (छ) भस्मक में ईंधन के रूप में केवल हल्के डीजल ऑयल या न्यून सल्फर भारी स्टॉक या डीजल, संपीड़ित प्राकृतिक गैस, द्रवीभूत प्राकृतिक गैस अथवा द्रवीभूत पेट्रोलियम गैस जैसे केवल न्यून सल्फर ईंधन का प्रयोग किया जाएगा।
- (ज) किसी साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का अधिभोगी या प्रचालक, पर्यावरण (संरक्षण) अधिनियम, 1986 के अधीन अनुमोदित किसी प्रयोगशाला के माध्यम से तीन माह में एक बार स्टैक गैसीय उत्सर्जन (भस्मक की इष्टतम क्षमता के अधीन) की मॉनीटरिंग करेगा और उक्त विश्लेषण परिणामों का अभिलेख रखा जाएगा तथा विहित प्राधिकारी को प्रस्तुत किया जाएगा। डायोक्सीनों और फुरान के मामले में वर्ष में एक बार मॉनीटरिंग की जाएगी।
- (झ) साझा जैव चिकित्सा अपशिष्ट प्रबंधन सुविधा का अधिभोगी या प्रचालक प्राधिकार में राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समितियों द्वारा नियत प्रांचलों के लिए सतत उत्सर्जन मॉनीटरिंग प्रणाली स्थापित करेगा और राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समितियों और केन्द्रीय प्रदूषण नियंत्रण बोर्ड के सर्वरों के लिए वास्तविक समय के आंकड़े प्रेषित करेगा।
- (ञ) सभी मॉनीटररी किए गए मान शुष्क आधार पर 11% ऑक्सीजन तक शुद्ध किए जाएंगे।
- (ट) भस्मक (दहन चैम्बर) ऐसे तापमान, धारण समय और विक्षोभ के साथ प्रचालित किए जाएंगे जिससे धातुमल और तली की राख में कुल जैविक कार्बन की मात्रा 3% से कम प्राप्त की जा सके या ज्वलन पर उनकी क्षति शुष्क भार की 5% से कम हो।
- (ठ) साझा जैव-चिकित्सीय अपशिष्ट भस्मक का अधिभोगी या प्रचालक CO₂, CO और O₂ को मापने के लिए दहन गैस एनालाइजर का प्रयोग करेगा।

2. प्लाज्मा पाइरोलाइसिस या गैसीफिकेशन द्वारा निपटान के लिए प्रचालन और उत्सर्जन मानक:**क. प्रचालन मानक :**

प्लाज्मा पाइरोलाइसिस और गैसीफिकेशन के सभी प्रचालक निम्नलिखित प्रचालन और उत्सर्जन मानकों को पूरा करेंगे :

- (1) दहन दक्षता (सीई) कम से कम 99.99% होगी।
- (2) दहन दक्षता की गणना नीचे दिए अनुसार की जाती है :

$$\%CO_2$$

$$\text{सीई} = \frac{\%CO_2}{\%CO_2 + \%CO} \times 100$$

$$\%CO_2 + \%CO$$

- (3) प्लाज्मा गैसीफिकेशन के पश्चात दहन चैम्बर का तापमान $1050 \pm 50^\circ$ सेल्सियस होगा जिसके साथ गैस रहने का समय कम से 2 (दो) सेकेंड होगा और स्टैक गैस में कम से कम 3% ऑक्सीजन होगी।
- (4) स्टैक की ऊंचाई भूमि से कम से 30 मीटर होगी तथा पर्यावरण (संरक्षण) अधिनियम, 1986 के अधीन यथा अधिसूचित और उत्सर्जन विनियम भाग-3 के केन्द्रीय प्रदूषण नियंत्रण बोर्ड के मार्गदर्शक सिद्धान्तों के अनुसार "साधारण प्राचलों" की मॉनीटरिंग करने की यथा अपेक्षित सुविधाओं से जुड़ा होगा।

ख. वायु उत्सर्जन मानक और वायु प्रदूषण नियंत्रण के उपाय

- (i) भस्मक के उत्सर्जन मानक, इस अनुसूची में ऊपर क्रम सं.1 पर अधिसूचित और समय-समय पर संशोधित, प्लाज्मा पाइरोलीसिस या गैसीफिकेशन के लिए भी लागू होंगे।
- (ii) यदि आवश्यक हो तो उपर्युक्त उत्सर्जन सीमाओं को पूरा करने के लिए प्लाज्मा पाइरोलीसिस या गैसीफिकेशन के साथ या बाद में उपयुक्त डिजाइन वाले वायु प्रदूषण नियंत्रण उपकरण स्थापित किए जाएंगे।
- (iii) प्लाज्मा पाइरोलीसिस या गैसीफिकेशन का उपयोग करके उपचारित किए जाने वाले अपशिष्टों को किसी क्लोरीनीकृत विसंक्रामक से रासायनिक रूप से शोधित नहीं किया जाएगा तथा क्लोरीनीकृत प्लास्टिक इस प्रणाली में शोधित नहीं किया जाएगा।

ग. राख या काचित सामग्री का निपटान : प्लाज्मा पाइरोलीसिस या गैसीफिकेशन से उत्पन्न राख या काचित सामग्री का निपटान यदि संघटक उक्त नियमों की अनुसूची-II के अधीन विहित सीमाओं से अधिक है तो खतरनाक अपशिष्ट (प्रबंधन, हथालन और सीमापारीय संचलन) नियम, 2008 और इसके बाद किए गए संशोधनों के अनुसार अन्यथा पर्यावरण (संरक्षण) नियम, 1986 के अनुसार किया जाएगा।

3. जैव चिकित्सा अपशिष्ट के ऑटोक्लेविंग हेतु मानक.-

ऑटोक्लेव को जैव चिकित्सा अपशिष्ट को रोगाणुमुक्त और उपचारित करने के प्रयोजनार्थ ही उपयोग में लाया जाना चाहिए।

- (1) ग्रेविटी फ्लो ऑटोक्लेव का प्रचालन करते समय, चिकित्सा अपशिष्ट निम्नलिखित के अध्यधीन होगा:
 - (i) कम से कम 60 मिनट के किसी ऑटोक्लेव रेजिडेन्स समय हेतु कम से कम 121° से. का तापमान और 15 पाउंड्स प्रति वर्ग इंच (पीएसआई) का दबाव; या
 - (ii) कम से कम 45 मिनट के किसी ऑटोक्लेव रेजिडेन्स समय हेतु कम से कम 135° से. का तापमान और 31 पाउंड्स प्रति वर्ग इंच (पीएसआई) का दबाव; या
 - (iv) कम से कम 30 मिनट के किसी ऑटोक्लेव रेजिडेन्स समय हेतु कम से कम 149° से. का तापमान और 52 पाउंड्स प्रति वर्ग इंच (पीएसआई) का दबाव;

(2) किसी वैक्यूम ऑटोक्लेव को प्रचालित करते समय चिकित्सीय अपशिष्ट ऑटोक्लेव से संपूर्ण वायु को निष्कासित करने के लिए न्यूनतम तीन वैक्यूम-पूर्व पल्स के अध्यधीन होगा। वैक्यूम पूर्व चक्र के दौरान निष्कासित वायु को एचईपीए और एक्टिवेटेड कार्बन फिल्टरेशन, वाष्प शोधन या किसी अन्य प्रकार से संदूषण मुक्त किया जाए। अपशिष्ट निम्नलिखित के अधीन होगा :

- (i) कम से कम 45 मिनट के किसी ऑटोक्लेव रेजिडेन्स समय हेतु कम से कम 121⁰ से. का मापमान और 15 पाउंड्स प्रति वर्ग इंच (पीएसआई) का दबाव; या
- (ii) कम से कम 30 मिनट के किसी ऑटोक्लेव रेजिडेन्स समय हेतु कम से कम 135⁰ से. का तापमान और 31 पाउंड्स प्रति वर्ग इंच (पीएसआई) का दबाव; या

(3) जैव चिकित्सीय अपशिष्ट को तब तक समुचित रूप से उपचारित नहीं माना जाएगा जब तक कि समय, तापमान और दबाव सूचक यह न दर्शाए कि ऑटोक्लेव प्रक्रिया के दौरान अपेक्षित समय, तापमान और दबाव की प्राप्ति की गई। यदि किसी भी कारण से समय, तापमान या दबाव सूचक यह दर्शाता है कि अपेक्षित तापमान, दबाव या रेजिडेन्स समय की प्राप्ति नहीं हुई थी तो चिकित्सीय अपशिष्ट का संपूर्ण भार पुनः ऑटोक्लेव किया जाना चाहिए जब तक कि उचित तापमान, दबाव और रेजिडेन्स समय की प्राप्ति न हो जाए।

(4) प्रचालन पैरामीटरों की रिकॉर्डिंग : प्रत्येक ऑटोक्लेव में ग्राफिक या कम्प्यूटर रिकॉर्डिंग यंत्र होंगे जो ऑटोक्लेव चक्र की संपूर्ण अवधि में तारीखें, दिन का समय, भार पहचान संख्या और प्रचालन पैरामीटर को स्वतः और लगातार मॉनीटर तथा रिकॉर्ड करेगा।

(5) ऑटोक्लेव की विधिमान्यता जांच : वैधता जांच में चार जीवाणु सूचक स्ट्रिप्स का प्रयोग होगा; एक का प्रयोग नियंत्रण के रूप में होगा और इसे कमरे के तापमान पर रखा जाएगा और तीन को अपशिष्ट युक्त तीन आधानों के समीपवर्ती केन्द्र में रखा जाएगा। जैविक संकेतकों को रखने के प्रयोजन से कंटेनर खोलते समय वैयक्तिक सुरक्षा उपस्कर (दस्ताने, फेस मास्क और कवरआल) का प्रयोग किया जाएगा। वाष्प भरने के लिए जैविक संकेतक सहित कम से कम एक आधान सर्वाधिक कठिन स्थान सामान्यतः अपशिष्ट के ढेर की तली के बीच रखा जाना चाहिए। अधिभोगी या प्रचालक न्यूनतम प्रचालन शर्तें निश्चित करने के लिए लगातार तीन बार यह जांच करेंगे। तापमान, दबाव और ठहराव समय जब लगातार तीन जांचों के सभी जीवाणु संकेतक वायल्स या स्ट्रिप्स जीवाणुओं की पूर्ण रूपेण निष्क्रियता दर्शाएं तो ऑटोक्लेव के लिए न्यूनतम प्रचालन शर्तें निर्धारित की जाएंगी। न्यूनतम तापमान, दबाव और ठहराव समय अवधारित करने के पश्चात साझा जैव चिकित्सा अपशिष्ट शोधन सुविधा का अधिभोगी या प्रचालक तीन महीने में एक बार यह जांच करेगा और इससे संबंधित रिकॉर्ड रखा जाएगा।

(6) नेमी जांच : किसी कतिपय तापमान की प्राप्ति का सत्यापन करने के लिए उस रसायन सूचक स्ट्रिप या टेप का प्रयोग किया जा सकता है जिसका रंग विनिर्दिष्ट तापमान पर पहुंचने पर परिवर्तित हो सकता है। यह आवश्यक होगा कि भिन्न-भिन्न स्थानों पर अपशिष्ट पैकेज के ऊपर एक से अधिक स्ट्रिप का उपयोग किया जाए ताकि यह सुनिश्चित हो सके कि पैकेज की आंतरिक सामग्री को पर्याप्त रूप से ऑटोक्लेव कर दिया गया है। साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा का अधिभोगी या प्रचालक प्रत्येक बैच की ऑटोक्लेविंग के दौरान यह जांच करेगा और इससे संबंधित रिकॉर्ड रखे जाएंगे।

(7) जीवाणु जांच : ऑटोक्लेव को प्रत्येक ऑटोक्लेव इकाई की अधिकतम डिजाइन क्षमता पर अनुमोदित जैविक सूचक को पूर्णतः और लगातार मार देना चाहिए। ऑटोक्लेव के लिए जैविक सूचक कम से कम 1×10^6 जीवाणु प्रति मिली लीटर सहित वायल्स या जीवाणु स्ट्रिप्स का प्रयोग करते हुए बेसिल्लस स्टीएरोथर्मोफिलस स्पोर्स होगा किसी भी स्थिति में किसी ऑटोक्लेव के न्यूनतम प्रचालन प्रांचल 30 मिनट के रेजिडेन्स समय, 121⁰ से. तापमान या 15 पीएसआई से दबाव से कम नहीं होंगे। साझा जैव चिकित्सा अपशिष्ट शोधन उपचार का अधिभोगी या प्रचालक सप्ताह में कम से कम एक बार जांच करेगा और इससे संबंधित रिकॉर्ड रखे जाएंगे।

4. माइक्रोवेविंग के मानक.-

- (1) माइक्रोवेव उपचार को साइटोटॉक्सिक, खतरनाक या रेडियोधर्मी अपशिष्टों, संक्रमित पशु कंकालों, शरीर के अंगों और धातु की बड़ी वस्तुओं के लिए प्रयुक्त नहीं किया जाएगा।
- (2) माइक्रोवेव प्रणाली, प्रभावकारिता परीक्षण या नेमी परीक्षणों के अनुरूप होगी और आपूर्तिकर्ता द्वारा निर्धारित सीमा का प्रचालन शुरू करने से पूर्व एक कार्य-पालन गारंटी प्रदान की जाएगी।
- (3) माइक्रोवेव को प्रत्येक माइक्रोवेव इकाई की अधिकतम डिजाइन क्षमता पर अनुमोदित जैविक सूचक द्वारा सुनिश्चित किए जाने वाले जीवाणु और अन्य रोगजनक जीवों को पूर्णतः और निरंतर रूप से मार देना चाहिए। माइक्रोवेव के लिए जैविक सूचक कम से कम 1×10^4 वियोज्य पट्टी के साथ कूपक या बीजाणु पट्टी का प्रयोग करते हुए दण्डाणु अपक्षयक बीजाणु होगा। जैविक सूचक अपशिष्ट के साथ निर्धारित किए जाएंगे और उन्हीं परिस्थितियों में उजागर किए जाएंगे जैसा-सामान्य शोधन चक्र के दौरान अपशिष्ट के लिए होता है।

5. गहराई में दबाने हेतु मानक.- (1) लगभग दो मीटर गहरा गड्ढा या खाई खोदी जानी चाहिए। इसे अपशिष्ट से आधा भर देना चाहिए और आकी गड्ढे को मिट्टी से भरने से पहले सतह से 50 सेमी अंदर चूना भर देना चाहिए।

- (2) यह सुनिश्चित किया जाना चाहिए कि दबाने वाले स्थल तक जानवरों की कोई पहुंच न हो। जस्तेदार लोहे या तारों के जाल के कवर का उपयोग किया जा सकता है।
- (3) प्रत्येक बार, जब गड्ढे में अपशिष्ट डाला जाता है, तो अपशिष्टों को ढंकने के लिए मिट्टी की 10 से.मी. की परत डाली जाएगी।
- (4) दबाने का कार्य गहन और समर्पित पर्यवेक्षण में किया जाना चाहिए।
- (5) गहराई में दबाने वाला स्थल अपेक्षाकृत अपारगम्य होना चाहिए और स्थल के पास छिछला कुआं नहीं होना चाहिए।
- (6) गड्ढे आवास-स्थल से दूर होने चाहिए और ऐसे अवस्थित होने चाहिए ताकि यह सुनिश्चित हो सके कि सतही जल या भूमि जल में कोई संदूषण न हो। यह क्षेत्र बाढ़ या अपरदन के प्रति प्रवृत्त नहीं होना चाहिए।
- (7) गहराई से दबाने का स्थान, विहित प्राधिकारी द्वारा प्राधिकृत होगा।
- (8) संस्था, गहराई से दबाने के लिए प्रयुक्त सभी गड्ढों का रिकॉर्ड रखेगा।
- (9) भूजल स्तर, गहराई से दबाने वाले गड्ढे के निचले स्तर से कम से कम छः मीटर नीचे होगा।

6. रासायनिक विसंक्रमण की क्षमता के लिए मानक :

माइक्रोबियल विसंक्रमण की क्षमता "लॉग 10 किल" के बराबर मानी जाती है जिसे रासायनिक उपचार से पूर्व और बाद में सूक्ष्मजीवों की जांच की संख्या के लघुगणकों की अंतर के रूप में पारिभाषित किया गया है। रासायनिक विसंक्रमण पद्धतियां रासायनिक उपचार प्रणालियों में बेसिलस सबटिलिस (एटीसीसी 19659) के लिए 4 लॉग 10 कमी या अधिक का प्रदर्शन करेंगी।

7. शुष्क ऊष्मा द्वारा जीवाणुनाशन के लिए मानक :

नुकीले अपशिष्ट को कम से कम 185° सेल्सियस तापमान पर शुष्क ऊष्मा जीवाणुनाशन के द्वारा उपचारित किया जा सकता है, इसमें प्रत्येक चक्र में रहने की अवधि न्यूनतम 150 मिनट होगी जिसमें जीवाणुनाशन की अवधि 90 मिनट होगी। प्रचालन प्रांचलों की मॉनीटरिंग करने के लिए स्वचालित रिकॉर्डिंग प्रणाली होनी चाहिए।

(i) नुकीले अपशिष्ट की जीवाणुनाशन यूनिट की विधिमान्यता जांच

कम से कम लॉग₁₀ 6 बीजाणु प्रति मि.ली. वाली शीशियों का उपयोग करके नुकीले अपशिष्ट की जीवाणुनाशन यूनिट को जैविक सूचक जीओबेसिलस स्टीरोथर्मोफिलस या बेसिलस एट्रोफीयसपोरस को पूर्णतः और सतत रूप से मार देना चाहिए। यह जांच तीन माह में एक बार की जाएगी।

(ii) नेमी जांच

इस बात की जांच करने के लिए कि एक कतिपय तापमान प्राप्त कर लिया गया है, एक ऐसी रासायनिक सूचक पट्टी या टेप का उपयोग किया जा सकता है जो एक विनिर्दिष्ट तापमान पहुंचने पर रंग बदल देती है। यह आवश्यक है कि अपशिष्ट पर एक से अधिक पट्टियों का उपयोग किया जाए ताकि यह सुनिश्चित किया जा सके कि नुकीले अपशिष्टों भीतरी भाग पर्याप्त रूप से विसंक्रमित हो गया है। यह जांच सप्ताह में एक बार की जाएगी और इससे संबंधित रिकॉर्ड रखा जाएगा।

8. द्रव अपशिष्ट के लिए मानक.-

(1) किसी साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा के अधिभोगी या प्रचालक के भवन से उत्सर्जित या उपचारित बहिःस्राव को छोड़े जाने से पहले निम्नलिखित सीमाओं का अनुपालन किया जाना चाहिए -

प्रांचल	अनुमेय सीमाएं
पीएच (pH)	6.5-9.0
निलंबित ठोस	100 मिग्रा/लीटर
तेल और ग्रीस	10 मिग्रा/लीटर
बीओडी	30 मिग्रा/लीटर
सीओडी	250 मिग्रा/लीटर
जैव-परिमाण परीक्षण	100% बहिःस्राव में 96 घंटों के बाद मछली की 90% उत्तर जीविता

(2) बहिःस्राव शोधन संयंत्र अवमल को भस्म करने के लिए साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा को या निपटान के लिए परिसंकटमय अपशिष्ट उपचार, भंडारण और निपटान सुविधा को दिया जाएगा।

अनुसूची-III

[नियम 6 और 9(3) देखें]

विहित प्राधिकरणों और तदनुरूपी कर्तव्यों की सूची

क्र.सं.	प्राधिकरण	तदनुरूपी कर्तव्य	
1.	पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, भारत सरकार	(i)	नियमों की अधिसूचना और जब कभी अपेक्षित हो इन नियमों में संशोधनों सहित देश में जैव-चिकित्सा अपशिष्ट प्रबंधन संबंधी नीतियां बनाना।
		(ii)	राज्य प्रदूषण नियंत्रण बोर्डों या प्रदूषण नियंत्रण समितियों के लिए जैव-चिकित्सा अपशिष्ट प्रबंधन संबंधी कार्यकलापों के संबंध में प्रशिक्षण और जागरूकता कार्यक्रमों के लिए वित्तीय सहायता प्रदान करना।
		(iii)	साझा जैव-चिकित्सा अपशिष्ट शोधन और निपटान सुविधाओं की स्थापना या उन्नयन के लिए वित्तीय सहायता प्रदान करना।
		(iv)	जैव-चिकित्सा अपशिष्ट और विगत में अज्ञात निपटान योग्य तथा नए प्रकार के उपस्करों के अपशिष्ट के कारण पर्यावरण और स्वास्थ्य को जोखिमों के संदर्भ में

			अनुसंधान और निर्धारण कार्य शुरू करना और उनमें सहायता करना।
		(v)	नियमों को लागू करने के लिए मॉनीटरिंग समिति गठित करना।
		(vi)	विहित प्राधिकारियों द्वारा दिए गए आदेश के विरुद्ध प्ररूप-V में की गई अपील सुनना और उन पर निर्णय देना।
		(vii)	प्रशिक्षकों के प्रशिक्षण के लिए मानक मैनुअल तैयार करना।
		(viii)	जैव-चिकित्सा अपशिष्ट, अनुसूची-I में सूचीबद्ध को छोड़कर, के शोधन की नई प्रौद्योगिकियों के लिए प्रचालन प्रांचलों के मानक अधिसूचित करना।
2.	केन्द्रीय या राज्य स्वास्थ्य और परिवार कल्याण मंत्रालय, केन्द्रीय पशुपालन और पशु चिकित्सा मंत्रालय या राज्य पशुपालन और पशु चिकित्सा विभाग	(i)	जैव-चिकित्सा अपशिष्ट प्रबंध के लिए विहित प्राधिकारी से प्राधिकार प्राप्त करने के अध्याधीन स्वास्थ्य देखभाल सुविधाओं या नर्सिंग होम या पशु चिकित्सा प्रतिष्ठानों हेतु अनुज्ञाप्ति प्रदान करना।
		(ii)	इन नियमों के अधीन उपबंधों के उल्लंघन के लिए स्वास्थ्य देखभाल सुविधाओं या नर्सिंग होम या पशु चिकित्सा प्रतिष्ठानों हेतु अनुज्ञाप्ति की मॉनीटरिंग, अस्वीकृति या रद्द करना।
		(iii)	जैव-चिकित्सा अपशिष्ट जनन, उपचार और निपटान से संबंधित रजिस्ट्रीकृत स्वास्थ्य देखभाल सुविधाओं की सूची प्रकाशित करना।
		(iv)	जैव-चिकित्सा अपशिष्ट और विगत में अज्ञात निपटान योग्य तथा नए प्रकार के उपस्करों के अपशिष्ट के कारण पर्यावरण और स्वास्थ्य को जोखिमों के संदर्भ में अनुसंधान और निर्धारण कार्य शुरू करना और उनमें सहायता करना।
		(v)	स्वास्थ्य देखभाल सुविधा के कर्मचारिवृन्दों और जैव-चिकित्सा अपशिष्ट से संबंधित म्युनिसिपल कर्मकारों के लिए प्रशिक्षण कार्यक्रमों को आयोजित करने के लिए राज्य प्रदूषण नियंत्रण बोर्डों के साथ समन्वय करना।
		(vi)	जैव-चिकित्सा अपशिष्ट प्रबंधन के लिए स्वच्छ प्रौद्योगिकियों की समग्र समीक्षा और संवर्धन हेतु राष्ट्रीय या राज्य स्तर पर विशेषज्ञ समितियों का गठन करना।

		(vii)	जैव-चिकित्सा अपशिष्ट प्रबंधन संबंधी कार्यकलापों के संबंध में विनियामक प्राधिकारियों के लिए प्रशिक्षणों को आयोजित या प्रायोजित करना।
		(viii)	इलेक्ट्रॉनिक मीडिया और प्रिंट मीडिया में जन जागरूकता अभियानों को प्रयोजित करना।
3.	रक्षा मंत्रालय	(i)	सशस्त्र बल स्वास्थ्य देखभाल सुविधाओं या साझा जैव-चिकित्सा अपशिष्ट उपचार सुविधाओं को प्राधिकार की मंजूरी और नवीकरण (नियम-9)
		(ii)	राज्य प्रदूषण नियंत्रण बोर्डों या प्रदूषण नियंत्रण समितियों या केन्द्रीय प्रदूषण नियंत्रण बोर्ड या पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के सहयोग से सशस्त्र बल स्वास्थ्य देखभाल सुविधाओं या शोधन सुविधाओं में जैव-चिकित्सा अपशिष्टों के प्रबंधन का कार्य करने वाले प्राधिकारियों के लिए प्रशिक्षण पाठ्यक्रमों का आयोजन करना।
		(iii)	अधिभोगियों और सशस्त्र बल स्वास्थ्य देखभाल सुविधाओं या अधिभोगियों से जैव-चिकित्सीय अपशिष्ट के उत्पादन की सूची प्रकाशित करना।
		(iv)	नियमों को लागू करने के लिए सलाहकार समिति गठित करना।
		(v)	अपनी सलाहकार समिति के माध्यम से सशस्त्र बल स्वास्थ्य देखभाल सुविधाओं में जैव-चिकित्सा अपशिष्ट उत्सर्जन के प्रबंधन की समीक्षा (नियम-11)
		(vi)	निर्धारित समयावधि के अंदर केन्द्रीय प्रदूषण बोर्ड को वार्षिक रिपोर्ट को प्रस्तुत करना (नियम 13)
4.	केन्द्रीय प्रदूषण नियंत्रण बोर्ड	(i)	जैव-चिकित्सा प्रबंधन के संबंध में मार्गदर्शक सिद्धान्त तैयार करना और पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय को प्रस्तुत करना।
		(ii)	राज्य प्रदूषण नियंत्रण बोर्डों या प्रदूषण नियंत्रण समितियों के कार्यकलापों का समन्वयन।
		(iii)	जैव-चिकित्सीय अपशिष्ट के प्रबंधन का कार्य करने वाले प्राधिकरणों हेतु प्रशिक्षण पाठ्यक्रमों का आयोजन।

		(iv)	जैव-चिकित्सा अपशिष्ट के उपचार और निपटान हेतु नई प्रौद्योगिकियों के लिए मानकों का निर्धारण करना (नियम-7) तथा जैव-चिकित्सीय अपशिष्टों के उपचार और निपटान हेतु विहित विनिर्देशों का निर्धारण करना (नियम-7)
		(v)	देश में साझा जैव-चिकित्सीय अपशिष्ट उपचार और निपटान सुविधाओं की स्थापना के लिए मानदंड निर्धारित करना।
		(vi)	स्वास्थ्य देखभाल सुविधाओं तथा साझा जैव-चिकित्सीय अपशिष्ट उपचार सुविधाओं का यादृच्छिक निरीक्षण या मॉनीटरिंग करना।
		(vii)	जैव-चिकित्सीय अपशिष्ट के संबंध में राज्य प्रदूषण नियंत्रण बोर्डों द्वारा प्रस्तुत आंकड़ों की समीक्षा और विश्लेषण करना तथा अपनी टिप्पणी के साथ वार्षिक रिपोर्ट के रूप में समेकित सूचना पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को प्रस्तुत करना।
		(viii)	महानिदेशक, सशस्त्र बल चिकित्सा सेवा द्वारा प्रचालित स्वास्थ्य देखभाल सुविधाओं का निरीक्षण और मॉनीटरिंग करना (नियम-9)
		(ix)	जैव-चिकित्सीय अपशिष्ट के बारे में अनुसंधान या प्रचालनात्मक अनुसंधान करना या इसमें सहायता करना।
5.	राज्य सरकार स्वास्थ्य विभाग या संघ राज्य क्षेत्र सरकार प्रशासन	(i)	सभी स्वास्थ्य देखभाल सुविधाओं या अधिभोगियों में इन नियमों का लागू होना सुनिश्चित करना।
		(ii)	जैव-चिकित्सीय अपशिष्ट प्रबंधन हेतु सरकारी स्वास्थ्य देखभाल सुविधाओं को पर्याप्त निधियों का आबंटन।
		(iii)	सरकारी स्वास्थ्य देखभाल सुविधाओं में जैव-चिकित्सीय अपशिष्ट प्रबंधन के लिए शोधन उपस्करों का प्रापण और आबंटन करना, उपभोज्य वस्तु का उपबंध करना।
		(iv)	जिलों में जैव-चिकित्सीय अपशिष्ट प्रबंधन का पर्यवेक्षण करने के लिए जिला मजिस्ट्रेट या सहायक जिला मजिस्ट्रेट के अधीन राज्य या जिला स्तरीय सलाहकार समितियों का गठन करना।

		(v)	इन नियमों के क्रियान्वयन के संबंध में राज्य प्रदूषण नियंत्रण बोर्डों या प्रदूषण नियंत्रण समितियों को सलाह देना।
		(vi)	सलाहकार समितियों की सिफारिशों का सभी स्वास्थ्य देखभाल सुविधाओं में क्रियान्वयन करना।
6.	राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समितियां	(i)	अधिभोगियों और जैव-चिकित्सीय अपशिष्ट के जनन, उपचार और निपटान संबंधी आंकड़ों की सूची बनाना।
		(ii)	आंकड़ों को समेकित करना और निर्धारित समयावधि के अंदर वार्षिक रिपोर्ट में केन्द्रीय प्रदूषण नियंत्रण बोर्ड को प्रस्तुत करना।
		(iii)	इन नियमों के अधीन प्राधिकार की मंजूरी और नवीकरण, निलंबन या अस्वीकृति या रद्दकरण (नियम 7, 8 और 10)
		(iv)	प्राधिकार के विभिन्न उपबंधों और शर्तों के अनुपालन की मॉनीटरिंग।
		(v)	इन नियमों के उल्लंघन के लिए स्वास्थ्य देखभाल सुविधाओं या साझा जैव-चिकित्सीय अपशिष्ट उपचार सुविधाओं के विरुद्ध कार्रवाई (नियम-18)।
		(vi)	जैव-चिकित्सीय अपशिष्टों के पृथक्करण, एकत्रण, भंडारण, परिवहन, उपचार और निपटान के संबंध में स्वास्थ्य देखभाल सुविधाओं या साझा जैव-चिकित्सीय अपशिष्ट उपचार सुविधाओं तथा राज्य प्रदूषण नियंत्रण बोर्डों या प्रदूषण नियंत्रण समितियों के कर्मचारिवृन्दों के लिए प्रशिक्षण कार्यक्रमों का आयोजन।
		(vii)	जैव-चिकित्सीय अपशिष्ट प्रबंधन के संबंध में अनुसंधान या प्रचालनात्मक अनुसंधान करना या उसमें सहायता करना।
		(viii)	इन नियमों के अंतर्गत पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय या केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा समय-समय पर सौंपा गया कोई अन्य कार्य।
		(ix)	सलाहकार समिति की सिफारिशों का क्रियान्वयन।

		(x)	पंजीकृत या प्राधिकृत (या जिन्हें सहमति दी गई है) पुनः चक्रों की सूची प्रकाशित करना।
		(xi)	अपने राज्य में साझा जैव चिकित्सीय अपशिष्ट उपचार सुविधाओं की तृतीय पक्ष द्वारा लेखापरीक्षा कराना और इसमें सहायता करना।
7.	नगरपालिकाएं या निगम, शहरी स्थानीय निकाय और ग्राम पंचायतें	(i)	अपने संबंधित अधिकार क्षेत्र में केन्द्रीय प्रदूषण नियंत्रण बोर्ड के मार्गदर्शक सिद्धान्तों के अनुसार साझा जैव-चिकित्सीय अपशिष्ट उपचार सुविधा के विकास के लिए उपयुक्त भूमि उपलब्ध या आबंटित करना।
		(ii)	नगरीय ठोस अपशिष्ट (प्रबंधन एवं हथालन) नियम, 2000 या समय-समय पर इनमें किए गए संशोधन के अनुसार स्वास्थ्य देखभाल सुविधाओं से अन्य ठोस अपशिष्ट (जैव-चिकित्सीय अपशिष्ट के अलावा) का संग्रहण करना।
		(iii)	इन नियमों के अंतर्गत विनिर्दिष्ट कोई अन्य कार्य।

अनुसूची-IV

[नियम 8(3) और (5) देखें]

भाग क

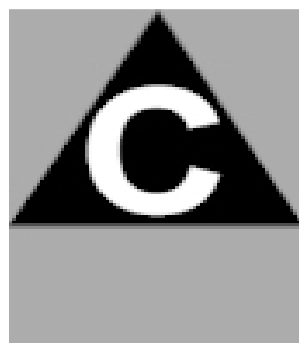
क. जैव-चिकित्सीय अपशिष्ट आधानों/थैलियों के लिए लेबल

बायोहेजार्ड



सावधानीपूर्वक हथालन

साइटोटॉक्सिक हेजार्ड चिह्न



सावधानीपूर्वक हथालन

भाग ख

जैव-चिकित्सीय अपशिष्ट आधानों या थैलियों या आधानों के परिवहन हेतु लेबल

तारीख माह
वर्ष
सृजन की तारीख

अपशिष्ट श्रेणी सं.
अपशिष्ट मात्रा

प्रेषक का नाम और पता
दूरभाष सं.
फैक्स सं.
संपर्क सूत्र

प्राप्तकर्ता का नाम और पता
दूरभाष सं.
फैक्स सं.
संपर्की व्यक्ति

आपात स्थिति में कृपया निम्नलिखित से संपर्क करें
नाम और पता :
दूरभाष सं. :

टिप्पणी : लेबल धूल जाने योग्य नहीं होंगे और प्रमुखता से दिखाई देने वाले होंगे।

प्ररूप 1

[नियम 4(ण), 5(झ) और 15(2) देखें]

दुर्घटना की रिपोर्ट

1. दुर्घटना की तारीख और समय :
2. दुर्घटना का स्वरूप :
3. दुर्घटना होने का घटनाक्रम :
4. क्या प्राधिकरण को तत्काल सूचित किया गया है :
5. दुर्घटना में अंतर्विलित अपशिष्ट का स्वरूप :
6. मानव स्वास्थ्य और पर्यावरण पर दुर्घटनाओं के प्रभावों का निर्धारण :
7. किए गए आपात उपाय :
8. दुर्घटनाओं के प्रभावों का उपशमन करने के लिए उठाए गए कदम :
9. इस प्रकार की दुर्घटना की पुनरावृत्ति को रोकने के लिए उठाए गए कदम :
10. क्या आपकी सुविधा की कोई आपात नियंत्रण नीति है?
यदि हां, तो ब्यौरा दें :

तारीख :

हस्ताक्षर.....

स्थान :

पदनाम

प्ररूप 2

(नियम 10 देखें)

प्राधिकार या प्राधिकार के नवीकरण हेतु आवेदन

(स्वास्थ्य देखभाल सुविधा या साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा के अधिभोगी द्वारा प्रस्तुत किया जाए)
सेवा में

विहित प्राधिकारी,

(राज्य या संघ राज्य क्षेत्र प्रशासन का नाम)

पता

1. आवेदक का विवरण

(i) आवेदक का नाम :

(पूरा नाम स्पष्ट अक्षरों में)

(ii) स्वास्थ्य देखभाल सुविधा (एचसीएफ) या साझा जैव-चिकित्सा अपशिष्ट शोधन सुविधा (सीबीडब्ल्यूटीएफ) का नाम :

(iii) पत्राचार के लिए पता :

(iv) टेलीफोन नं., फैक्स नं. :

(v) ई-मेल :

(vi) वेबसाइट का पता :

2. कार्यकलाप जिसके लिए प्राधिकार मांगा गया है :

कार्यकलाप	कृपया (√) निशान लगाएं
जनन, पृथक्करण	
संग्रहण	
भंडारण	
पैकेजिंग	
प्राप्ति	
परिवहन	
उपचार या प्रसंस्करण या रूपान्तरण	
पुनःचक्रण	
निपटान या नष्ट करना	
उपयोग	
बिक्री, स्थानान्तरण के लिए प्रस्तुत करना	
हथालन का कोई और स्वरूप	

3. आवेदन पत्र □ नए या □ प्राधिकार के नवीकरण के लिए है (कृपया जो लागू हो उसे (√) करें):

(i) नवीकरण के मामले में पिछले प्राधिकार का नम्बर और तारीख

(ii) सहमतियों की स्थिति :

(क) जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1974 के अधीन

(ख) वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 के अधीन

4. (i) स्वास्थ्य देखभाल सुविधा (एचसीएफ) अथवा साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा (सीबीएमडब्ल्यूटीएफ) का पता :

(ii) स्वास्थ्य देखभाल सुविधा (एचसीएफ) अथवा साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा (सीबीएमडब्ल्यूटीएफ) के जीपीएस निर्देशांक :

5. स्वास्थ्य देखभाल सुविधा (एचसीएफ) या साझा जैव चिकित्सा उपचार सुविधा (सीबीएमडब्ल्यूटीएफ) के ब्यौरे :

(i) एचसीएफ के बिस्तरों की संख्या :

(ii) एचसीएफ द्वारा प्रति माह उपचारित रोगियों की संख्या :

(iii) सीबीएमडब्ल्यूटीएफ के अधीन स्वास्थ्य देखभाल सुविधाओं की संख्या : _____

(iv) सीबीएमडब्ल्यूटीएफ के अधीन बिस्तरों की संख्या : _____

(v) सीबीएमडब्ल्यूटीएफ की प्रतिष्ठापित उपचार एवं निपटान क्षमता : ____ किलोग्राम प्रतिदिन

(vi) सीबीएमडब्ल्यूटीएफ द्वारा उपचारित या निपटाए गए जैव-चिकित्सा अपशिष्ट की मात्रा : _____ कि.ग्रा. प्रतिदिन

(vii) सीबीएमडब्ल्यूटीएफ के अधीन क्षेत्रफल और दूरी : _____

(सीबीएमडब्ल्यूटीएफ के स्थान और अधीन आने वाले क्षेत्रफल को दर्शाने वाला नक्शा संलग्न करें)

(viii) हथालन, उपचार या निपटान किए गए जैव-चिकित्सा अपशिष्ट की मात्रा :

श्रेणी	अपशिष्ट का स्वरूप	उत्पादित या संग्रहीत मात्रा (कि.ग्रा. प्रतिदिन)	उपचार और निपटान की पद्धति (अनुसूची-I)
(1)	(2)	(3)	(4)
पीला	(क) मानव शारीरिक रचना अपशिष्ट		
	(ख) पशु शारीरिक रचना अपशिष्ट		

	(ग) ठोस अपशिष्ट		
	(घ) समाप्त या त्यक्त गई दवाएं		
	(ङ.) रासायनिक ठोस अपशिष्ट		
	(च) रासायनिक द्रव अपशिष्ट		
	(छ) फेंकी गई लिनिन, चादरें, बिस्तरें (रक्त या शरीर के द्रव से संदूषित)		
	(ज) सूक्ष्म जीवविज्ञान, जैव-प्रौद्योगिकी और अन्य क्लीनिकल प्रयोगशाला अपशिष्ट		
लाल	संदूषित अपशिष्ट (पुनः चक्रण योग्य)		
सफेद (पारभासी)	धातुओं सहित अपशिष्ट शार्प		
नीला	शीशे के बर्तन		
	मेटालिक बॉडी इम्प्लांट		

6. जैव-चिकित्सा अपशिष्ट के हथालन की व्यवस्थाओं का संक्षिप्त विवरण (ब्यौरा संलग्न करें):

(i) जैव-चिकित्सा अपशिष्ट के परिवहन की पद्धति (यदि कोई हो) :

(ii) शोधन उपस्कर के ब्यौरे :

(कृपया ब्यौरा दें जैसे कि प्रत्येक इकाई की संख्या, प्रकार और क्षमता)

	इकाइयों की संख्या	प्रत्येक इकाई की क्षमता
भस्मन यंत्र		
प्लाज्मा पाइरोलाइसिस		
ऑटोक्लेव		
माइक्रोवेव		
हाइड्रोक्लेव		
श्रेडर		

सूई की नोक काटने वाला नष्ट करने वाला		
शार्प एनकेप्सुलेशन या कंक्रीट पिट:		
डीप बरियल पिट		
रासायनिक विसंक्रमण		
कोई अन्य उपचार उपस्कर		

7. साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा (सीबीएमडब्ल्यूटीएफ) की आपात योजना :

8. पूर्ववर्ती प्राधिकार की अवधि के दौरान निर्देशों या सूचनाओं या विधिक कार्रवाइयों के ब्यौरे, यदि कोई हो :

9. घोषणा :

मैं घोषणा करता हूं कि ऊपर दिए गए विवरण और दी गई सूचना मेरे संपूर्ण ज्ञान और विश्वास के अनुसार सही है तथा मैंने कोई भी सूचना छुपाई नहीं है।

मैं इन नियमों के संबंध में विहित प्राधिकरण द्वारा मांगी गई कोई और सूचना उपलब्ध कराने और विहित प्राधिकरण द्वारा विहित कोई भी शर्त को पूरा करने का भी वचन देता हूं।

तारीख :

आवेदक के हस्ताक्षर

स्थान :

आवेदक का पदनाम

प्ररूप 3
(नियम 10 देखें)
प्राधिकार

(जैव-चिकित्सा अपशिष्टों के जनन, संग्रहण, प्राप्ति, उपचार, भंडारण, परिवहन और निपटान के लिए प्राधिकार)

1. प्राधिकार की फाइल संख्या और जारी करने की तारीख
2. मैसर्स _____ को, जो _____ पर स्थित सुविधा का अधिभोगी या प्रचालक है, निम्नलिखित के लिए प्राधिकार प्रदान किया जाता है;

कार्यकलाप	कृपया (✓) का निशान लगाएं
जनन, पृथक्करण	
संग्रहण	
भंडारण	
पैकेजिंग	
प्राप्त करना	
परिवहन	
उपचार या प्रसंस्करण या रूपान्तरण	
पुनःचक्रण	
निपटान या नष्ट करना	
उपयोग करना	
विक्री, स्थानान्तरण के लिए प्रस्तुत करना	
हथालन का कोई अन्य स्वरूप	

3. मैसर्स _____ को नीचे दी गई क्षमता के अनुसार जैव-चिकित्सा अपशिष्ट का हथालन करने के लिए प्राधिकृत किया जाता है :-

- (i) एचसीएफ के बिस्तरों की संख्या :
- (ii) सीबीएमडब्ल्यूटीएफ के अधीन आने वाली
स्वास्थ्य देखभाल सुविधाओं की संख्या : _____
- (iii) प्रतिष्ठापित उपचार और निपटान क्षमता _____ कि.ग्रा. प्रति दिन

(iv) सीबीएमडब्ल्यूटीएफ के अधीन आने वाला क्षेत्र या दूरी : _____

(v) हथालन, उपचार या निपटान किए गए जैव चिकित्सा अपशिष्ट की मात्रा :

अपशिष्ट के स्वरूप की श्रेणी हथालन के लिए अनुमति दी गई मात्रा

पीला

लाल

सफेद (पारभासी)

नीला

4. यह प्राधिकार जारी किए जाने की तारीख से _____ वर्ष की अवधि के लिए लागू रहेगा।

5. यह प्राधिकार नीचे दी गई शर्तों और पर्यावरण (संरक्षण), अधिनियम, 1986 के तहत वर्तमान में लागू नियमों में यथा विनिर्दिष्ट अन्य शर्तों के अधीन होगा।

तारीख :

हस्ताक्षर.....

स्थान :

पदनाम

प्राधिकार के निबंधन और शर्तें*

1. यह प्राधिकार पर्यावरण (संरक्षण) अधिनियम, 1986 और उसके अधीन बनाए गए नियमों के उपबंधों के अनुपालन में होगा।
2. यह प्राधिकार या इसका नवीकरण, विहित प्राधिकारी द्वारा प्राधिकृत किसी अधिकारी के अनुरोध पर निरीक्षण हेतु प्रस्तुत किया जाएगा।
3. विहित प्राधिकारी की पूर्वानुमति प्राप्त किए बिना प्राधिकृत व्यक्ति द्वारा जैव चिकित्सा अपशिष्टों को किराए पर नहीं दिया जाएगा, उधार नहीं दिया जाएगा; विक्रय नहीं किया जाएगा या अन्तरित या अन्यथा परिवहन नहीं किया जाएगा।
4. प्राधिकृत व्यक्ति द्वारा आवेदन में यथा उल्लिखित कार्मिक, उपस्कर या कार्य स्थितियों में किसी भी अनधिकृत परिवर्तन किए जाने से उसका प्राधिकार भंग हो जाएगा।
5. प्राधिकृत व्यक्ति का कर्तव्य होगा कि वह सुविधा को बंद करने से पहले विहित प्राधिकारी पूर्वानुमति प्राप्त करे और विहित प्राधिकारी द्वारा निर्धारित निबंधन एवं शर्तों का अनुपालन करें।

प्ररूप 4
(देखें नियम-13)
वार्षिक रिपोर्ट

स्वास्थ्य देखभाल सुविधा (एचसीएफ) या साझा जैव चिकित्सा अपशिष्ट उपचार सुविधा (सीबीएमडब्ल्यूटीएफ) के अधिभोगी द्वारा पूर्ववर्ती वर्ष के जनवरी से दिसम्बर माह तक की अवधि के लिए प्रत्येक वर्ष 30 जून को या उससे पहले विहित प्राधिकारी को प्रस्तुत किया जाए

क्र.सं.	विवरण		
1.	अधिभोगी का विवरण		
	(i) प्राधिकृत व्यक्ति का नाम (सुविधा का अधिभोगी या प्रचालक)	:	
	(ii) एचसीएफ या सीबीएमडब्ल्यूटीएफ का नाम	:	
	(iii) पत्राचार के लिए पता	:	
	(iv) सुविधा का पता	:	
	(v) टेलीफोन नं. और फैक्स नं.	:	
	(vi) ई-मेल आईडी	:	
	(vii) वेबसाइट का यूआरएल	:	
	(viii) एचसीएफ या सीबीएमडब्ल्यूटीएफ के जीपीएस कोऑर्डिनेट्स	:	
	(ix) एचसीएफ या सीबीएमडब्ल्यूटीएफ का स्वामित्व	:	(राज्य सरकार या प्राइवेट या अर्द्धसरकारी या कोई अन्य)
	(x) जैव-चिकित्सा अपशिष्ट (प्रबंधन एवं हथालन) नियमों के तहत प्राधिकार की स्थिति	:	प्राधिकार सं. तारीख तक विधिमान्य
	(xi) जल अधिनियम और वायु अधिनियम के तहत सहमतियों की स्थिति	:	दिनांक तक विधिमान्य
2.	स्वास्थ्य देखभाल सुविधा का स्वरूप	:	

	(i) बिस्तर वाला अस्पताल	:	बिस्तरों की संख्या
	(ii) बिना-बिस्तर वाला अस्पताल (क्लीनिक या रक्त बैंक या क्लिनिकल प्रयोगशाला या अनुसंधान संस्थान या पशु अस्पताल या कोई अन्य)	:	
	(iii) अनुज्ञप्ति संख्यांक और इसकी समाप्ति की तारीख	:	
3.	सीबीएमडब्ल्यूटीएफ के ब्यौरे	:	
	(i) सीबीएमडब्ल्यूटीएफ के अधीन आने वाली स्वास्थ्य देखभाल सुविधाओं की संख्या	:	
	(ii) सीबीएमडब्ल्यूटीएफ के अधीन आने वाले बिस्तरों की संख्या	:	
	(iii) सीबीएमडब्ल्यूटीएफ की प्रतिष्ठापित उपचार एवं निपटान क्षमता	:	___ किलोग्राम प्रतिदिन
	(iv) सीबीएमडब्ल्यूटीएफ द्वारा उपचारित या निपटान किए गए जैव-चिकित्सा अपशिष्ट की मात्रा	:	___ किलोग्राम प्रतिदिन
4.	प्रति वर्ष किलोग्राम में जनित या निपटान किए गए अपशिष्ट की मात्रा (मासिक औसत के आधार पर)	:	पीली श्रेणी : लाल श्रेणी : सफेद श्रेणी : नीली श्रेणी : सामान्य ठोस अपशिष्ट:
5.	भंडारण, उपचार, परिवहन, प्रसंस्करण और निपटान सुविधा के ब्यौरे		
	(i) स्थल पर भंडारण सुविधा के ब्यौरे	:	आकार : क्षमता : स्थल पर भंडारण के उपबंध : (कोल्ड स्टोरेज या कोई अन्य व्यवस्था)

(ii) शोधन या निपटान सुविधाओं के ब्यौरे	:	<table><tr><th>शोधन उपस्कर का स्वरूप</th><th>इकाइयों की संख्या</th><th>क्षमता किलोग्राम प्रतिदिन</th><th>प्रतिवर्ष किलोग्राम में उपचार या निपटान की गई मात्रा</th></tr><tr><td>भस्मक</td><td></td><td></td><td></td></tr><tr><td>प्लाजमा पाइरोलाइसिस</td><td></td><td></td><td></td></tr><tr><td>ऑटोक्लेव</td><td></td><td></td><td></td></tr><tr><td>माइक्रोवेव</td><td></td><td></td><td></td></tr><tr><td>हाइड्रोक्लेव</td><td></td><td></td><td></td></tr><tr><td>श्रेडर</td><td></td><td></td><td></td></tr><tr><td>सूई की नोक तोड़ने वाला या नष्ट करने वाला यंत्र</td><td></td><td>-</td><td></td></tr><tr><td>शार्पस् एनकेप्सुलेशन या कंक्रीट पिट</td><td></td><td>-</td><td></td></tr><tr><td>डीप बरियल पिट</td><td></td><td></td><td></td></tr><tr><td>रासायनिक विसंक्रमण</td><td></td><td>-</td><td></td></tr><tr><td>कोई अन्य</td><td></td><td></td><td></td></tr><tr><td>उपचार उपस्कर</td><td></td><td></td><td></td></tr></table>	शोधन उपस्कर का स्वरूप	इकाइयों की संख्या	क्षमता किलोग्राम प्रतिदिन	प्रतिवर्ष किलोग्राम में उपचार या निपटान की गई मात्रा	भस्मक				प्लाजमा पाइरोलाइसिस				ऑटोक्लेव				माइक्रोवेव				हाइड्रोक्लेव				श्रेडर				सूई की नोक तोड़ने वाला या नष्ट करने वाला यंत्र		-		शार्पस् एनकेप्सुलेशन या कंक्रीट पिट		-		डीप बरियल पिट				रासायनिक विसंक्रमण		-		कोई अन्य				उपचार उपस्कर			
	शोधन उपस्कर का स्वरूप	इकाइयों की संख्या	क्षमता किलोग्राम प्रतिदिन	प्रतिवर्ष किलोग्राम में उपचार या निपटान की गई मात्रा																																																		
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	रासायनिक विसंक्रमण		-																																																			
	कोई अन्य																																																					
उपचार उपस्कर																																																						
(iii) उपचार के बाद प्राधिकृत पुनः चक्रकों को बेचे गए पुनःचक्रण योग्य अपशिष्ट की मात्रा, प्रतिवर्ष किलोग्राम में	:	लाल श्रेणी (जैसे कि प्लास्टिक, शीशा आदि)																																																				

	(iv) जैव चिकित्सा अपशिष्ट के संग्रहण एवं परिवहन के लिए उपयोग में लाए गए वाहनों की संख्या	:										
	(v) अपशिष्टों के शोधन के दौरान जनित और निपटान की गई भस्मक की राख और ईटीपी कीचड़ के ब्यौरे, प्रतिवर्ष किलोग्राम में	:	<table border="1"> <tr> <td></td><td>जनित मात्रा</td><td>कहां निपटान किया गया</td></tr> <tr> <td>भस्मक की राख</td><td></td><td></td></tr> <tr> <td>ईटीपी कीचड़</td><td></td><td></td></tr> </table>		जनित मात्रा	कहां निपटान किया गया	भस्मक की राख			ईटीपी कीचड़		
	जनित मात्रा	कहां निपटान किया गया										
भस्मक की राख												
ईटीपी कीचड़												
	(vi) साझा जैव चिकित्सा शोधन सुविधा के प्रचालक का नाम जिसके माध्यम से अपशिष्टों का निपटान किया जाता है	:										
	(vii) ऐसे सदस्य एचसीएफ की सूची जिन्होंने जैव-चिकित्सा अपशिष्ट नहीं सौंपा	:										
6.	क्या आपकी जैव-चिकित्सा अपशिष्ट प्रबंध समिति है? यदि हां, तो रिपोर्ट की अवधि के दौरान आयोजित बैठकों के कार्यवृत्त संलग्न करें।	:										
7.	बीएमडब्ल्यू के संबंध में आयोजित प्रशिक्षणों के ब्यौरे	:										
	(i) बीएमडब्ल्यू प्रबंधन के संबंध में आयोजित प्रशिक्षणों की संख्या	:										
	(ii) प्रशिक्षित कार्मिकों की संख्या	:										
	(iii) भर्ती के समय प्रशिक्षित कार्मिकों की संख्या	:										
	(iv) ऐसे कार्मिकों की संख्या जिन्होंने अभी कोई प्रशिक्षण नहीं लिया है	:										
	(v) क्या प्रशिक्षण के लिए मानक मैनुअल उपलब्ध है?	:										
	(vi) अन्य कोई सूचना	:										

8.	वर्ष के दौरान हुई दुर्घटनाओं के ब्यौरे	:	
	(i) घटित हुई दुर्घटनाओं की संख्या	:	
	(ii) प्रभावित हुए व्यक्तियों की संख्या	:	
	(iii) की गई सुधारात्मक कार्रवाई (कृपया ब्यौरे, यदि कोई हो तो संलग्न करें)	:	
	(iv) क्या कोई मौत भी हुई है? ब्यौरे दें।	:	
9.	क्या आप भस्मक से होने वाले वायु प्रदूषण के मानकों को पूरा करते हैं? विगत वर्ष में कितनी बार आप मानकों को पूरा नहीं कर सके?	:	
	प्रतिष्ठापित की गई सतत् ऑनलाइन उत्सर्जन मॉनीटरिंग प्रणालियों का विवरण	:	
10.	संचित द्रव अपशिष्ट और स्थापित उपचार पद्धतियां। एक वर्ष में आपने कितनी बार मानकों को पूरा नहीं किया है?	:	
11.	क्या विसंक्रमण या जीवाणुनाशन की पद्धति लॉग 4 के मानकों को पूरा करती है? एक वर्ष में आपने कितनी बार मानकों को पूरा नहीं किया है?	:	
12.	अन्य कोई सुसंगत सूचना	:	(भस्मक के साथ संलग्न की गई वायु प्रदूषण नियंत्रण पद्धतियां)

प्रमाणित किया जाता है कि उपर्युक्त रिपोर्ट _____ से _____ तक की अवधि की है।

.....

संस्था के प्रमुख का नाम और हस्ताक्षर

तारीख :

स्थान :

प्ररूप 5
(नियम 16 देखें)

विहित प्राधिकारी द्वारा जारी आदेश के विरुद्ध अपील दायर करने के लिए आवेदन

1. अपील हेतु आवेदन करने वाले व्यक्ति का नाम और पता :
2. आदेश की संख्या, तारीख और आदेश पारित करने वाले प्राधिकारी का पता जिसके विरुद्ध अपील की जा रही है (आदेश की प्रमाणित प्रति संलग्न करें)
3. अपील किए जाने का आधार
4. पैरा 2 में निर्दिष्ट ऐसे आदेश से भिन्न, जिसके विरुद्ध अपील की गई है, संलग्नकों की सूची।

तारीख

हस्ताक्षर

नाम और पता

[फा. सं.3-1/2000-एचएसएमडी]

विश्वनाथ सिन्हा, संयुक्त सचिव

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 28th March, 2016

G.S.R. 343(E).—Whereas the Bio-Medical Waste (Management and Handling) Rules, 1998 was published *vide* notification number S.O. 630 (E) dated the 20th July, 1998, by the Government of India in the erstwhile Ministry of Environment and Forests, provided a regulatory frame work for management of bio-medical waste generated in the country;

And whereas, to implement these rules more effectively and to improve the collection, segregation, processing, treatment and disposal of these bio-medical wastes in an environmentally sound management thereby, reducing the bio-medical waste generation and its impact on the environment, the Central Government reviewed the existing rules;

And whereas, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government published the draft rules in the Gazette *vide* number G.S.R. 450 (E), dated the 3rd June, 2015 inviting objections or suggestions from the public within sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;

And whereas, the copies of the Gazette containing the said draft rules were made available to the public on the 3rd June, 2015;

And whereas, the objections or comments received within the specified period from the public in respect of the said draft rules have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by section 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), and in supersession of the Bio-Medical Waste (Management and Handling) Rules, 1998, except as respects things done or omitted to be done before such suppression, the Central Government hereby makes the following rules, namely:-

1. Short title and commencement.- (1) these rules may be called the Bio-Medical Waste Management Rules, 2016.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Application.-

(1) These rules shall apply to all 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, ayush 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.

(2). These rules shall not apply to,-

- (a) radioactive wastes as covered under the provisions of the Atomic Energy Act, 1962(33 of 1962) and the rules made there under;
- (b) hazardous chemicals covered under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 made under the Act;

- (c) solid wastes covered under the Municipal Solid Waste (Management and Handling) Rules, 2000 made under the Act;
- (d) the lead acid batteries covered under the Batteries (Management and Handling) Rules, 2001 made under the Act;
- (e) hazardous wastes covered under the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 made under the Act;
- (f) waste covered under the e-Waste (Management and Handling) Rules, 2011 made under the Act; and
- (g) hazardous micro organisms, genetically engineered micro organisms and cells covered under the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Micro organisms or Cells Rules, 1989 made under the Act.

3. Definitions.- In these rules, unless the context otherwise requires, -

- (a) "Act" means the Environment (Protection) Act, 1986 (29 of 1986);
- (b) "animal house" means a place where animals are reared or kept for the purpose of experiments or testing;
- (c) "authorisation" means permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, processing, disposal or any other form of handling of bio-medical waste in accordance with these rules and guidelines issued by the Central Government or Central Pollution Control Board as the case may be;
- (d) "authorised person" means an occupier or operator authorised by the prescribed authority to generate, collect, receive, store, transport, treat, process, dispose or handle bio-medical waste in accordance with these rules and the guidelines issued by the Central Government or the Central Pollution Control Board, as the case may be;
- (e) "biological" means any preparation made from organisms or micro-organisms or product of metabolism and biochemical reactions intended for use in the diagnosis, immunisation or the treatment of human beings or animals or in research activities pertaining thereto;
- (f) "bio-medical waste" means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps, including the categories mentioned in Schedule I appended to these rules;
- (g) "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;
- (h) "Form" means the Form appended to these rules;
- (i) "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;
- (j) "health care facility" means a place where diagnosis, treatment or immunisation of human beings or animals is provided irrespective of type and size of health treatment system, and research activity pertaining thereto;
- (k) "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;
- (l) "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;
- (m) "occupier" means a person having administrative control over the institution and the premises generating bio-medical 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;
- (n) "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;
- (o) "prescribed authority" means the State Pollution Control Board in respect of a State and Pollution Control Committees in respect of an Union territory;
- (p) "Schedule" means the Schedule appended to these rules.

4. 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 and in accordance with these rules;
- (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 as specified in Schedule I, 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 in these rules to the common bio-medical waste treatment facility or for the appropriate treatment and disposal, as the case may be, in the manner as prescribed in Schedule I;
- (c) pre-treat the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or sterilisation on-site in the manner as prescribed by the World Health Organisation (WHO) or National AIDS Control Organisation (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 within two years from the date of notification of these rules;
- (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 and thereafter at least once every year and the details of training programmes conducted, number of personnel trained and number of personnel not undergone any training shall be provided in the Annual Report;
- (h) immunise all its health care workers and others, involved in handling of bio-medical waste for protection against diseases including Hepatitis B and Tetanus that are likely to be transmitted by handling of bio-medical waste, in the manner as prescribed in the National Immunisation Policy or the guidelines of the Ministry of Health and Family Welfare issued from time to time;
- (i) establish a Bar- Code System for bags or containers containing bio-medical waste to be sent out of the premises or place for any purpose within one year from the date of the notification of these rules;
- (j) ensure segregation of liquid chemical waste at source and ensure pre-treatment or neutralisation prior to mixing with other effluent generated from health care facilities;
- (k) ensure treatment and disposal of liquid waste in accordance with the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974);
- (l) 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 equipments;
- (m) conduct health check up at the time of induction and at least once in a year for all its health care workers and others involved in handling of bio- medical waste and maintain the records for the same;
- (n) 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 colour coding as specified in Schedule I;
- (o) 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, (including nil report) in Form I to the prescribed authority **and also** along with the annual report;
- (p) make available the annual report on its web-site and all the health care facilities shall make own website within two years from the date of notification of these rules;
- (q) inform the prescribed authority immediately in case the operator of a facility does not collect the bio-medical waste within the intended time or as per the agreed time;
- (r) 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 and the record of the minutes of the meetings of this committee shall be submitted along with the annual report to the prescribed authority and the healthcare establishments having less than thirty beds shall

designate a qualified person to review and monitor the activities relating to bio-medical waste management within that establishment and submit the annual report;

- (s) maintain all record for operation of incineration, hydro or autoclaving etc., for a period of five years;
- (t) existing incinerators to achieve the standards for treatment and disposal of bio-medical waste as specified in Schedule II for retention time in secondary chamber and Dioxin and Furans within two years from the date of this notification.

5. 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 these rules and guidelines issued by the Central Government or, as the case may be, the central pollution control board from time to time;
- (b) ensure timely collection of bio-medical waste from the occupier as prescribed under these rules;
- (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) undertake appropriate medical examination at the time of induction and at least once in a year and immunise all its workers involved in handling of bio-medical waste for protection against diseases, including Hepatitis B and Tetanus, that are likely to be transmitted while handling bio-medical waste and maintain the records for the same;
- (h) ensure occupational safety of all its workers involved in handling of bio-medical waste by providing appropriate and adequate personal protective equipment;
- (i) 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, (including nil report) in Form I to the prescribed authority **and also** along with the annual report;
- (j) 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;
- (k) allow occupier, who are giving waste for treatment to the operator, to see whether the treatment is carried out as per the rules;
- (l) shall display details of authorisation, treatment, annual report etc on its web-site;
- (m) 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 authorisation or registration from the respective State Pollution Control Board or Pollution Control Committee;
- (n) supply non-chlorinated plastic coloured bags to the occupier on chargeable basis, if required;
- (o) common bio-medical waste treatment facility shall ensure collection of biomedical waste on holidays also;
- (p) maintain all record for operation of incineration, hydro or autoclaving for a period of five years; and
- (q) upgrade existing incinerators to achieve the standards for retention time in secondary chamber and Dioxin and Furans within two years from the date of this notification.

6. Duties of authorities.—The Authority specified in column (2) of Schedule-III shall perform the duties as specified in column (3) thereof in accordance with the provisions of these rules.

7. Treatment and disposal.— (1) Bio-medical waste shall be treated and disposed of in accordance with Schedule I, and in compliance with the standards provided in Schedule-II by the health care facilities and common bio-medical waste treatment facility.

(2) Occupier shall hand over segregated waste as per the Schedule-I to common bio-medical waste treatment facility for treatment, processing and final disposal:

Provided that the lab and highly infectious bio-medical waste generated shall be pre-treated by equipment like autoclave or microwave.

- (3) No occupier shall establish on-site treatment and disposal facility, if a service of common bio-medical waste treatment facility is available at a distance of seventy-five kilometer.
- (4) In cases where service of the common bio-medical waste treatment facility is not available, the Occupiers shall set up requisite biomedical waste treatment equipment like incinerator, autoclave or microwave, shredder prior to commencement of its operation, as per the authorisation given by the prescribed authority.
- (5) Any person including an occupier or operator of a common bio medical waste treatment facility, intending to use new technologies for treatment of bio medical waste other than those listed in Schedule I shall request the Central Government for laying down the standards or operating parameters.
- (6) On receipt of a request referred to in sub-rule (5), the Central Government may determine the standards and operating parameters for new technology which may be published in Gazette by the Central Government.
- (7) Every operator of common bio-medical waste treatment facility shall set up requisite biomedical waste treatment equipments like incinerator, autoclave or microwave, shredder and effluent treatment plant as a part of treatment, prior to commencement of its operation.
- (8) Every occupier shall phase out use of non-chlorinated plastic bags within two years from the date of publication of these rules and after two years from such publication of these rules, the chlorinated plastic bags shall not be used for storing and transporting of bio-medical waste and the occupier or operator of a common bio-medical waste treatment facility shall not dispose of such plastics by incineration and the bags used for storing and transporting biomedical waste shall be in compliance with the Bureau of Indian Standards. Till the Standards are published, the carry bags shall be as per the Plastic Waste Management Rules, 2011.
- (9) 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 such recyclers having valid authorisation or registration from the respective prescribed authority.
- (10) The Occupier or Operator of a common bio-medical waste treatment facility shall maintain a record of recyclable wastes referred to in sub-rule (9) which are auctioned or sold and the same shall be submitted to the prescribed authority as part of its annual report. The record shall be open for inspection by the prescribed authorities.
- (11) The handling and disposal of all the mercury waste and lead waste shall be in accordance with the respective rules and regulations.

8. Segregation, packaging, transportation and storage.-(1) No untreated bio-medical waste shall be mixed with other wastes.

- (2) The bio-medical waste shall be segregated into containers or bags at the point of generation in accordance with Schedule I prior to its storage, transportation, treatment and disposal.
- (3) The containers or bags referred to in sub-rule (2) shall be labeled as specified in Schedule IV.
- (4) Bar code and global positioning system shall be added by the Occupier and common bio-medical waste treatment facility in one year time.
- (5) The operator of common bio-medical waste treatment facility shall transport the bio-medical waste from the premises of an occupier to any off-site bio-medical waste treatment facility only in the vehicles having label as provided in part 'A' of the Schedule IV along with necessary information as specified in part 'B' of the Schedule IV.
- (6) The vehicles used for transportation of bio-medical waste shall comply with the conditions if any stipulated by the State Pollution Control Board or Pollution Control Committee in addition to the requirement contained in the Motor Vehicles Act, 1988 (59 of 1988), if any or the rules made there under for transportation of such infectious waste.
- (7) Untreated human anatomical waste, animal anatomical waste, soiled waste and, biotechnology waste shall not be stored beyond a period of forty –eight hours:

Provided that in case for any reason it becomes necessary to store such waste beyond such a period, the occupier shall take appropriate measures to ensure that the waste does not adversely affect human health and the environment and inform the prescribed authority along with the reasons for doing so.

- (8) Microbiology waste and all other clinical laboratory waste shall be pre-treated by sterilisation to Log 6 or disinfection to Log 4, as per the World Health Organisation guidelines before packing and sending to the common bio-medical waste treatment facility.

9. Prescribed authority.-(1) The prescribed authority for implementation of the provisions of these rules shall be the State Pollution Control Boards in respect of States and Pollution Control Committees in respect of Union territories.

- (2) The prescribed authority for enforcement of the provisions of these rules in respect of all health care establishments including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories and blood banks of the Armed Forces under the Ministry of Defence shall be the Director General, Armed Forces Medical Services, who shall function under the supervision and control of the Ministry of Defence.

- (3) The prescribed authorities shall comply with the responsibilities as stipulated in Schedule III of these rules.

10. Procedure for authorisation.-Every occupier or operator handling bio-medical waste, irrespective of the quantity shall make an application in Form II to the prescribed authority i.e. State Pollution Control Board and Pollution Control Committee, as the case may be, for grant of authorisation and the prescribed authority shall grant the provisional authorisation in Form III and the validity of such authorisation for bedded health care facility and operator of a common facility shall be synchronised with the validity of the consents.

- (1) The authorisation shall be one time for non-bedded occupiers and the authorisation in such cases shall be deemed to have been granted, if not objected by the prescribed authority within a period of ninety days from the date of receipt of duly completed application along with such necessary documents.

- (2) In case of refusal of renewal, cancellation or suspension of the authorisation by the prescribed authority, the reasons shall be recorded in writing:

Provided that the prescribed authority shall give an opportunity of being heard to the applicant before such refusal of the authorisation.

- (3) Every application for authorisation shall be disposed of by the prescribed authority within a period of ninety days from the date of receipt of duly completed application along with such necessary documents, failing which it shall be deemed that the authorisation is granted under these rules.

- (4) In case of any change in the bio-medical waste generation, handling, treatment and disposal for which authorisation was earlier granted, the occupier or operator shall intimate to the prescribed authority about the change or variation in the activity and shall submit a fresh application in Form II for modification of the conditions of authorisation.

11. Advisory Committee.-(1) Every State Government or Union territory Administration shall constitute an Advisory Committee for the respective State or Union territory under the chairmanship of the respective health secretary to oversee the implementation of the rules in the respective state and to advice any improvements and the Advisory Committee shall include representatives from the Departments of Health, Environment, Urban Development, Animal Husbandry and Veterinary Sciences of that State Government or Union territory Administration, State Pollution Control Board or Pollution Control Committee, urban local bodies or local bodies or Municipal Corporation, representatives from Indian Medical Association, common bio-medical waste treatment facility and non-governmental organisation.

- (2) Notwithstanding anything contained in sub-rule (1), the Ministry of Defence shall constitute the Advisory Committee (Defence) under the chairmanship of Director General of Health Services of Armed Forces consisting of representatives from the Ministry of Defence, Ministry of Environment, Forest and Climate Change, Central Pollution Control Board, Ministry of Health and Family Welfare, Armed Forces Medical College or Command Hospital.

- (3) The Advisory Committee constituted under sub-rule (1) and (2) shall meet at least once in six months and review all matters related to implementation of the provisions of these rules in the State and Armed Forces Health Care Facilities, as the case may be.

- (4) The Ministry of Health and Defence may co-opt representatives from the other Governmental and non-governmental organisations having expertise in the field of bio-medical waste management.

12. Monitoring of implementation of the rules in health care facilities.- (1) The Ministry of Environment, Forest and Climate Change shall review the implementation of the rules in the country once in a year through the State Health Secretaries and Chairmen or Member Secretary of State Pollution Control Boards and Central Pollution Control Board and the Ministry may also invite experts in the field of bio-medical waste management, if required.

- (2) The Central Pollution Control Board shall monitor the implementation of these rules in respect of all the Armed Forces health care establishments under the Ministry of Defence.

- (3) The Central Pollution Control Board along with one or more representatives of the Advisory Committee constituted under sub-rule (2) of rule 11, may inspect any Armed Forces health care establishments after prior intimation to the Director General Armed Forces Medical Services.
 - (4) Every State Government or Union territory Administration shall constitute District Level Monitoring Committee in the districts under the chairmanship of District Collector or District Magistrate or Deputy Commissioner or Additional District Magistrate to monitor the compliance of the provisions of these rules in the health care facilities generating bio-medical waste and in the common bio-medical waste treatment and disposal facilities, where the bio-medical waste is treated and disposed of.
 - (5) The District Level Monitoring Committee constituted under sub-rule (4) shall submit its report once in six months to the State Advisory Committee and a copy thereof shall also be forwarded to State Pollution Control Board or Pollution Control Committee concerned for taking further necessary action.
 - (6) The District Level Monitoring Committee shall comprise of District Medical Officer or District Health Officer, representatives from State Pollution Control Board or Pollution Control Committee, Public Health Engineering Department, local bodies or municipal corporation, Indian Medical Association, common bio-medical waste treatment facility and registered non-governmental organisations working in the field of bio-medical waste management and the Committee may co-opt other members and experts, if necessary and the District Medical Officer shall be the Member Secretary of this Committee.
13. **Annual report.**-(1) Every occupier or operator of common bio-medical waste treatment facility shall submit an annual report to the prescribed authority in Form-IV, on or before the 30th June of every year.
- (2) The prescribed authority shall compile, review and analyse the information received and send this information to the Central Pollution Control Board on or before the 31st July of every year.
 - (3) The Central Pollution Control Board shall compile, review and analyse the information received and send this information, along with its comments or suggestions or observations to the Ministry of Environment, Forest and Climate Change on or before 31st August every year.
 - (4) The Annual Reports shall also be available online on the websites of Occupiers, State Pollution Control Boards and Central Pollution Control Board.
14. **Maintenance of records.**-(1) Every authorised person shall maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal or any other form of handling of bio-medical waste, for a period of five years, in accordance with these rules and guidelines issued by the Central Government or the Central Pollution Control Board or the prescribed authority as the case may be.
- (2) All records shall be subject to inspection and verification by the prescribed authority or the Ministry of Environment, Forest and Climate Change at any time.
15. **Accident reporting.**-(1) In case of any major accident at any institution or facility or any other site while handling bio-medical waste, the authorised person shall intimate immediately to the prescribed authority about such accident and forward a report within twenty-four hours in writing regarding the remedial steps taken in Form I.
- (2) Information regarding all other accidents and remedial steps taken shall be provided in the annual report in accordance with rule 13 by the occupier.
16. **Appeal.**-(1) Any person aggrieved by an order made by the prescribed authority under these rules may, within a period of thirty days from the date on which the order is communicated to him, prefer an appeal in Form V to the Secretary (Environment) of the State Government or Union territory administration .
- (2) Any person aggrieved by an order of the Director General Armed Forces Medical Services under these rules may, within thirty days from the date on which the order is communicated to him, prefer an appeal in Form V to the Secretary, Ministry of Environment, Forest and Climate Change.
 - (3) The authority referred to in sub-para (1) and (2) as the case may be, may entertain the appeal after the expiry of the said period of thirty days, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.
 - (4) The appeal shall be disposed of within a period of ninety days from the date of its filing.
17. **Site for common bio-medical waste treatment and disposal facility.**-(1) Without prejudice to rule 5 of these rules, the department in the business allocation of land assignment shall be responsible for providing suitable site for setting up of common biomedical waste treatment and disposal facility in the State Government or Union territory Administration.

- (2) The selection of site for setting up of such facility shall be made in consultation with the prescribed authority, other stakeholders and in accordance with guidelines published by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board.

18. **Liability of the occupier, operator of a facility.**- (1) The occupier or an operator of a common bio-medical waste treatment facility shall be liable for all the damages caused to the environment or the public due to improper handling of bio- medical wastes.

- (2) The occupier or operator of common bio-medical waste treatment facility shall be liable for action under section 5 and section 15 of the Act, in case of any violation.

SCHEDULE I

[See rules 3 (e), 4(b), 7(1), 7(2), 7(5), 7 (6) and 8(2)]

Part-1

Biomedical wastes categories and their segregation, collection, treatment, processing and disposal options

Category	Type of Waste	Type of Bag or Container to be used	Treatment and Disposal options
(1)	(2)	(3)	(4)
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 coloured non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or deep burial*
	(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.		Incineration or Plasma Pyrolysis or deep burial* In absence of above facilities, autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery.

	(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 coloured non-chlorinated plastic bags or containers	Expired cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature $>1200^{\circ}\text{C}$ or to common bio-medical waste treatment facility or hazardous waste treatment, storage and disposal facility for incineration at $>1200^{\circ}\text{C}$ Or Encapsulation or Plasma Pyrolysis at $>1200^{\circ}\text{C}$. All other discarded medicines shall be either sent back to manufacturer or disposed by incineration.
	(e) Chemical Waste: Chemicals used in production of biological and used or discarded disinfectants.	Yellow coloured containers or non-chlorinated plastic bags	Disposed of by incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility.
	(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	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms given in Schedule- III.
	(g) Discarded linen, mattresses, beddings contaminated with blood or body fluid.	Non-chlorinated yellow plastic bags or suitable packing material	Non-chlorinated chemical disinfection followed by incineration or Plasma Pyrolysis or for energy recovery. In absence of above facilities, shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery or incineration or Plasma Pyrolysis.
	(h) Microbiology, Biotechnology and other clinical laboratory waste: Blood bags, Laboratory cultures, stocks or specimens of micro-organisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of	Autoclave safe plastic bags or containers	Pre-treat to sterilize with non-chlorinated chemicals on-site as per National AIDS Control Organisation or World Health Organisation guidelines thereafter for Incineration.

	biological, residual toxins, dishes and devices used for cultures.		
Red	Contaminated Waste (Recyclable) (a) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and <i>fixed needle syringes</i>) and vaccutainers with their needles cut) and gloves.	Red coloured non-chlorinated plastic bags or containers	Autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent to 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.
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	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.
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 or microwaving or hydroclaving and then sent for recycling.
	(b) Metallic Body Implants	Cardboard boxes with blue colored marking	

* Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio-medical waste treatment facility. This will be carried out with prior approval from the prescribed authority and as per the Standards specified in Schedule-III. The deep burial facility shall be located as per the provisions and guidelines issued by Central Pollution Control Board from time to time.

Part -2

- (1) All plastic bags shall be as per BIS standards as and when published, till then the prevailing Plastic Waste Management Rules shall be applicable.
- (2) Chemical treatment using at least 10% Sodium Hypochlorite having 30% residual chlorine for twenty minutes or any other equivalent chemical reagent that should demonstrate $\log_{10}4$ reduction efficiency for microorganisms as given in Schedule- III.
- (3) Mutilation or shredding must be to an extent to prevent unauthorized reuse.

- (4) There will be no chemical pretreatment before incineration, except for microbiological, lab and highly infectious waste.
- (5) Incineration ash (ash from incineration of any bio-medical waste) shall be disposed through hazardous waste treatment, storage and disposal facility, if toxic or hazardous constituents are present beyond the prescribed limits as given in the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 or as revised from time to time.
- (6) Dead Fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time) can be considered as human anatomical waste. Such waste should be handed over to the operator of common bio-medical waste treatment and disposal facility in yellow bag with a copy of the official Medical Termination of Pregnancy certificate from the Obstetrician or the Medical Superintendent of hospital or healthcare establishment.
- (7) Cytotoxic drug vials shall not be handed over to unauthorised person under any circumstances. These shall be sent back to the manufactures for necessary disposal at a single point. As a second option, these may be sent for incineration at common bio-medical waste treatment and disposal facility or TSDFs or plasma pyrolysis at temperature $>1200^{\circ}\text{C}$.
- (8) Residual or discarded chemical wastes, used or discarded disinfectants and chemical sludge can be disposed at hazardous waste treatment, storage and disposal facility. In such case, the waste should be sent to hazardous waste treatment, storage and disposal facility through operator of common bio-medical waste treatment and disposal facility only.
- (9) On-site pre-treatment of laboratory waste, microbiological waste, blood samples, blood bags should be disinfected or sterilized as per the Guidelines of World Health Organisation or National AIDS Control Organisation and then given to the common bio-medical waste treatment and disposal facility.
- (10) Installation of in-house incinerator is not allowed. However in case there is no common biomedical facility nearby, the same may be installed by the occupier after taking authorisation from the State Pollution Control Board.
- (11) Syringes should be either mutilated or needles should be cut and or stored in tamper proof, leak proof and puncture proof containers for sharps storage. Wherever the occupier is not linked to a disposal facility it shall be the responsibility of the occupier to sterilize and dispose in the manner prescribed.
- (12) Bio-medical waste generated in households during healthcare activities shall be segregated as per these rules and handed over in separate bags or containers to municipal waste collectors. Urban Local Bodies shall have tie up with the common bio-medical waste treatment and disposal facility to pickup this waste from the Material Recovery Facility (MRF) or from the house hold directly, for final disposal in the manner as prescribed in this Schedule.

SCHEDULE II

[See rule 4(t), 7(1) and 7(6)]

STANDARDS FOR TREATMENT AND DISPOSAL OF BIO-MEDICAL WASTES

1. STANDARDS FOR INCINERATION.-

All incinerators shall meet the following operating and emission standards-

A. Operating Standards

- 1). Combustion efficiency (CE) shall be at least 99.00%.
- 2). The Combustion efficiency is computed as follows:

$$\text{C.E.} = \frac{\% \text{CO}_2}{\% \text{CO}_2 + \% \text{CO}} \times 100$$

- 3). The temperature of the primary chamber shall be a minimum of 800°C and the secondary chamber shall be minimum of 1050°C or $- 50^{\circ}\text{C}$.

4). The secondary chamber gas residence time shall be at least two seconds.

B. Emission Standards

Sl. No.	Parameter	Standards	
(1)	(2)	(3)	(4)
		Limiting concentration in mg Nm ³ unless stated	Sampling Duration in minutes, unless stated
1.	Particulate matter	50	30 or 1NM ³ of sample volume, whichever is more
2.	Nitrogen Oxides NO and NO ₂ expressed as NO ₂	400	30 for online sampling or grab sample
3.	HCl	50	30 or 1NM ³ of sample volume, whichever is more
4.	Total Dioxins and Furans	0.1ngTEQ/Nm ³ (at 11% O ₂)	8 hours or 5NM ³ of sample volume, whichever is more
5.	Hg and its compounds	0.05	2 hours or 1NM ³ of sample volume, whichever is more

C. Stack Height: Minimum stack height shall be 30 meters above the ground and shall be attached with the necessary monitoring facilities as per requirement of monitoring of 'general parameters' as notified under the Environment (Protection) Act, 1986 and in accordance with the Central Pollution Control Board Guidelines of Emission Regulation Part-III.

Note:

- The existing incinerators shall comply with the above within a period of two years from the date of the notification.
- The existing incinerators shall comply with the standards for Dioxins and Furans of 0.1ngTEQ/Nm³, as given below within two years from the date of commencement of these rules.
- All upcoming common bio-medical waste treatment facilities having incineration facility or captive incinerator shall comply with standards for Dioxins and Furans.
- The existing secondary combustion chambers of the incinerator and the pollution control devices shall be suitably retrofitted, if necessary, to achieve the emission limits.
- Wastes to be incinerated shall not be chemically treated with any chlorinated disinfectants.
- Ash from incineration of biomedical waste shall be disposed of at common hazardous waste treatment and disposal facility. However, it may be disposed of in municipal landfill, if the toxic metals in incineration ash are within the regulatory quantities as defined under the Hazardous Waste (Management and Handling and Transboundary Movement) Rules, 2008 as amended from time to time.
- Only low Sulphur fuel like Light Diesel Oil or Low Sulphur Heavy Stock or Diesel, Compressed Natural Gas, Liquefied Natural Gas or Liquefied Petroleum Gas shall be used as fuel in the incinerator.
- The occupier or operator of a common bio-medical waste treatment facility shall monitor the stack gaseous emissions (under optimum capacity of the incinerator) once in three months through a laboratory approved under the Environment (Protection) Act, 1986 and record of such analysis results shall be maintained and submitted to the prescribed authority. In case of dioxins and furans, monitoring should be done once in a year.
- The occupier or operator of the common bio-medical waste treatment facility shall install continuous emission monitoring system for the parameters as stipulated by State Pollution Control Board or Pollution Control Committees in authorisation and transmit the data real time to the servers at State Pollution Control Board or Pollution Control Committees and Central Pollution Control Board.
- All monitored values shall be corrected to 11% Oxygen on dry basis.
- Incinerators (combustion chambers) shall be operated with such temperature, retention time and turbulence, as to achieve Total Organic Carbon content in the slag and bottom ashes less than 3% or their loss on ignition shall be less than 5% of the dry weight.

- (1) The occupier or operator of a common bio-medical waste incinerator shall use combustion gas analyzer to measure CO₂, CO and O₂.

2. **Operating and Emission Standards for Disposal by Plasma Pyrolysis or Gasification:**

A. **Operating Standards:**

All the operators of the Plasma Pyrolysis or Gasification shall meet the following operating and emission standards:

- 1) Combustion Efficiency (CE) shall be at least 99.99%.
- 2) The Combustion Efficiency is computed as follows.

$$\text{C.E} = \frac{\% \text{CO}_2}{(\% \text{CO}_2 + \% \text{CO})} \times 100$$

- 3) The temperature of the combustion chamber after plasma gasification shall be $1050 \pm 50^\circ \text{C}$ with gas residence time of at least 2(two) second, with minimum 3 % Oxygen in the stack gas.
- 4) The Stack height should be minimum of 30 m above ground level and shall be attached with the necessary monitoring facilities as per requirement of monitoring of 'general parameters' as notified under the Environment (Protection) Act, 1986 and in accordance with the CPCB Guidelines of Emission Regulation Part-III.

B. **Air Emission Standards and Air Pollution Control Measures**

- (i) Emission standards for incinerator, notified at SI No.1 above in this Schedule, and revised from time to time, shall be applicable for the Plasma Pyrolysis or Gasification also.
- (ii) Suitably designed air pollution control devices shall be installed or retrofitted with the 'Plasma Pyrolysis or Gasification to achieve the above emission limits, if necessary.
- (iii) Wastes to be treated using Plasma Pyrolysis or Gasification shall not be chemically treated with any chlorinated disinfectants and chlorinated plastics shall not be treated in the system.

C. **Disposal of Ash Vitrified Material:** The ash or vitrified material generated from the 'Plasma Pyrolysis or Gasification shall be disposed off in accordance with the Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 and revisions made thereafter in case the constituents exceed the limits prescribed under Schedule II of the said Rules or else in accordance with the provisions of the Environment (Protection) Act, 1986, whichever is applicable.

3. **STANDARDS FOR AUTOCLAVING OF BIO-MEDICAL WASTE.-**

The autoclave should be dedicated for the purposes of disinfecting and treating bio-medical waste.

- (1) When operating a gravity flow autoclave, medical waste shall be subjected to:
 - (i) a temperature of not less than 121°C and pressure of 15 pounds per square inch (psi) for an autoclave residence time of not less than 60 minutes; or
 - (ii) a temperature of not less than 135°C and a pressure of 31 psi for an autoclave residence time of not less than 45 minutes; or
 - (iii) a temperature of not less than 149°C and a pressure of 52 psi for an autoclave residence time of not less than 30 minutes.
- (2) When operating a vacuum autoclave, medical waste shall be subjected to a minimum of three pre-vacuum pulse to purge the autoclave of all air. The air removed during the pre-vacuum, cycle should be decontaminated by means of HEPA and activated carbon filtration, steam treatment, or any other method to prevent release of pathogen. The waste shall be subjected to the following:
 - (i) a temperature of not less than 121°C and pressure of 15 psi per an autoclave residence time of not less than 45 minutes; or
 - (ii) a temperature of not less than 135°C and a pressure of 31 psi for an autoclave residence time of not less than 30 minutes;
- (3) Medical waste shall not be considered as properly treated unless the time, temperature and pressure indicators indicate that the required time, temperature and pressure were reached during the autoclave process. If for any reasons, time temperature or pressure indicator indicates that the required temperature, pressure or residence time was not

reached, the entire load of medical waste must be autoclaved again until the proper temperature, pressure and residence time were achieved.

(4) **Recording of operational parameters:** Each autoclave shall have graphic or computer recording devices which will automatically and continuously monitor and record dates, time of day, load identification number and operating parameters throughout the entire length of the autoclave cycle.

(5) **Validation test for autoclave:** The validation test shall use four biological indicator strips, one shall be used as a control and left at room temperature, and three shall be placed in the approximate center of three containers with the waste. Personal protective equipment (gloves, face mask and coveralls) shall be used when opening containers for the purpose of placing the biological indicators. At least one of the containers with a biological indicator should be placed in the most difficult location for steam to penetrate, generally the bottom center of the waste pile. The occupier or operator shall conduct this test three consecutive times to define the minimum operating conditions. The temperature, pressure and residence time at which all biological indicator vials or strips for three consecutive tests show complete inactivation of the spores shall define the minimum operating conditions for the autoclave. After determining the minimum temperature, pressure and residence time, the occupier or operator of a common biomedical waste treatment facility shall conduct this test once in three months and records in this regard shall be maintained.

(6) **Routine Test:** A chemical indicator strip or tape that changes colour when a certain temperature is reached can be used to verify that a specific temperature has been achieved. It may be necessary to use more than one strip over the waste package at different locations to ensure that the inner content of the package has been adequately autoclaved. The occupier or operator of a common bio medical waste treatment facility shall conduct this test during autoclaving of each batch and records in this regard shall be maintained.

(7) **Spore testing:** The autoclave should completely and consistently kill the approved biological indicator at the maximum design capacity of each autoclave unit. Biological indicator for autoclave shall be *Geobacillusstearothermophilus* spores using vials or spore Strips; with at least 1×10^6 spores. Under no circumstances will an autoclave have minimum operating parameters less than a residence time of 30 minutes, a temperature less than 121°C or a pressure less than 15 psi. The occupier or operator of a common bio medical waste treatment and disposal facility shall conduct this test at least once in every week and records in this regard shall be maintained.

4. STANDARDS OF MICROWAVING.-

(1) Microwave treatment shall not be used for cytotoxic, hazardous or radioactive wastes, contaminated animal carcasses, body parts and large metal items.

(2) The microwave system shall comply with the efficacy test or routine tests and a performance guarantee may be provided by the supplier before operation of the limit.

(3) The microwave should completely and consistently kill the bacteria and other pathogenic organisms that are ensured by approved biological indicator at the maximum design capacity of each microwave unit. Biological indicators for microwave shall be *Bacillus atrophaeus* spores using vials or spore strips with at least 1×10^4 spores per detachable strip. The biological indicator shall be placed with waste and exposed to same conditions as the waste during a normal treatment cycle.

5. **STANDARDS FOR DEEP BURIAL.-** (1) A pit or trench should be dug about two meters deep. It should be half filled with waste, then covered with lime within 50 cm of the surface, before filling the rest of the pit with soil.

(2) It must be ensured that animals do not have any access to burial sites. Covers of galvanised iron or wire meshes may be used.

(3) On each occasion, when wastes are added to the pit, a layer of 10 cm of soil shall be added to cover the wastes.

(4) Burial must be performed under close and dedicated supervision.

(5) The deep burial site should be relatively impermeable and no shallow well should be close to the site.

(6) The pits should be distant from habitation, and located so as to ensure that no contamination occurs to surface water or ground water. The area should not be prone to flooding or erosion.

(7) The location of the deep burial site shall be authorised by the prescribed authority.

(8) The institution shall maintain a record of all pits used for deep burial.

(9) The ground water table level should be a minimum of six meters below the lower level of deep burial pit.

6. STANDARDS FOR EFFICACY OF CHEMICAL DISINFECTION

Microbial inactivation efficacy is equated to "Log10 kill" which is defined as the difference between the logarithms of number of test microorganisms before and after chemical treatment. Chemical disinfection methods shall demonstrate a 4 Log10 reduction or greater for *Bacillus Subtilis* (ATCC 19659) in chemical treatment systems.

7. STANDARDS FOR DRY HEAT STERILIZATION

Waste sharps can be treated by dry heat sterilization at a temperature not less than 185°C, at least for a residence period of 150 minutes in each cycle, which sterilization period of 90 minutes. There should be automatic recording system to monitor operating parameters.

(i) Validation test for Sharps sterilization unit

Waste sharps sterilization unit should completely and consistently kill the biological indicator *Geobacillus Stearothermophilus* or *Bacillus Atropheauspoers* using vials with at least log₁₀ 6 spores per ml. The test shall be carried out once in three months

(ii) Routine test

A chemical indicator strip or tape that changes colour when a certain temperature is reached can be used to verify that a specific temperature has been achieved. It may be necessary to use more than one strip over the waste to ensure that the inner content of the sharps has been adequately disinfected. This test shall be performed once in week and records in this regard shall be maintained.

8. STANDARDS FOR LIQUID WASTE.-

(1) The effluent generated or treated from the premises of occupier or operator of a common bio medical waste treatment and disposal facility, before discharge into the sewer should conform to the following limits-

PARAMETERS	PERMISSIBLE LIMITS
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.

(2) Sludge from Effluent Treatment Plant shall be given to common bio-medical waste treatment facility for incineration or to hazardous waste treatment, storage and disposal facility for disposal.

Schedule III

[See rule 6 and 9(3)]

List of Prescribed Authorities and the Corresponding Duties

Sl. No. (1)	Authority (2)	Corresponding Duties (3)
1	Ministry of Environment, Forest and Climate Change, Government of India	(i) Making Policies concerning bio-medical waste Management in the Country including notification of Rules and amendments to the Rules as and when required. (ii) Providing financial assistance for training and awareness programmes on bio-medical waste management related activities to for the State Pollution Control Boards or Pollution Control Committees. (iii) Facilitating financial assistance for setting up or up-gradation of common bio-medical waste treatment facilities. (iv) Undertake or support operational research and assessment with reference to risks to environment and health due to bio-medical waste and previously unknown disposables and wastes from new types of equipment. (v) Constitution of Monitoring Committee for implementation of the rules. (vi) Hearing Appeals and give decision made in Form- V against order passed by the prescribed authorities. (vii) Develop Standard manual for Trainers and Training.

		(viii) Notify the standards or operating parameters for new technologies for treatment of bio medical waste other than those listed in Schedule- I.
2	Central or State Ministry of Health and Family Welfare, Central Ministry for Animal Husbandry and Veterinary or State Department of Animal Husbandry and Veterinary.	(i) Grant of license to health care facilities or nursing homes or veterinary establishments with a condition to obtain authorisation from the prescribed authority for bio-medical waste management. (ii) Monitoring, Refusal or Cancellation of license for health care facilities or nursing homes or veterinary establishments for violations of conditions of authorisation or provisions under these Rules. (iii) Publication of list of registered health care facilities with regard to bio-medical waste generation, treatment and disposal. (iv) Undertake or support operational research and assessment with reference to risks to environment and health due to bio-medical waste and previously unknown disposables and wastes from new types of equipment. (v) Coordinate with State Pollution Control Boards for organizing training programmes to staff of health care facilities and municipal workers on bio-medical waste. (vi) Constitution of Expert Committees at National or State level for overall review and promotion of clean or new technologies for bio-medical waste management. (vii) Organizing or Sponsoring of trainings for the regulatory authorities and health care facilities on bio-medical waste management related activities. (viii) Sponsoring of mass awareness campaigns in electronic media and print media.
3	Ministry of Defence	(i) Grant and renewal of authorisation to Armed Forces health care facilities or common bio-medical waste treatment facilities (Rule 9). (ii) Conduct training courses for authorities dealing with management of bio-medical wastes in Armed Forces health care facilities or treatment facilities in association with State Pollution Control Boards or Pollution Control Committees or Central Pollution Control Board or Ministry of Environment, Forest and Climate Change. (iii) Publication of inventory of occupiers and bio-medical waste generation from Armed Forces health care facilities or occupiers (iv) Constitution of Advisory Committee for implementation of the rules. (v) Review of management of bio-medical waste generation in the Armed Forces health care facilities through its Advisory Committee (Rule 11). (vi) Submission of annual report to Central Pollution Control Board within the stipulated time period (Rule 13).
4.	Central Pollution Control Board	(i) Prepare Guidelines on bio-medical waste Management and submit to the Ministry of Environment, Forest and Climate Change. (ii) Co-ordination of activities of State Pollution Control Boards or Pollution Control Committees on bio-medical waste.

		(iii) Conduct training courses for authorities dealing with management of bio-medical waste. (iv) Lay down standards for new technologies for treatment and disposal of bio-medical waste (Rule 7) and prescribe specifications for treatment and disposal of bio-medical wastes (Rule 7). (v) Lay down Criteria for establishing common bio-medical waste treatment facilities in the Country. (vi) Random inspection or monitoring of health care facilities and common bio-medical waste treatment facilities. (vii) Review and analysis of data submitted by the State Pollution Control Boards on bio-medical waste and submission of compiled information in the form of annual report along with its observations to Ministry of Environment, Forest and Climate Change . (viii) Inspection and monitoring of health care facilities operated by the Director General, Armed Forces Medical Services (Rule 9). (ix) Undertake or support research or operational research regarding bio-medical waste.
5.	State Government of Health or Union Territory Government or Administration	(i) To ensure implementation of the rule in all health care facilities or occupiers. (ii) Allocation of adequate funds to Government health care facilities for bio-medical waste management. (iii) Procurement and allocation of treatment equipments and make provision for consumables for bio-medical waste management in Government health care facilities. (iv) Constitute State or District Level Advisory Committees under the District Magistrate or Additional District Magistrate to oversee the bio-medical waste management in the Districts. (v) Advise State Pollution Control Boards or Pollution Control Committees on implementation of these Rules. (vi) Implementation of recommendations of the Advisory Committee in all the health care facilities.
6.	State Pollution Control Boards or Pollution Control Committees	(i) Inventorisation of Occupiers and data on bio-medical waste generation, treatment & disposal. (ii) Compilation of data and submission of the same in annual report to Central Pollution Control Board within the stipulated time period. (iii) Grant and renewal, suspension or refusal cancellation or of authorisation under these rules (Rule 7, 8 and 10). (iv) Monitoring of compliance of various provisions and conditions of authorisation. (v) Action against health care facilities or common bio-medical waste treatment facilities for violation of these rules (Rule 18). (vi) Organizing training programmes to staff of health care facilities and common bio-medical waste treatment facilities and State Pollution Control Boards or Pollution Control Committees Staff on segregation, collection, storage, transportation, treatment and disposal of bio-medical wastes.

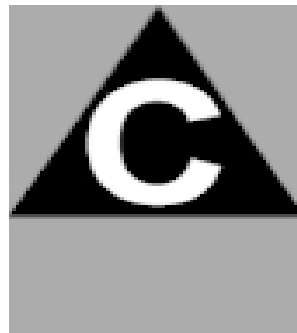
		(vii) Undertake or support research or operational research regarding bio-medical waste management. (viii) Any other function under these rules assigned by Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time. (ix) Implementation of recommendations of the Advisory Committee. (x) Publish the list of Registered or Authorised (or give consent) Recyclers. (xi) Undertake and support third party audits of the common bio-medical waste treatment facilities in their State.
7	Municipalities or Corporations, Urban Local Bodies and Gram Panchayats	(i) Provide or allocate suitable land for development of common bio-medical waste treatment facilities in their respective jurisdictions as per the guidelines of Central Pollution Control Board. (ii) Collect other solid waste (other than the bio-medical waste) from the health care facilities as per the Municipal Solid Waste (Management and handling) Rules, 2000 or as amended time to time. (iii) Any other function stipulated under these Rules.

SCHEDULE IV

[See rule 8(3) and (5)]

Part A**LABEL FOR BIO-MEDICAL WASTE CONTAINERS or BAGS**

HANDLE WITH CARE

CYTOTOXIC HAZARD SYMBOL

HANDLE WITH CARE

Part B**LABEL FOR TRANSPORTING BIO-MEDICAL WASTE BAGS OR CONTAINERS**

Day Month

Year

Date of generation

Waste category Number

Waste quantity.....

Sender's Name and Address

Phone Number

Receiver's Name and Address:

Phone Number

Fax Number.....

Fax Number

Contact Person

Contact Person

In case of emergency please contact :

Name and Address :

Phone No.

Note :Label shall be non-washable and prominently visible.

FORM – I

[(See rule 4(o), 5(i) and 15 (2))]

ACCIDENT REPORTING

1. Date and time of accident :
2. Type of Accident :
3. Sequence of events leading to accident :
4. Has the Authority been informed immediately :
5. The type of waste involved in accident :
6. Assessment of the effects of the accidents on human health and the environment:
7. Emergency measures taken :
8. Steps taken to alleviate the effects of accidents :
9. Steps taken to prevent the recurrence of such an accident :
10. Does your facility has an Emergency Control policy? If yes give details:

Date :

Signature

Place:

Designation

FORM - II

(See rule10)

APPLICATION FOR AUTHORISATION OR RENEWAL OF AUTHORISATION

(To be submitted by occupier of health care facility or common bio-medical waste treatment facility)

To

The Prescribed Authority
(Name of the State or UT Administration)
Address.

1. Particulars of Applicant:

(i) Name of the Applicant:
(In block letters & in full)

(ii) Name of the health care facility (HCF) or common bio-medical waste treatment facility (CBWTF) :

(iii) Address for correspondence:

(iv) Tele No., Fax No.:

(v) Email:

(vi) Website Address:

2. Activity for which authorisation is sought:

Activity	Please tick
Generation, segregation	
Collection,	
Storage	
packaging	
Reception	
Transportation	
Treatment or processing or conversion	
Recycling	
Disposal or destruction	
use	
offering for sale, transfer	
Any other form of handling	

3. Application for ☐ fresh or ☐ renewal of authorisation (please tick whatever is applicable):

(i) Applied for CTO/CTE Yes/No

(ii) In case of renewal previous authorisation number and date:

(iii) Status of Consents:

(a) under the Water (Prevention and Control of Pollution) Act, 1974

(b) under the Air (Prevention and Control of Pollution) Act, 1981:

4. (i) Address of the health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

(ii) GPS coordinates of health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

5. Details of health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

(i) Number of beds of HCF:

(ii) Number of patients treated per month by HCF:

(iii) Number healthcare facilities covered by CBMWTF: _____

(iv) No of beds covered by CBMWTF: _____

(v) Installed treatment and disposal capacity of CBMWTF: _____ Kg per day

(vi) Quantity of biomedical waste treated or disposed by CBMWTF: _____ Kg/ day

(vii) Area or distance covered by CBMWTF: _____

(pl. attach map a map with GPS locations of CBMWTF and area of coverage)

(viii) Quantity of Biomedical waste handled, treated or disposed:

Category	Type of Waste	Quantity Generated or Collected, kg/day	Method of Treatment and Disposal (Refer Schedule-I)
(1)	(2)	(3)	(4)
Yellow	(a) Human Anatomical Waste:		
	(b) Animal Anatomical Waste :		
	(c) Soiled Waste:		
	(d) Expired or Discarded Medicines:		
	(e) Chemical Solid Waste:		
	(f) Chemical Liquid Waste :		

	(g) Discarded linen, mattresses, beddings contaminated with blood or body fluid.		
	(h) Microbiology, Biotechnology and other clinical laboratory waste:		
Red	Contaminated Waste (Recyclable)		
White (Translucent)	Waste sharps including Metals:		
Blue	Glassware:		
	Metallic Body Implants		

6. Brief description of arrangements for handling of biomedical waste (attach details):

- (i) Mode of transportation (if any) of bio-medical waste:
(ii) Details of treatment equipment (please give details such as the number, type & capacity of each unit)

No of units Capacity of each unit

Incinerators :
Plasma Pyrolysis:
Autoclaves:
Microwave:
Hydroclave:
Shredder:
Needle tip cutter or destroyer
Sharps encapsulation or
concrete pit:
Deep burial pits:
Chemical disinfection:
Any other treatment
equipment:

7. Contingency plan of common bio-medical waste treatment facility (CBWTF)(attach documents):

8. Details of directions or notices or legal actions if any during the period of earlier authorisation

9. Declaration

I do hereby declare that the statements made and information given above are true to the best of my knowledge and belief and that I have not concealed any information.

I do also hereby undertake to provide any further information sought by the prescribed authority in relation to these rules and to fulfill any conditions stipulated by the prescribed authority.

Date :

Signature of the Applicant

Place :

Designation of the Applicant

FORM -III

(See rule 10)

AUTHORISATION

(Authorisation for operating a facility for generation, collection, reception, treatment, storage, transport and disposal of biomedical wastes)

1. File number of authorisation and date of issue.....

2. M/s _____ an occupier or operator of the facility located at _____ is hereby granted an authorisation for;

Activity
Generation, segregation
Collection,
Storage
packaging

Please tick

Reception
 Transportation
 Treatment or processing or conversion
 Recycling
 Disposal or destruction
 use
 offering for sale, transfer
 Any other form of handling

3. M/s _____ is hereby authorized for handling of biomedical waste as per the capacity given below;

- (i) Number of beds of HCF:
- (ii) Number healthcare facilities covered by CBMWTF: _____
- (iii) Installed treatment and disposal capacity: _____ Kg per day
- (iv) Area or distance covered by CBMWTF: _____

(v) Quantity of Biomedical waste handled, treated or disposed:

Type of Waste	Category	Quantity permitted for Handling
Yellow		
Red		
White (Translucent)		
Blue		

4. This authorisation shall be in force for a period of Years from the date of issue.

5. This authorisation is subject to the conditions stated below and to such other conditions as may be specified in the rules for the time being in force under the Environment (Protection) Act, 1986.

Date

Signature.....

Place:

Designation

*Terms and conditions of authorisation **

1. The authorisation shall comply with the provisions of the Environment (Protection) Act, 1986 and the rules made there under.
2. The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the prescribed authority.
3. The person authorized shall not rent, lend, sell, transfer or otherwise transport the biomedical wastes without obtaining prior permission of the prescribed authority.
4. Any unauthorised change in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.
5. It is the duty of the authorised person to take prior permission of the prescribed authority to close down the facility and such other terms and conditions may be stipulated by the prescribed authority.

Form - IV

(See rule 13)

ANNUAL REPORT

[To be submitted to the prescribed authority on or before 30th June every year for the period from January to December of the preceding year, by the occupier of health care facility (HCF) or common bio-medical waste treatment facility (CBWTF)]

Sl. No.	Particulars		
1.	Particulars of the Occupier	:	
	(i) Name of the authorised person (occupier or operator of facility)	:	
	(ii) Name of HCF or CBMWTF	:	
	(iii) Address for Correspondence	:	
	(iv) Address of Facility		
	(v) Tel. No, Fax. No	:	
	(vi) E-mail ID	:	
	(vii) URL of Website		
	(viii) GPS coordinates of HCF or CBMWTF		
	(ix) Ownership of HCF or CBMWTF	:	(State Government or Private or Semi Govt. or any other)
	(x). Status of Authorisation under the Bio-Medical Waste (Management and Handling) Rules	:	Authorisation No.: valid up to
	(xi). Status of Consents under Water Act and Air Act	:	Valid up to:
2.	Type of Health Care Facility	:	
	(i) Bedded Hospital	:	No. of Beds:.....
	(ii) Non-bedded hospital (Clinic or Blood Bank or Clinical Laboratory or Research Institute or Veterinary Hospital or any other)	:	
	(iii) License number and its date of expiry		
3.	Details of CBMWTF	:	
	(i) Number healthcare facilities covered by CBMWTF	:	
	(ii) No of beds covered by CBMWTF	:	
	(iii) Installed treatment and disposal capacity of CBMWTF:	:	_____ Kg per day
	(iv) Quantity of biomedical waste treated or disposed by CBMWTF	:	_____ Kg/day
4.	Quantity of waste generated or disposed in Kg per annum (on monthly average basis)	:	Yellow Category : Red Category : White: Blue Category : General Solid waste:
5	Details of the Storage, treatment, transportation, processing and Disposal Facility		
	(i) Details of the on-site storage facility	:	Size : Capacity : Provision of on-site storage : (cold storage or any other provision)

	disposal facilities		Type of treatment equipment	No of units	Capacity Kg/day	Quantity treated or disposed in kg per annum
			Incinerators Plasma Pyrolysis Autoclaves Microwave Hydroclave Shredder Needle tip cutter or destroyer Sharps encapsulation or concrete pit Deep burial pits: Chemical disinfection: Any other treatment equipment:			
	(iii) Quantity of recyclable wastes sold to authorized recyclers after treatment in kg per annum.	:	Red Category (like plastic, glass etc.)			
	(iv) No of vehicles used for collection and transportation of biomedical waste	:				
	(v) Details of incineration ash and ETP sludge generated and disposed during the treatment of wastes in Kg per annum		Incineration Ash ETP Sludge	Quantity generated	Where disposed	
	(vi) Name of the Common Bio-Medical Waste Treatment Facility Operator through which wastes are disposed of	:				
	(vii) List of member HCF not handed over bio-medical waste.					
6	Do you have bio-medical waste management committee? If yes, attach minutes of the meetings held during the reporting period					
7	Details trainings conducted on BMW					
	(i) Number of trainings conducted on BMW Management.					
	(ii) number of personnel trained					
	(iii) number of personnel trained at the time of induction					
	(iv) number of personnel not undergone any training so far					
	(v) whether standard manual for training is available?					
	(vi) any other information)					
8	Details of the accident occurred during the year					

	(i) Number of Accidents occurred		
	(ii) Number of the persons affected		
	(iii) Remedial Action taken (Please attach details if any)		
	(iv) Any Fatality occurred, details.		
9.	Are you meeting the standards of air Pollution from the incinerator? How many times in last year could not met the standards?		
	Details of Continuous online emission monitoring systems installed		
10.	Liquid waste generated and treatment methods in place. How many times you have not met the standards in a year?		
11	Is the disinfection method or sterilization meeting the log 4 standards? How many times you have not met the standards in a year?		
12.	Any other relevant information	:	(Air Pollution Control Devices attached with the Incinerator)

Certified that the above report is for the period from

.....

Name and Signature of the Head of the Institution

Date:

Place

FORM -V

(See rule 16)

Application for filing appeal against order passed by the prescribed authority

1. Name and address of the person applying for appeal :
2. Number, date of order and address of the authority which passed the order, against which appeal is being made (certified copy of order to be attached):
3. Ground on which the appeal is being made:
4. List of enclosures other than the order referred in para 2 against which appeal is being filed:

Signature

Date :

Name and Address.....

[F. No. 3-1/2000-HSMD]

BISHWANATH SINHA, Jt. Secy.

Revised Guidelines for Common Bio-medical Waste Treatment and Disposal Facilities



CENTRAL POLLUTION CONTROL BOARD

(Ministry of Environment, Forest and Climate Change)

Parivesh Bhawan, East Arjun Nagar

DELHI -110 032

website: www.cpcb.nic.in

(December 21, 2016)

Abbreviations

APCD	-	Air Pollution Control Device
BMWM Rules	-	Bio-medical Waste Management Rules
CBWTF	-	Common Bio-medical Waste Treatment and Disposal Facility
CO	-	Carbon Monoxide
CO ₂	-	Carbon Dioxide
CPCB	-	Central Pollution Control Board
CRZ	-	Coastal Regulation Zone
DG	-	Diesel Generator
EC	-	Environmental Clearance
EIA	-	Environment Impact Assessment
ETP	-	Effluent Treatment Plant
GPS	-	Global Positioning System
HCFs	-	Health Care Facilities
HCl	-	Hydrochloric Acid
HOWM & TM Rules	-	Hazardous and Other Waste (Management & Transboundary Movement) Rules, 2016
MHz	-	Mega Hertz
MoEF& CC	-	Ministry of Environment, Forest & Climate Change
KM	-	Kilometer
KW	-	Kilowatt
MoU	-	Memorandum of Understanding
NABL	-	National Accreditation Board for Testing and Laboratories
NO _x	-	Oxides of Nitrogen
O ₂	-	Oxygen
PCC	-	Pollution Control Committee
PLC	-	Programmable Logical Control
SEIAA	-	State Environment Impact Assessment Authority
SLF	-	Secured Landfill
SPCB	-	State Pollution Control Board
TSDF	-	Treatment Storage and Disposal Facility
TOC	-	Total Organic Carbon
VOCs	-	Volatile Organic Compounds

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1) Introduction

A Common Bio-medical Waste Treatment and Disposal Facility (CBWTF) is a set up where biomedical waste generated from member health care facilities is imparted necessary *treatment* to reduce adverse effects that this waste may pose on human health and environment. The treated recyclable waste may finally be sent for disposal in a secured landfill or for recycling.

According to the Bio-medical Waste Management Rules, 2016, "*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 and "*operator of a common bio-medical waste treatment facility*" means a person who owns or controls a Common Bio-medical Waste Treatment and Disposal Facility (CBWTF) for the collection, reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste.

The Bio-medical Waste Management Rules, 2016 (hereafter referred as BMW Rules) restricts occupier for establishment of on-site or captive bio-medical waste treatment and disposal facility, if a service of common bio- medical waste treatment and disposal facility is available within a distance of seventy-five kilometer, as installation of individual treatment facility by health care facility (HCF) requires comparatively high capital investment. In addition, it requires separate dedicated and trained skilled manpower and infrastructure development for proper operation and maintenance of treatment systems. The concept of *CBWTF* is not only addresses such problems but also prevents proliferation of treatment technologies in a particular town or city. In turn, it reduces the monitoring pressure on regulatory agencies. By running the treatment equipment at CBWTF to its full capacity, the cost of treatment of per kilogram bio-medical waste gets significantly reduced. Its considerable advantages have made CBWTF popular and proven concept in most part of the world.

The CBWTFs are also required to set up based on the need for ensuring environmentally sound management of bio-medical waste keeping in view the techno-economic feasibility and viable operation of the facility with minimal impact on human health and environment.

Since 1998, the CBWTF as an option for treatment of bio-medical waste also been legally introduced in India. Considering the likely impacts that may cause to the patients undergoing treatment because of operation of the captive treatment

equipment within the health care facilities (HCFs), now the Bio-medical Waste Management Rules, 2016 restricts the Occupier (i.e., HCF) for ensuring treatment and disposal of generated bio-medical waste through a CBWTF, located within a distance of 75 KM. Further, these rules eased the bottleneck in upbringing the CBWTF by making department in the business allocation of land assignment in the State or UT administration responsible for providing a suitable site (s) within its jurisdiction.

The concept of CBWTF is also being widely accepted in India among the healthcare units, medical associations and entrepreneurs. In order to set up a CBWTF to its maximum perfection, care shall be taken in choosing the right technology, development of CBWTF area, proper designing of transportation system to achieve optimum results etc. Key features of CBWTF have been addressed in the subsequent sections.

To facilitate the treatment and disposal of bio-medical waste generated from the HCFs, at present (as per Annual Report 2014 submitted by the SPCBs/PCCs), there are 192 no. of CBWTFs in operation and 33 no. of CBWTFs are under construction. Also, the Bio-medical Waste Management Rules, 2016 mandates that the operator of a CBWTF authorised by the prescribed authority is required to 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 the BMW Rules and the guidelines issued by the Central Government or the Central Pollution Control Board (CPCB) from time to time. Therefore, these guidelines have been prepared with an aim to have uniformity in ensuring site selection, allowing and establishment of a state-of-the-art CBWTF, operation as well as verification of compliance to the BMW Rules, 2016 throughout the country. However, any other aspects which are not been covered under these guidelines and needs attention, in such a case, the prescribed authority may take suitable action in the interest of protection of the environment in consultation with MoEF & CC/CPCB. Also, it is pertinent to mention here that these guidelines are mandatory henceforth under the Bio-medical Waste Management Rules, 2016

2) Criteria for development of a new Common Bio-medical Waste Treatment and Disposal Facility for a locality or region.

Prior to allowing any new CBWTF, following criteria or steps may be followed:

- a) Prescribed authority under the BMW Rules, 2016 [i.e., State Pollution Control Board (SPCB) in the respective State or Pollution Control Committee (PCC) in the respective

Union Territory Administration] is required to prepare an inventory or review with regard to the bio-medical waste generation at least once in five years in the coverage areas of the existing bio-medical waste treatment and disposal facility. The prescribed authority is also required to extrapolate the coverage-area wise bio-medical waste generation for the next ten years.

- b) SPCB/PCC is required to conduct gap analysis w.r.to coverage area of the bio-medical waste generation and also projected over a period of next ten years, adequacy of existing treatment capacity of the CBWTF in each coverage area of radius 75 KM, as given in **Annexure-I**.

All the SPCBs and PCCs shall conduct the gap analysis and based on the gap analysis, action plan for development of new CBWTFs is required to be prepared and submitted to MoEF & CC & CPCB within six months' time. In case of States/UTs, where no CBWTF is available, in such a case, SPCB/PCC being prescribed authority under the BMW Rules is required to submit the detailed proposal to MoEF & CC/MoH & FW through the respective State Government or UT Administration. Also, the option of forming association by the group of health care facilities (HCFs) to develop their own CBWTF also be encouraged following these guideline. In case, any coverage area requires additional treatment capacity, in such a case, action may be initiated by the prescribed authority for allowing a new CBWTF in that locality without interfering the coverage area of the existing CBWTF and beds covered by the existing CBWTF.

- c) SPCB/PCC shall identify the coverage area, which require additional treatment facility and bring it to the notice of the concerned department in the business allocation of land assignment in the respective State Government or UT Administration. The department in the business allocation of land assignment shall be responsible for providing suitable site in the identified coverage area for setting up of a CBWTF, in consultation with the prescribed authority (i.e., SPCB/PCC), other stakeholders and in accordance with these guidelines issued by CPCB from time to time.
- d) Alternately, a CBWTF may also be allowed to be established on a land procured by an entrepreneur in accordance with the location criteria suggested under these guidelines.
- e) The SPCB/PCC or concerned department in the business allocation of land assignment in the respective State Government or UT Administration may seek expression of interest from the proponents for development of new CBWTF (s) in the identified coverage area. Upon allocation of site to the proponent, the proponent is

required to take necessary approvals as required under the Environment (Protection) Act, 1986 for development of the new CBWTF in accordance with these guidelines.

- f) In the absence of expression of interest by any proponent, then SPCB/PCC shall insist health care facilities to form association and to develop its own CBWTF in line with these guidelines or to have captive treatment facilities for ensuring treatment and disposal of generated bio-medical waste as stipulated under the BMWWM Rules, 2016.
- g) In case of any regulatory action including closure of any existing CBWTF is inevitable, the respective SPCB/PCC may take action under the BMWWM Rules including for making alternate arrangement to ensure safe disposal of the bio-medical waste generated from the member health care facilities of such default CBWTF through CBWTF located nearby.
- h) In case of hilly areas considering the geography, only one CBWTF with adequate treatment capacity may be developed covering atleast two districts to cater treatment services to the HCFs located in the respective Districts. The selection and allocation of site etc., should be done as per the criteria suggested under these guidelines. The treatment charges to be prescribed by the respective SPCB/PCC in consultation with the State Advisory Committee.

The criteria for development of CBWTFs in any coverage area is also depicted in **Figure 1**.

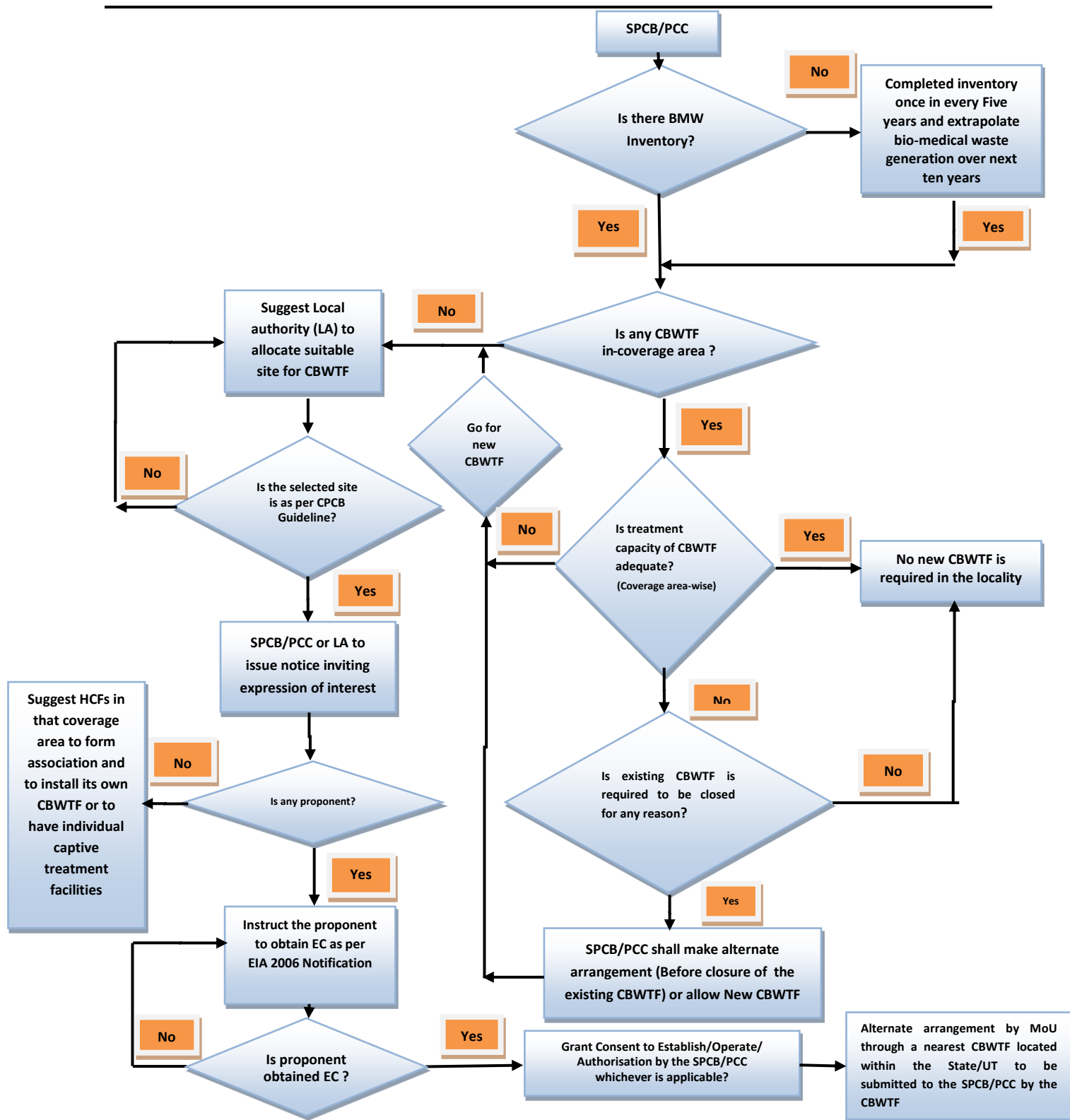


Figure 1. Criteria for Development of a CBWTF in a coverage area

3) **Duties of the operator of a common bio-medical waste treatment and disposal facility**

The duties of the operator of a common bio-medical waste treatment and disposal facility (CBWTF) as enunciated under Rule 5 of the Bio-medical Waste Management Rules, 2016 shall be ensured and complied with. Also, all the existing CBWTFs shall also complete augmentation of the existing incineration facility so as to comply w.r.to the residence time as well as emission norms including for Dioxins and Furans prescribed under BMWM Rules, 2016 within two years from the date of notification of the BMWM Rules, 2016 (i.e., prior to 27.03.2018). In addition to the above, to ensure proper management of bio-medical waste in the respective coverage area, as a mitigation measure, especially in the event of

- (a) a temporary break down (not more than a week) of a CBWTF especially for rectification of the refractory lining of the incineration chambers or change of requisite APCD due to failure; and
- (b) Closure of a CBWTF for violation of the provisions of the BMWM Rules or any other reason.

Prior to commencement of a new CBWTF as well as all the existing CBWTF Operators are required to submit action plan, to the respective SPCB/PCC, for imposing suitable condition while granting authorisation under the BMWM Rules, 2016. The action plan should also include:

- (a) a MoU made with the nearest CBWTF located within the respective State/UT, as alternate arrangement. In case, if there is no CBWTF located nearby then such CBWTF should have to install stand by treatment equipment (equal to the existing treatment capacity as per consents granted by the SPCB/PCC), and
- (b) decontamination plan of the CBWTF for execution of such plan prior to closure of a CBWTF.

4) **Applicability of these guidelines**

These guidelines are applicable to all the upcoming or new CBWTFs. In case of the existing CBWTFs, these guidelines shall be applicable in case

- (a) the existing CBWTFs desires to expand or enhance the existing treatment capacity
(or)
 - (b) the existing CBWTFs desires to modernize the existing treatment equipment with the new equipment with enhancement in the existing treatment capacity.
-

5) **Environmental laws applicable for commissioning or operation of a CBWTF**

Operation of a CBWTF leads to air emissions as well as waste water generation as in case of an industrial operation. Most common sources of waste water generation in CBWTFs are vehicle washing, floor washing, and scrubbed liquid effluent from air pollution control systems attached with the incinerator/plasma pyrolysis. Incineration as well as DG Set is the general source of air emissions.

5.1 Any other approvals (such as Land Use /Change in Land Use as applicable) required from the concerned authorities under various laws have to be complied with by the proponent of the CBWTF prior to development of a CBWTF.

5.2 Consents under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 as well as Authorization under the BMW Rules, 2016

The project proponent of the CBWTF is required to obtain 'Consent to Establishment' under Rule 25 of the Water (Prevention and Control of Pollution) Act, 1974 and under Rule 21 of the Air (Prevention and Control of Pollution) Act, 1981, from the respective prescribed authority i.e. SPCB/PCC. Upon installation of the requisite equipment, the CBWTF Operator is also required to obtain authorization under BMW Rules, 2016 co-terminus with consent to operate under Water (Prevention and Control of Pollution) Act, 1976 & Air (Prevention and Control of Pollution) Act, 1981 from the respective SPCB/PCC prior to commencement of the CBWTF.

5.3 Environmental Clearance under EIA Notification 2006

Ministry of Environment, Forest & Climate Change (MoEF & CC), notified amendment to the EIA Notification 2006 and published vide MoEF & CC Notification of S.O. 1142 (E) dated April 17, 2015. According to this notification, the 'bio-medical waste treatment facility' is categorized under the Item 7 (da) in the schedule, requiring 'environmental clearance' from the State Environment Impact Assessment Authority (SEIAA). Therefore, the CBWTF operator is also required to obtain 'Environmental Clearance (EC)' from the respective SEIAA or Ministry of Environment, Forest & Climate Change (MoEF & CC), as the case may be, before any construction work, or preparation of land by the projects management, which include the following:

- a) All new projects or activities pertaining to the bio-medical waste treatment facility; and
- b) Expansion and modernization with additional treatment capacity of existing bio-medical waste treatment facility (excluding augmentation of incineration facility)

for compliance to the residence time as well as Dioxins and Furans without enhancing the existing treatment capacity).

- c) Any expansion or modification in the treatment capacity or relocation of the existing CBWTF (requires compliance to the relevant provisions notified under the Environment (Protection) Act, 1986 by the MoEF & CC

6) Location criteria

In the context of these guidelines, 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 to 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 exist within 150 KM distance from the existing TSDF.

7) Land requirement

Sufficient land shall be allocated to the CBWTF to provide all requisite systems which include dedicated space for storage of waste (both treated and untreated), waste treatment equipment, vehicle washing bay, vehicle parking space, ETP, incineration ash storage provision, administrative room, space for DG Set etc.,.

- (a) Preferably, a CBWTF shall be set up on a plot size of not less than one acre in all the areas. However, a CBWTF can be developed in adjacent plots but cannot be set up in two or more different plots located in different areas. Separate plots can be permitted only for vehicle parking if located in the close vicinity of the proposed CBWTFs or the existing CBWTFs.
- (b) In case of upcoming or new CBWTFs (both in municipal limits with population more than 25 lakhs or in rural areas), the land area requirement may be relaxed (but in any case not less than 0.5 acre) by the SPCB/PCC, with additional control measures such as zero liquid discharge, increase in stack height, stringent emission norms, odour control measures or any other measures felt necessary by the prescribed authority on case-to-case basis, only in consultation with CPCB.

8) Coverage area of CBWTF

Suggested coverage area for development of a CBWTF is as follows:

- a) A CBWTF located within the respective State/UT shall be allowed to cater healthcare units situated at a radial distance of 75 KM. However, in a coverage area where 10,000 beds are not available within a radial distance of 75 KM, existing CBWTF in the locality (located within the respective State/UT) may be allowed to cater the healthcare units situated upto 150 KM radius w.r.to its location provided the bio-medical waste generated is collected, treated and disposed of within 48 hours as stipulated under the BMWM Rules.
- b) In case, number of beds is exceeding >10,000 beds in a locality (i.e. coverage area of the CBWTF under reference) and the existing treatment capacity is not adequate, in such a case, a new CBWTF may be allowed in such a locality in compliance to various provisions notified under the Environment (Protection) Act, 1986, to cater services only to such additional bed strength of the HCFs located.
- c) In case of hilly areas, considering the geography, only one CBWTF with adequate treatment capacity may be developed covering atleast two districts to cater treatment services to the HCFs located in the respective Districts. The selection and allocation of site etc. should be done as per the criteria suggested under these guidelines. The treatment charges to be prescribed by the respective SPCB/PCC in consultation with the State Advisory Committee to be constituted under the BMWM Rules by the respective State Government or UT Administration.

9) Treatment equipment

The Common Bio-medical Waste Treatment Facility should treat the bio-medical waste as per BMWM Rules and as per the authorisation granted by the prescribed authority. The CBWTF should have the following treatment facilities:

a) ***Incineration/Plasma Pyrolysis***

Incineration is a controlled combustion process where waste is completely oxidized and harmful microorganisms present in it are destroyed/ denatured under high temperature. The guidelines for "Design & Construction Requirements of Bio-medical Waste Incinerators" by CPCB from time to time shall be followed for selecting/or augmenting the incinerator.

Plasma Pyrolysis is an alternate to incinerator, Plasma Pyrolysis treatment technology can be installed for disposal of bio-medical waste categories as per BMWM Rules wherein destruction of bio-medical waste is similar to incineration can be achieved. In case of plasma pyrolysis, waste is treated at high temperature under controlled condition to form gases like methane, hydrogen and carbon monoxide which are subjected to combustion (oxidation) in secondary chamber. In the plasma pyrolysis process waste is converted into small clinker which can be disposed in secured landfills.

b) Autoclaving/Hydroclaving

- (i) Autoclaving** is a low-heat thermal process where steam is brought into direct contact with waste in a controlled manner and for sufficient duration to disinfect the wastes as stipulated under the Bio-medical Waste Management Rules. For ease and safety in operation, the system should be horizontal type and exclusively designed for treatment of bio-medical waste. For optimum results, pre-vacuum based system be preferred against the gravity type system. It shall have tamper-proof control panel with efficient display and recording devices for recording critical parameters such as time, temperature, pressure, date and batch number etc. as required under the BMWM Rules.
- (ii) Hydroclaving** is similar to that of autoclaving except that the waste is subjected to indirect heating by applying steam in the outer jacket. The waste is continuously tumbled in the chamber during the process.
- c) Microwaving:** In microwaving, microbial inactivation occurs as a result of the thermal effect of electromagnetic radiation spectrum lying between the frequencies 300 and 300,000MHz. Microwave heating is an inter-molecular heating process. The heating occurs inside the waste material in the presence of steam.
- d) Chemical disinfection:** Though chemical disinfection or alternates as stipulated under the BMWM Rules is also an option for treatment of certain categories of bio-medical waste such as glass waste but looking at the volume of waste to be disinfected at the CBWTF and the pollution load associated with the use of chemical disinfectants, the chemical disinfection for treatment of bio-medical waste as part of a CBWTF may be used sparingly or avoided as far as possible.
- e) Dry heat sterilization:** This is the additional option for treatment of waste sharps as stipulated under the BMWM Rules. In this method, waste sharps are treated using

dry heat (hot air) at a temperature not less than 185°C, at least for a residence period of 150 minutes in each cycle (with sterilization period of 90 minutes).

f) *Shredder:* Shredding is a process by which waste are de-shaped or cut into smaller pieces so as to make the wastes unrecognizable. It helps in prevention of reuse of bio-medical waste and also acts as identifier that the wastes have been disinfected and are safe to dispose off. A shredder to be used for shredding bio-medical waste shall confirm to the following minimum requirements:

- (i) The shredder for bio-medical waste shall be of robust design with minimum maintenance requirement;
- (ii) The shredder should be properly designed and covered to avoid spillage and dust generation. It should be designed such that it has minimum manual handling;
- (iii) The hopper and cutting chamber of the shredder should be so designed to accommodate the waste bag full of bio-medical waste;
- (iv) The shredder blade should be highly resistant and should be able to shred waste sharps, syringes, scalpels, blades, plastics, catheters, intravenous sets/ bottles, blood bags, gloves, bandages etc. It should be able to handle/ shred wet waste, especially after microwave/ autoclave/hydroclave;
- (v) The shredder blade shall be of non-corrosive and hardened steel;
- (vi) The shredder should be so designed and mounted so as not to generate dust, high noise & vibration;
- (vii) If hopper lid or door of collection box is opened, the shredder should stop automatically for safety of operator;
- (viii) In case of shock-loading (non-shreddable material in the hopper), there should be a mechanism to automatically stop the shredder to avoid any emergency/accident;
- (ix) In case of overload or jamming, the shredder should have mechanism of reverse motion of shaft to avoid any emergency/accident;
- (x) The motor shall be connected to the shredder shaft through a gear mechanism, to ensure low rpm and safety;
- (xi) The unit shall be suitably designed for operator safety, mechanical as well as electrical;
- (xii) The shredder should have low rotational speed (maximum 50 rpm). This will ensure better gripping and cutting of the bio-medical waste;

- (xiii) The discharge height (from discharge point to ground level) shall be sufficient (minimum 3 feet) to accommodate the containers for collection of shredded material. This would avoid spillage of shredded material;
- (xiv) The minimum capacity of the motor attached with the shredder shall be 3 KW for 50 Kg/hr, 5 KW for 100 kg/hr & 7.5 KW for 200 Kg/hr and shall be three phase induction motor. This will ensure efficient cutting of the bio-medical wastes as prescribed in the Bio-medical Waste Management Rules; and
- (xv) The shredder also should be fitted with separate 'energy meter' for recording total energy consumed for operation of this equipment.

g) *Sharp pit/ Encapsulation:* A sharp pit or a facility for sharp encapsulation in a metal container or cement concrete shall be provided for treated sharps (*i.e., treatment by autoclaving or dry heat sterilization followed by shredding or mutilation*). An option may also be worked out for recovery of metal from treated and shredded waste sharps within the CBWTF or iron foundries having consent to operate from the SPCBs/PCCs and located nearby, as per the conditions imposed in authorization granted under BMWM Rules by the SPCB/PCC.

A sharp pit may be of circular or rectangular shape and shall be dug and lined with cement plastered brick masonry or concrete rings. The pit should be covered with a heavy concrete slab with a provision of galvanized steel pipe projecting about 1.5 meters above the slab, with an internal diameter of up to 50 mm or 1.5 times the length of vials, whichever is more. The top opening of the steel pipe shall have a provision of locking after the treated waste sharps are disposed into the sharp pit. When the pit is full, it can be sealed completely, after another pit is prepared. In case of high water table regions (*i.e., where water table is less than 6 metres beneath the bottom of the sharp pit*), a tank with above mentioned arrangements shall be made above the ground.

h) *Deep burial:* Any SPCB/PCC should not allow the 'deep burial' of bio-medical waste as a part of CBWTF. Any existing CBWTF having disposal of bio-medical waste by deep burial should have the requisite treatment equipment as stipulated under the BMWM Rules, *within six months* from the date of finalization of these guidelines.

i) *Non-burn technology:* Non-incineration technologies for disposal of bio-medical waste are adopted in some of the developed countries. Non-incineration technology comprises of shredding and disinfection by autoclaving/microwaving or chemical treatment. The treated waste can be disposed along with municipal solid waste in sanitary landfills or through waste to energy plants. Such option can also be adopted in places where the sanitary landfill or waste to energy plant for disposal of municipal

solid waste is available. Such technology is permitted only after prior approval of MoEF & CC and only after obtaining authorization under the BMWWM Rules from the respective SPCB/PCC for the purpose of carrying out trial runs for assessment of efficacy of the treatment equipment.

- j) *Vehicle/Containers washing facility:*** Every time a vehicle is unloaded, the vehicle and empty waste containers shall be washed properly and disinfected. Washing can be carried out in an open area but on an impermeable surface and liquid effluent so generated shall be conveyed and treated in an effluent treatment plant. The impermeable area shall be of appropriate size so as to avoid spillage of liquid during washing.
- k) *Effluent Treatment Plant:*** A suitable Effluent Treatment Plant (ETP) shall be installed to ensure that liquid effluent generated during the process of washing containers, vehicles, floors etc. is treated and reused after treatment. Proper treatment of waste water shall be ensured in case of zero discharge by recirculation of treated waste water for scrubbing. *ETP may have treatment unit operations* comprising collection tank, O & G trap, chemical dosing cum mixing (Flash and slow), coagulation chamber, primary settling tank (s), biological treatment process, secondary settling tank, pressure filter and activated carbon filter, pH Correction tank (wherever recirculation of treated water is practiced) *so as to comply* with the liquid discharge standards stipulated under the Bio-medical Waste Management Rules, 2016. ETP may also have the following provisions:
- (i) separate 'energy meter' so as to know total consumption of electricity for operation of the machinery attached with the ETP.
 - (ii) pH meter so as to know pH level of treated water as well as pH level of treated water used for recirculated or recycling in APCD attached with the incinerator or any utility within the CBWTF.
 - (iii) A 'magnetic flow meter' should also be fitted at all the water supply extraction points of the CBWTF as well as the outlet to know the total wastewater treated for further end use or discharge in compliance to the BMWWM Rules.
 - (iv) Provision of 'press filter' to reduce the moisture content of the ETP Sludge or it may be dried in 'sludge drying bed'. After removal of moisture content or drying, same need to be disposed off in an environmentally sound manner depending upon the hazardous constituents present in it as per Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016.

In case, ETP sludge contains metal contents within the prescribed limits as per Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016, such ETP sludge shall be given to CBWTF for incineration or to hazardous waste treatment, storage and disposal facility (TSDF) for disposal in secured landfill.

Note:

- a) If any CBWTF desires to adopt any other technology other than referred under Schedule –I of the BMW Rules, may adopt new technology only with the prior approval from MoEF & CC and is also required to obtain authorization under the BMW Rules from the respective SPCB/PCC for carrying out trial run for assessment of efficacy of the new technology.
- b) All the treatment equipment should be operated and complied with the norms as stipulated under Schedule II of the Bio-medical Waste Management Rules, 2016 published by MoEF & CC vide GSR 343 (E) dated 28th March, 2016.
- c) Incinerator / Plasma Pyrolysis/ Autoclaving/Microwaving/ Hydroclaving/ Shredder/ Dry Heat Sterilization/ ETP should be fitted with separate 'energy meter' for recording total energy consumed for operation of these equipment.
- d) In the event of temporary shutdown (not more than a week) due to any operational problems in the treatment equipment (such as restoration of refractory lining or maintenance or repairs in APCD), to ensure bio-medical waste collected from the member health care facilities is treated within the time limit as stipulated under the BMW Rules, each all the CBWTF operators should also be provided with stand by treatment equipment especially incinerator/plasma pyrolysis/autoclave (or) alternately MoU made with the nearby CBWTF (located within the State/UT) shall be submitted to the respective SPCB/PCC, by all the existing CBWTF operators (whereas the upcoming facilities have to make such arrangement prior to commencement of the facility) so as to include such condition while granting authorisation under the BMW Rules, 2016 to the concerned CBWTF operators (vice-versa).

(10) Infrastructure set up

The CBWTF shall have enough space within it to install required treatment equipment, untreated and treated waste storage area, vehicle-parking, vehicle and containers washing area, Effluent Treatment Plant (ETP), administration room or staff room etc. The required area for CBWTF would depend upon the projected amount of bio-medical waste to be handled by it. A CBWTF shall have the following infrastructure:

a) Treatment Equipment Room

A separate housing may be provided for each treatment equipment at the CBWTF such as incinerator room, autoclave room, microwave room etc., as applicable. Each room shall have well-designed roof and walls. Such room shall be well ventilated and easy to wash. The floor and interior finishing of the room shall be such that chances of sticking/harboring of microorganisms are minimized. This can be attained by

providing smooth & fine floor and wall surfaces (to a height of 2 meter from floor) preferably of tiles. The number of joints in such surfaces shall be minimal. The equipment room shall also have a separate cabin, to supervise the operation of the equipment and to record the waste handling and equipment operational data attached to each equipment room. There shall be two waste storage rooms, one for storage of untreated waste and another for treated waste and may be located at a distance from each other. The storage room shall have provisions similar to that of equipment room being well-ventilated with easy to wash floors & walls, smooth and fine surfaces etc. All the treatment equipment rooms and waste storage rooms should be provided with 'fly catcher/killing device'. The room shall be washed and cleaned with a suitable disinfectant every day.

b) Main waste storage space

Separate space shall be provided near the entry point of the CBWTF to unload and store all biomedical wastes that have been transported to the CBWTF by its own transportation vehicle. The size of the room shall be adequate to store all wastes transported to the CBWTF. The front portion of the room shall be utilized for unloading the wastes from the vehicle and back or side portion shall be utilized for shifting the wastes to the respective treatment equipment. In the front portion of the room where transportation vehicle is parked for unloading, the floor shall be made impermeable so that any liquid spillage during unloading does not percolates into the ground. The liquid generated during handling of wastes and washing, shall be diverted to the inlet of effluent treatment plant (ETP). In the main storage room, wastes shall be stacked with clear distinction as per the color coding of the containers by providing partitions. From here, the colored containers may be sent to the respective treatment equipment by using suitable closed type of conveyance (trolley etc.). The main storage room too shall have provisions similar to that of equipment room such as roofing, well ventilated, easy to wash floors & walls, smooth and fine surfaces etc.

Apart from the above, a CBWTF should have separate storage provision for storage of mercury bearing waste collected from the member health care facilities as per the procedure given in CPCB guidelines. Mercury storage provision should be provided as per the guidelines issued by CPCB (refer www.cpcb.nic.in). The capacity of the mercury storage provision should be maximum of 90 days and by which the collected mercury bearing waste shall have to be disposed of through a TSDF located nearby following the manifest as per Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016. The charges for collection and disposal of

mercury bearing waste shall be collected by the CBWTF from the respective member HCF.

c) Treated waste storage room

Separate space should be provided to store the wastes treated in different treatment units. The wastes shall be stored in separate group as per the disposal options. Other provisions in the room shall be similar to the main storage room. Waste such as incineration ash/vitrified ash generated in the process of incineration/plasma pyrolysis respectively shall be stored safely in a separate area under the shed so as to avoid entry of rain water during the monsoon and for easy collection. In case, incineration ash/ vitrified ash is found to be hazardous waste in nature same should be disposed of through any authorized TSDF operator located nearby following the manifest as per Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016. In case of a State/UT where TSDF is not available, all the CBWTF operators have to store incineration ash safely as per these guidelines.

d) Administrative Room

This room shall be utilized for general administration, record keeping, billing etc.

e) Generator set

CBWTF shall have a generator set of adequate capacity as standby arrangement for power, with sufficient capacity to run the treatment equipment during the failure of power supply. The generator set shall comply with the necessary requirement as per DG Set norms notified under the Environment (Protection) Act, 1986.

f) Continuous emission monitoring system (CEMS)

Monitoring provision for continuous monitoring of the incinerator/plasma pyrolysis stack emission shall be installed by the CBWTF operators for the parameters as stipulated by the respective SPCB/PCC as per the authorisation granted under the BMW Rules, 2016. Other-wise, at present, all the existing CBWTF operators are required to carry out stack emission monitored using continuous emission monitoring system for the flue gas parameters such as CO₂, O₂, CO as well as primary & secondary chamber temperatures, and records maintained. The continuous emission monitoring system for stack emission should be installed as per the guidelines issued by SPCB/PCC/CPCB. Also, the real time continuous stack emission

monitoring data is also required to be transmitted to the servers of the respective SPCB/PCC as well as CPCB, by all the existing CBWTF operators

g) Vehicle Parking

Provision for parking shall be made within the confines of the site for parking of required number of vehicles, loading and unloading of the vehicles meant for transporting waste to and from the facility, etc.. In case of a CBWTF with space constraints, multi-storey parking or a separate provision may be allowed only for parking of vehicles.

h) Display and sign board

An identification board (Display) of durable material and finish shall be displayed at the entrance to the facility. This shall clearly display the name of the facility, owner name, address and telephone number of the operator and the prescribed authority, no. of hours of operation & operational hours, telephone numbers of the personnel to be contacted in the event of an emergency, validity period of authorization as well as total daily waste treated and disposed. Also, sign boards should be provided at all the salient points (untreated waste storage area, treatment equipment, treated waste storage area, ETP, firefighting equipment) within the facility.

i) Washing Room

A washing room shall be provided for eye washing/hand washing/ bathing etc. for the workers.

j) Site Security

High walls, fencing and guarded gates shall be provided at the facility to prevent unauthorized access to the site by humans and livestock.

k) Fire safety

Fire safety equipment such as sand buckets and fire extinguishers should be provided at all the salient points of the CBWTF including at the diesel storage areas, diesel tanks connected with the incinerator etc. Fire alarm also should be provided within the CBWTF to prompt the workers in the event of any fire hazard. Workers should also be trained in First Aid administration.

l) First Aid Box

First Aid Box with necessary provisions need to be provided at all the salient points within the facility.

m) Green Belt

The open area available within the CBWTF shall be developed into green belt.

n) Website: (newly added as per BMWM Rules, 2016)

All the existing CBWTFs shall develop own website by 27.03.2017 whereas the upcoming CBWTF shall develop the website prior to the commencement of the facility. The website should be uploaded with relevant information periodically (on monthly basis) especially as detailed below:

- (i) A copy of the Environmental Clearance obtained;
- (ii) Copies of the Consents under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 as well as the Authorisation under the BMWM Rules obtained from the SPCB/PCC;
- (iii) 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;
- (iv) Charges levied on the member Health Care Facilities (HCFs) for treatment and disposal of bio-medical waste;
- (v) Vehicles connected with a provision of GPS as per BMWM Rules and Vehicle-wise route chart for collection, transportation of bio-medical waste from the member HCFs;
- (vi) Real time continuous online stack emission monitoring data;
- (vii) Daily bio-medical waste collected, received and treated (Member HCF-wise);
- (viii) 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;
- (ix) A copy of the annual report submitted to the respective SPCB/PCC;
- (x) Monitoring results of the stack emissions, treated wastewater and incineration ash, as per the frequency stipulated under the BMWM Rules;
- (xi) List of HCFs (located within the coverage area) with complete address which have not taken membership of the CBWTF for disposal of Bio-medical waste;
- (xii) Contact person, contact telephone number and e-mail addresses of the facility; and.

- (xiii) Provision to have access to the SPCB/PCC/CPCB/MoEF & CC/MoH & FW especially on GPS, online monitoring system and the data.

Besides the provisions suggested in the earlier paras, following important provisions should also be made in a CBWTF:

- (i) A telephone shall be provided and maintained at the facility.
- (ii) A First Aid Box shall be provided and maintained at the CBWTDF.
- (iii) Proper lighting shall be provided at the facility.
- (iv) Proper care shall be taken to keep the facility and surroundings free from odors.
- (v) Measures shall be implemented to control pests and insects at the site.
- (vi) Measures shall be implemented to control the escape of litter from the site.
- (vii) Necessary provision shall be made to prevent and control noise generated, if any, due to the activities at the site.
- (viii) Necessary protective gear for the waste handlers shall be provided.
- (ix) Immunization to all the workers of CBWTF against all the diseases including especially Tetanus and Hepatitis -B as stipulated under the BMW Rules.
- (x) Workers should have provisions such as washing, toilet, and suitable place for eating.
- (xi) Workers should also be provided with N-95 mask besides other PPEs such as hand gloves, gumboots, goggles etc.

Every CBWTF operator shall submit a work-plan to the Prescribed Authority. The work-plan should include the details of facilities at the CBWTF, collection, transportation & storage of the bio-medical wastes, operational details etc.

11) Record keeping

Maintenance of records for all operations carried out at the CBWTF is very important to monitor overall operation of the CBWTF. It also helps in submission of the required information to be submitted to the 'Prescribed Authority' by 30th June of every year as per the format prescribed under the BMW Rules or provided by the SPCB/PCC. A well-maintained record of all the activities at the CBWTF also enables the facility operator to produce all information of the activities on demand of the concerned prescribed authority. The record should include all information relating to each activity at the CBWTF site as per BMW Rules which include accidents occurred (spills, injury, fire accident) and the measures taken and also, however, minimum requirement is outlined below:

a) Records of waste movements

Daily records shall be maintained for the waste accepted and treated waste removed from the site. This record shall include the following minimum details:

- (i) **Waste accepted:** -Records on day-to-day basis (as per the format given at **Annexure-II**) shall be maintained with respect to the waste collection date, name of the healthcare unit with bar code, waste category as per BMWWM Rules, category-wise quantity of waste accepted, vehicle registration number used for collection of bio-medical waste from member health care facilities, time at which waste collected from member HCFs, name of the vehicle driver and his signature and waste receiving date & time (at CBWTF site). Similar information to be acknowledged to the member health care facility by the CBWTF operator on daily basis.
- (ii) **Treated waste to be disposed:-** Date, treated waste type, Quantity, vehicle number, disposal as stipulated under BMWWM Rules.

b) Logbook for the treatment equipment

A logbook shall be maintained for each treatment equipment installed at the site and shall include the following:

- (i) The weight of each batch.
- (ii) The categories of waste as per the Rules.
- (iii) The time, date and duration of each treatment cycle and total hours of operations.
- (iv) The complete details of all operational parameters during each cycle.

Log book to be maintained for operating the incinerator/plasma pyrolysis as well as the autoclave as per the formats given at **Annexure –III.**

c) Monitoring and reporting of operations in the CBWTF:

The monitoring of the key operating parameters of treatment equipment provides several benefits. First, monitoring provides the operator with information needed to make decisions on necessary combustion control adjustments. Second, properly maintained monitoring records can provide useful information for identifying operating trends and potential maintenance problems. Following are the suggested parameters for monitoring of the treatment equipment

(i) Monitoring of operating parameters of the incinerator/plasma pyrolysis:

Following operating parameters can be monitored in case of incinerator/plasma pyrolysis:

- Waste charge rate.
- Combustion gas temperature in primary and secondary chamber as well as the temperature of the stack exit gas (flue gas).
- Condition of the draft (negative draft in primary chamber).
- Combustion gas oxygen level in primary and secondary chamber as well as stack exit gas.
- Air flow rate through the incinerator/plasma pyrolysis.
- Carbon-Di-Oxide (CO₂), Oxygen (O₂) and Carbon Monoxide (CO) level in the flue gas.
- Quantity of auxiliary fuel usage as well as the power consumption (in every batch).
- Pressure drop in the primary chamber and APCD attached with the incinerator/plasma pyrolysis and
- Bottom ash or slag quality (for Total Organic Carbon (TOC) as well as loss on ignition and the hazardous constituents (at least once in a quarter).

(ii) Monitoring of operating parameters of the Autoclave: Following operating parameters can be monitored during the sterilization using autoclave:

- Time at which sterilization started and time at which sterilization completed.
- Temperature conditions maintained throughout the sterilization
- Conditions of pressure maintained throughout the sterilization
- Duration of sterilization
- Validation test results

Records concerning the above parameters need to be maintained and checked periodically for taking remedial measures during the operation of the incinerator or plasma pyrolysis or autoclave. In case of other treatment processes, the operational conditions as well as the efficacy tests to be complied with as per the standards prescribed under the BMW Rules.

(iii) Frequency of monitoring:

The CBWTF operator shall carry out following tests through a NABL approved laboratory or a laboratory approved under the Environment (Protection) Act, 1986, as

per the frequency stipulated under the BMWWM Rules or as prescribed by the SPCB/PCC and record of such analysis results shall be maintained and submitted to the prescribed authority (SPCB/PCC), as suggested below:

- **Liquid effluent:** Parameters such as pH, Suspended Solids, Oil & Grease, BOD, COD, Bio-assay for liquid effluent being discharged from the CBWTF be monitored as per the Consent conditions or once in a quarter and such records maintained and submitted to SPCB/PCC.

- **Stack emission monitoring:**

In case of the BMW incinerators which came after 28.03.2016, the Stack Emission shall be monitored (under optimum capacity) for parameters such as Particulate Matter, HCl, NO_x, Hg & compounds and combustion efficiency *once in three months* as required under schedule II of the Bio-medical Waste Management Rules 2016 (All monitored values shall be corrected to 11% Oxygen on dry basis). In case of dioxins and furans, monitoring should be done *once in a year* (monitored values shall be corrected to 11% Oxygen on dry basis). In case of the incinerators (existing prior to the notification of BMWWM Rules, 2016), new incinerators standards are required to be complied within two years i.e., by 27.03.2018.

- **Validation test of autoclave/microwave/chemical treatment/dry heat sterilization:**

Suggested validation test for treatment of bio-medical waste by autoclave/microwave/chemical treatment/Dry heat sterilization is given in **Table 1**.

Table 1: Suggested validation test for treatment of bio-medical waste by autoclave/microwave/chemical treatment/Dry heat sterilization

S. No	Type of equipment used for treatment of bio-medical waste	Type of Validation Test	Frequency
(i)	Autoclave	(i) biological indicator strips or vials <i>Geobacillus stearothermophilus</i> spores with at least 1×10^6 spores),	once in three months
		(ii) chemical indicator strip or tape	each batch of waste treated
(ii)	Microwave	<i>Bacillus atrophaeus</i> spores using vials or spore strips with at least 1×10^4 spores per detachable strip	Recommended: once in three months
(iii)	Chemical treatment followed by shredding	<i>Bacillus Subtilis</i> (ATCC 19659)- 4 Log ₁₀ reduction or greater	Once in a week
(iv)	Dry heat sterilisation	consistently kill the biological indicator <i>Geobacillus Stearothermophilus</i> or <i>Bacillus Atropheaus</i> spores using vials with at least 6 log ₁₀ spores per ml.	Once in three months
		A chemical indicator strip or tape	Once in a week

d) Site Records:

Site records shall include the following:

- (i) All the approvals obtained from other concerned departments other than the prescribed authority;
- (ii) Details of construction or engineering works;
- (iii) Maintenance schedule, breakdowns/trouble shootings and remedial actions;
- (iv) Emergencies;
- (v) Incidents of unacceptable waste received and the action taken; and
- (vi) Details of site inspections by the officials of the regulatory authorities, purpose of visits with date and necessary actions initiated on the observations.

Daily, monthly and annual summary records of all the above shall be maintained and made available at the site for inspection and same submitted whenever required by an authorized official of the concerned regulatory authorities.

12) Collection and transportation of bio-medical waste

The collection and transportation of bio-medical waste shall be carried out in a manner so as to prevent any possible hazard to human health and environment. Collection and transportation are the two operations where the chances of segregated bio-medical waste coming in contact with the public, rag pickers, animals/birds, etc. are high. Therefore, all care shall be taken to ensure that the segregated bio-medical waste handed over by the healthcare units reach CBWTF without any damage, spillage or unauthorized access by public, animals etc. A responsible person from the CBWTF operator shall always accompany the vehicle to supervise the collection and transportation of bio-medical waste. Also, the private transport vehicles should not be authorised by the SPCBs/PCCs only for transportation of the Bio-medical Waste. The CBWTF operator should be made responsible for collection and transportation of bio-medical waste.

a) Collection of bio-medical waste:

Generator of the bio-medical waste is responsible for providing segregated waste in accordance with the provisions of the Bio-medical Waste Management Rules, 2016, to the CBWTF operator. Dedicated temporary storage at healthcare unit shall be designated. The coloured bags handed over by the healthcare units shall be collected in similar coloured containers with proper cover. Each bag shall be labeled as per Schedule IV of the Bio-medical Waste Management Rules as well as with bar coding system (to be complied by the occupier or operator of a CBWTF as per BMWM Rules) so that at any time, the healthcare units can be traced back that are not segregating the bio-medical wastes as per BMWM Rules. The coloured containers should be strong enough to withstand any possible damage that may occur during loading, transportation or unloading of such containers. These containers shall also be labeled as per Schedule IV of the Rules. Sharps shall be collected in puncture resistant container. The person responsible for collection of bio-medical wastes shall also carry a register with him to maintain the records such as name of the healthcare unit, the type and quantity of waste received, time at which waste collected from the member HCF, signature of the authorised person from the healthcare unit etc. During transportation, the containers should be covered in order to prevent exposure of public to odours and contamination.

(b) Transportation of the collected bio-medical waste to the CBWTF:

All the vehicles used by the CBWTF operator shall not be sub-letted or contract vehicles should not be used by the CBWTF operator. All the vehicles owned by the CBWTF operator and intended only for collection of bio-medical waste from the member health care facilities should be registered under the Motor Vehicle Act with the respective RTO/Transport Department and such vehicle numbers should also be registered with the respective SPCB/PCC for the purpose of collection of bio-medical waste from the member health care facilities. The bio-medical waste collected in designated coloured containers shall be transported to the CBWTF in a fully covered vehicle. Such vehicle shall be dedicated for transportation of bio-medical waste only. Depending upon the volume of the wastes to be transported, the vehicle may be a two or three-wheeler, light motor vehicle or heavy duty vehicle. In either case, the vehicle must possess the following:

- (i) Transportation vehicle shall be fitted with GPS to track the movement of the vehicle.
 - (ii) Separate cabins shall be provided for driver/staff as well as for placing the designated colour coded bio-medical waste containers.
 - (iii) Two wheeler registered under the Motor Vehicle Act shall be permitted for collection of bio-medical waste only from the clinics or dispensaries located in places where the lanes are narrow and not easily accessible to four wheeler vehicles. Such two wheeler vehicle (s) should have a provision of a suitable fixed waste collection box marked with bio-hazard symbol, contact details, proper lid, emergency spill collection procedure, first aid box and manifest record in accordance with the BMWWM Rules
 - (iv) The base of the waste cabin shall be leak proof to avoid pilferage of liquid during transportation.
 - (v) The waste cabin may be designed for storing waste containers in tiers and also should be provided with a lighting provision.
 - (vi) The waste cabin shall be so designed that it is easy to wash and disinfect.
 - (vii) The inner surface of the waste cabin shall be made of smooth surface to minimize water retention.
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- (viii) The waste cabin shall have provisions for sufficient openings in the rear and/or sides so that waste containers can be easily loaded and unloaded.
- (ix) The vehicle shall be labeled with the bio-hazard symbol (as per Schedule IV of the BMW Rules) and should display the name, address and contact telephone and mobile number of the CBWTF.
- (x) The vehicle driver should carry always valid registration of the vehicle obtained from the concerned transport authority and also carry valid 'pollution under control certificate' issued by the authorized certificate issuing agency.

Depending upon the area to be covered under the CBWTF, the route of transportation shall be worked out. The transportation routes of the vehicle shall be designed for optimum travel distance and to cover all member healthcare units of the CBWTF. The CBWTF operator should ensure online and real time tracking & monitoring provisions (GPS provision) should be given access with passwords to the SPCB/PCC and CPCB to cross check the movement of the transportation vehicles on any time by the SPCB/PCC/CPCB. As far as possible, the transportation shall be carried out during non-peak traffic hours. If the area to be covered is very large, a satellite station may be established to store the bio-medical waste collected from the adjoining areas. The wastes so stored at satellite station may then be transported to the CBWTF in a big vehicle. It shall be ensured that the total time taken from generation of bio-medical waste to its treatment, which also includes collection and transportation time, shall not exceed 48 hours.

13) Disposal option of solid waste generated from the CBWTF

Treated plastic waste, incineration ash, treated waste sharps and glass waste, Oil & Grease waste and ETP sludge are generally generated from the CBWTF from the treatment systems such as autoclaving/microwaving, incineration, chemical disinfection and effluent treatment plant respectively. The treated bio-medical waste shall be disposed as per the options suggested in the **Table 2** given below:

Table 2: Suggested Disposal option of solid waste generated from the CBWTF

Sl. No.	Treated Waste Category	Suggested Treatment and Disposal Options
1.	Plastic wastes after disinfection and shredding	Plastic waste should not be sent to landfill sites. Treated plastic waste to be (i) sent to registered or authorized recyclers (or) (ii) for energy recovery (or) (iii) for diesel or fuel oil recovery (or) (iv) for road making, whichever is possible.
2.	Disinfected Sharps (including needles and syringes) (i.e., Treatment by Autoclaving or Dry Heat Sterilization followed by shredding or mutilation combination of shredding cum autoclaving)	Encapsulation in metal container or cements concrete; (or) sent for final disposal to iron foundries (having consent to operate from the SPCBs/PCCs (or) sanitary landfill or designated concrete waste sharp pit.
3.	Incineration ash	Incineration ash (ash from incineration of any bio-medical waste) shall be disposed through hazardous waste treatment, storage and disposal facility (TSDF), if toxic or hazardous constituents are present beyond the prescribed limits as given in Schedule –II of the Hazardous and Other Waste Management & Transboundary Movement Rules or as revised from time to time.
4.	Other treated solid wastes like Glass waste	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroplaning and then sent for recycling.
5.	Oil & Grease	By Incineration
6.	ETP Sludge	After drying in sludge drying beds or removal of moisture content using 'Filter Press' and such ETP sludge shall be given to CBWTF for incineration or to the hazardous waste treatment, storage and disposal facility (HWTSDf) for disposal in Secured Landfill
7.	Hazardous Waste	Disposal through a TSDF located nearby following the manifest as per the Hazardous and Other Waste (Management & Transboundary Movement) Rules, 2016

14) Cost to be charged by the CBWTF Operator for the Health Care Facilities

Cost to be charged from the healthcare facilities plays an important role in financial viability and sustainable operation of a CBWTF project, for providing the best treatment services to the Health Care Units and for ensuring compliance to the BMW Rules. The cost shall be so worked out that neither it becomes a monopoly of the CBWTF operator nor the interest of the CBWTF operator is overlooked. It is recommended that cost to be charged from the healthcare units, depending on the size, no. of beds and the distance from the location of the CBWTF and same shall be worked out in consultation with the concerned SPCB/PCC and the local Medical Association, keeping in view the following options:

- (a) In case of non-bedded health care units, fixed charges depending on the average quantity of waste generation per day, in case of the nursing homes/clinics/sample collection Centres /Dental Centres, dispensary, pathological laboratory, blood banks, and other non-bedded hospitals irrespective of their system of medicine including ayush hospitals.
- (b) In case of bedded hospitals, fixed charges per bed per day basis and based on the no. of beds for which consents under the Water Act, 1974/Air Act, 1981 and authorization granted under the BMW Rules, by the prescribed authority

Note:

- (i) Rates are required to be revised once in a year based on the Wholesale Price Index (WPI Index) or Consumer Price Index (CPI Index) (considering the prevailing market price especially in respect of the labour expenses, diesel prices, electricity, operating cost etc.,), by the State Advisory Committee in consultation with the concerned SPCB/PCC, local Medical Association and the representatives of the CBWTF Association
- (ii) The Health Care Facilities are required to ensure timely payments to the CBWTFs for ensuring timely treatment services in compliance to the BMW Rules as well as agreement made with the concerned CBWTF Operator.

15) Check list for development of CBWTF

The criteria for development of CBWTF have been discussed in detail in the

Previous sections. However, to have at a glance check in developing CBWTF, checklist is reproduced for convenience and is annexed **(Annexure-IV)**.

16) Periodic inspection/monitoring or performance evaluation of the CBWTF

To have uniformity in performance evaluation of the CBWTF throughout the country, a check list for performance evaluation of the CBWTF for carrying out inspection/monitoring/compliance verification has been prepared and is annexed **(Annexure –V)**. All the prescribed authority (SPCB/PCC) shall inspect the CBWTF at least once in six months located in the respective State/UT and a copy of the inspection reports shall be submitted to CPCB and MoEF & CC along with a copy of the action taken for ensuring compliance to the BMW Rules and CPCB guidelines issued from time to time and also such information is required to be uploaded in SPCB/PCC website. CPCB shall carryout random inspection of the CBWTFs once in a quarter and any violations observed further actions shall be initiated by CPCB if required under the Environment (Protection) Act, 1986.

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Annexure-I

Coverage area-wise gap analysis for assessing additional BMW treatment capacity requirement

S. No	Coverage area (pl. indicate areas covered by a CBWTF in the State/UT)	No. of HCFs		No. of Beds covered	Total estimated BMW generation in Kg/day	Total existing treatment capacity in Kg					Total BMW Treated and Disposed in Kg/day	Gap between total BMW Generation and the Existing BMW Treatment Capacity in Kg	Remarks (Whether additional Treatment Capacity is required or not)	
		Bedded	Non-bedded			Incineration	Autoclaving/ Hydroclaving /microwaving	Chemical disinfection	Deep burial	Any other mode of disposal			Yes	No
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)

Note: Above gap analysis coverage area-wise is required to be prepared once in five years and should be shown or depicted in a Map of State/UT.

Annexure- II**Format for maintaining the records by the CBWTF Operator alongwith the transportation Vehicle used for collection of bio-medical waste from the member HCFs**

Name of the CBWTF :
 Address of the CBWTF with contact details :
 Vehicle Registration Number (certificate to be carried by the vehicle driver) :
 Route covered (indicate places) by the vehicle :

Date	Vehicle number and the Time of arrival of the vehicle	Vehicle Speedo meter mileage readings in KM		Name of the HCF with address and the bar code number from whom waste collected	Category-wise quantity of bio-medical waste received in kg					Total BMW collected by the CBWTF		Name of the Vehicle driver with	Signatures	
		Initial	Final		Yellow	Red	Blue	Out dated medicines	White-Waste Sharps				Vehicle Driver	Representative of the HCF
										Total No. of Bags	Total waste			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)

Note: Above format is required to be maintained in duplicate both by the CBWTF Operator and the member HCF

Annexure - III

Log book for Operating the Incinerator/Plasma Pyrolysis

[illegible]

Note: Fill the details whichever is applicable

Log Book for Operating the Autoclave/Hydroclave

[illegible]

Annexure – IV

Check List for Development of a Common Bio-medical Waste Treatment and Disposal Facility & For issuing 'Consent to Establishment under Water & Air Acts

-
1. Name of the Proponent :
 2. Proposed location of the CBWTF :
 3. No. of HCFs in the locality :
 4. No. beds :
 5. Total Bio-medical Waste Generation in kg/day :
 - (i) Incinerable in kg/day :
 - (ii) Autoclavable in kg/day :
 - (iii) Glass waste in kg/day :
 - (iv) Waste sharps in kg/day :
 6. **Proposed location of the CBWTDF:** located away from
 - a) Residential area : Yes ☐ No ☐
 - b) Sensitive area : Yes ☐ No ☐
 - c) Industrial area : Yes ☐ No ☐
 - d) Is it as a part of TSDF : Yes ☐ No ☐
 - e) Is the facility proposed in Hilly areas : Yes ☐ No ☐
 - d) Buffer distance of 500 m available : Yes ☐ No ☐
 7. **Proposed land area for CBWTF:**
 - a) Area about 1 acre : Yes ☐ No ☐
 - b) Area less than 1 Acre : Yes ☐ No ☐
 - c) Area more than 1 Acre : Yes ☐ No ☐
 8. **Proposed coverage area of the CBWTF:**
 - a) Any facility located upto a radius of 75 KM from the proposed locality : Yes ☐ No ☐
 - b) No. of beds covered by the existing facility/proposed facility:
 - (i) more than 10, 000 beds : Yes ☐ No ☐
 - (ii) less than 10,000 beds : Yes ☐ No ☐
 - c) Is there any CBWTF within the radius of 75 KM : Yes ☐ No ☐
 - d) BMW Waste generation in a coverage area under consideration: Kg/day
-

- e) Existing CBWTF treatment Capacity :
 (a) Incineration/plasma pyrolysis : Kg/day
 (b) Autoclave/hydroclave : Kg/day
 f) Is locality requires any additional capacity (within a radius of 75 KMs)?.
 : Yes ☐ No ☐
 (i) If so, indicate reason:.....

9. Requirement of Treatment Facility: Following treatment facilities shall be provided in a CBWTF:

- a) Incineration : Yes ☐ No ☐
 b) Autoclave (Pre-vacuum horizontal feeding) / Hydroclave / Microwave.
 : Yes ☐ No ☐
 c) Shredder : Yes ☐ No ☐
 d) Sharp pit (with drawing details) : Yes ☐ No ☐
 e) Provision for floor washing/vehicle washing: Yes ☐ No ☐
 f) Effluent Treatment Plant : Yes ☐ No ☐
 g) Secured land fill/Disposal of ash in TSDF : Yes ☐ No ☐
 h) Other provisions as per CPCB guidelines : Yes ☐ No ☐

10. Segregation

- (i). Segregation shall be as per the Bio-medical Waste Management Rules, 2016 as amended as well as compatible with treatment facilities at CBWTF
 (ii). Occupier/Generator is responsible for providing segregated waste to the operator.

11. Collection

- (i) Respective coloured bags provided with bar code should be kept in similar coloured container i.e. coloured bags shall not be directly kept in vehicle.
 (ii) Sharps shall be collected in puncture resistant, leak proof, rigid containers.
 (iii) Temporary storage at healthcare unit shall be designated.

12. Transport Vehicle

- (I) Dedicated vehicles for collection of Bio-medical waste : Yes ☐ No ☐
 (II) Separate cabins shall be provided for driver/staff and the bio-medical waste containers : Yes ☐ No ☐

- (III) The base of the waste cabin shall be leak proof to avoid pilferage of liquid during transportation : Yes ☐ No ☐
- (I) The waste cabin may be designed for storing waste containers in tiers : Yes ☐ No ☐
- (V) The waste cabin shall be so designed that it is easy to wash and disinfect. : Yes ☐ No ☐
- (VI) The inner surface of the waste cabin shall be made of smooth surface to minimize water retention : Yes ☐ No ☐
- (VII) The waste cabin shall have provisions of sufficient openings in the rear and/or sides so that waste containers can be easily loaded and unloaded : Yes ☐ No ☐
- (VIII) The vehicle shall be labeled with the bio-hazard symbol (as per Schedule IV of BMW Rules) and should display the name, address and telephone number of the CBWTF : Yes ☐ No ☐
- (IX) Other provision as per CPCB guidelines : Yes ☐ No ☐

13. Storage

- (I) Sufficient ventilated storage space for untreated and treated bio-medical waste shall be provided. : Yes ☐ No ☐
- (II) The flooring and walls (to a height of 2M from floor) shall be finished with smooth and fine material. There shall be minimum number of joints. : Yes ☐ No ☐

14. Record Keeping

- (I) Documents such as collection advice taken from health care units for each category of waste, records of waste movements, logbook for the equipment and site records shall be maintained. : Yes ☐ No ☐
- (II) All the record (five year) shall be available at the CBWTF site for inspection. : Yes ☐ No ☐

15. Proposed Treated Waste Disposal method:

- (i). Incineration ash - Secured landfill/near by TSDF : Yes ☐ No ☐
- (ii). Plastic waste after disinfection and shredding –Registered Recycling Unit : Yes ☐ No ☐
- (iii). Sharps, after disinfection (if encapsulated) - Municipal landfill : Yes ☐ No ☐
- (iv). Treated wastewater –Discharge into sewer/drain or recycling in APCD

- (v). Oil & grease –By incineration: : Yes ☐ No ☐
- (VI). Any other mode of disposal of recyclable waste: : Yes ☐ No ☐
- (If so, pl. indicate)

16. Estimated energy consumption and fuel consumption per month :

- (i) Estimated energy consumption per month
- (a) General lighting in the facility :
- (b) Incinerator :
- (c) Autoclave/microwave :
- (d) Shredder :
- (e) ETP :
- (f) Any other :
- (ii) Estimated fuel consumption:
- (a) Diesel consumption :..... in Kl per month
- (b) No. of hours of operation of DG Set :
- (c) No. of hours of incineration :

17. Whether the proponent obtained necessary approvals from the concerned departments as required : Yes ☐ No ☐

(i) If yes, attach details

18. Whether the proponent obtained EC as per EIA 2006 and the amendments made thereof : Yes ☐ No ☐

(i) If yes, attach a copy of the EC obtained from the concerned

19. Whether the proposal recommended for issuing consent to establish

: Yes ☐ No ☐

(Signature of the official verified with date)

Annexure – V

**Check List for Performance Evaluation of the
Common Bio-medical Waste Treatment and Disposal Facility (CBWTF)**

S.No.	Details		Particulars
01.	Name of CBWTF with contact details	:	
02.	Date of visit	:	
03.	Location details of the CBWTF	:	a) Near to Residential area: :Yes ☐ No ☐ b) In/near Sensitive area: Yes ☐ No ☐ c) In Industrial area : Yes ☐ No ☐ d) Is there a buffer zone of 500 m: Yes ☐ No ☐ Indicate exact distance: in KM e) Is it as a part of TSDF: Yes ☐ No ☐ If so, distance of TSDF from the nearest CBWTF: KM.. f) Is the facility proposed in Metropolitan city: Yes ☐ No ☐ (i)Name of the City: (ii)Population of the City (as per latest census): g) Is the facility proposed in Hilly area : Yes ☐ No ☐ (i)Name of the Town/City:
04	Month / year of establishment and the Consents status	:	Establishment Month/Year :
05.	CBWTF set up by	:	
06.	CBWTF operated by	:	
07.	Total number of healthcare facilities and beds covered (as on date of visit)	:	No. of HCFs : No. of Beds : No. of HCFs and beds upto 75 KM radius:
08.	Total BMW Treatment Capacity of CBWTF (in kg / day)	:	Incineration : Autoclave : Any other treatment and disposal:

S.No.	Details	Particulars
09.	Consents and Authorization details :	
9.1	Consent under Water (Prevention and Control of Pollution) Act, 1974 :	☐ Applied for ☐ Not Applied for ☐ Possess Valid Consent ☐ Not renewed ☐ No consent If obtained: Consent is valid upto and issued by SPCB/PCC vide letter dated
9.2	Consent under Air (Prevention and Control of Pollution) Act, 1981 :	☐ Applied for ☐ Not Applied for ☐ Possess Valid Consent ☐ Not renewed ☐ No consent If obtained: Consent is valid upto and issued by SPCB/PCC vide letter dated
9.3	Environmental Clearance (EC)	☐ Applied for ☐ Not applied ☐ Obtained ☐ Not obtained If obtained: EC issued by SEIAA or MoEF& CC vide letter dated
9.4	Authorization under BMW Rules, 1998 :	☐ Applied for ☐ Not Applied for ☐ Possess Valid Authorisation ☐ Not renewed ☐ No Authorisation If obtained: Authorisation is valid upto and issued by SPCB/PCC vide letter dated
10.	Investment in setting up the CBWTF :	
11.	Area of plot size for CBWTF (Sq. ft.) :	
12	Annual Report submission for the year	Submitted before due date : :Yes ☐ No ☐ If yes, provide details of waste collected, received and treated & disposed of:
12.	Coverage area of CBWTF (radius in KM covered) :	Coverage area upto 75 km radius: Yes ☐ No ☐
13.	Name of Districts/Cities / places being covered :	(Pl. indicate Districts or places covered:.....) W.r.to the CBWTF (i) Farthest HCF located at :.. KM (ii) Nearest HCF located at :.....KM.

S.No.	Details		Particulars
14.	Daily operation schedule (timings)	:	(i) Collection: ...AM to PM. (ii) Incineration:....AM to PM (iii) Whether waste from member HCFs collected in holidays: ☐ Yes ☐ No
15.	Cost charged to the healthcare facilities	:	(i) Charges in Rs..... (ii) Is the cost to be levied suggested by: Organisation
16.	Total quantity of bio-medical waste treated: kg/day (avg.)		
16.1	Incinerable	:	 %
16.2	Autoclaving	:	%
16.3	Others (please specify waste type-wise)	:	%
17.	Staff involvement in CBWTF operation (number of persons):		
17.1	Managerial / Administration	:	
17.2	Equipment operations	:	
17.3	Transportation of BMW	:	No. of Drivers: No. of Helpers:
17.4	Sanitation and others	:	
17.5	Total persons excluding managers	:	
18.0	Collection and Transportation of bio-medical waste from member HCFs :		
18.1	No. of Vehicles used for collection of waste from member HCFs	:	(i) Four Wheelers: Nos and Vehicle Numbers: (ii) Two Wheelers :.....Nos and Vehicle Numbers:.....
18.2	Vehicles are labeled as per BMW Rules, 2016	:	☐ Satisfactory ☐ No satisfactory
18.3	Vehicles used are as per CPCB Guidelines	:	☐ Satisfactory ☐ No satisfactory
18.4	Vehicles attached with the GPS provision as per BMW Rules 2016	:	☐ Satisfactory ☐ No satisfactory
18.5	Whether waste collected from member HCFs adopted Bar coding system ?	:	☐ Yes ☐ No

S.No.	Details		Particulars												
19.0	Temporary untreated waste storage area	:	☐ Satisfactory ☐ No satisfactory												
20.0	Mode of conveyance of bio-medical waste from untreated waste storage area to the treatment equipment within the CBWTF	:	☐ Closed Trolley/Pull cart with bio-hazard symbol ☐ No Closed Trolley/Pull cart ☐ Others like												
21.0	Treatment equipment installed at CBWTDF														
21.1	Incinerator/plasma pyrolysis capacity and make	:	(i) No. of Incinerators including standby: (ii) Incineration capacity: kg /hr Kg/day.												
21.2	Daily Operation schedule of the incinerator /plasma pyrolysis (timings)	:	AM to PM (or) PM to AM Whether bio-medical waste collected from member HCFs is treated during holidays: Yes ☐ No ☐												
21.3	Consumption of auxiliary fuels	:	<table border="1"> <thead> <tr> <th>S. No</th><th>Type of Fuel</th><th>Consumption Quantity in liters per day</th><th>Bill numbers of purchase of fuel</th></tr> </thead> <tbody> <tr> <td>a)</td><td></td><td></td><td></td></tr> <tr> <td>b)</td><td></td><td></td><td></td></tr> </tbody> </table>	S. No	Type of Fuel	Consumption Quantity in liters per day	Bill numbers of purchase of fuel	a)				b)			
S. No	Type of Fuel	Consumption Quantity in liters per day	Bill numbers of purchase of fuel												
a)															
b)															
21.4	Stack attached with the incinerator /plasma pyrolysis	:	(i) Stack Diameter: m (ii) Stack Height : m above Ground Level												
21.5	Monitoring provision attached with the stack	:	☐ Platform ☐ Porthole ☐ access to the platform (Steps/Monkey Ladder/any other.....)												
21.6	Is stack monitoring provision satisfactory and as per CPCB guidelines	:	☐ Yes ☐ No												
21.7	air pollution control systems attached with the incinerator/plasma pyrolysis	:	(i) Quenching : ☐ Yes ☐ No (ii) Venturi scrubber : ☐ Yes ☐ No (iii) Droplet separator : ☐ Yes ☐ No (iv) Mist eliminator : ☐ Yes ☐ No (v) Filters : ☐ Yes ☐ No (vi) Lime and Activated Carbon injection: : ☐ Yes ☐ No												

S.No.	Details		Particulars
			(vii) ID Fan : ☐ Yes ☐ No (viii) Any other : (Pl. indicate)
21.8	Waste feeding mechanism	:	(i) Manual feeding : ☐ Yes ☐ No (ii) PLC based Automatic feeding : ☐ Yes ☐ No
21.9	Is PLC and automatic recording system (for recording operating parameters of the incinerator) attached with the incinerator/plasma pyrolysis	:	(i) PLC synchronized with waste feeding mechanism & in working condition: ☐ Yes ☐ No (I) PLC synchronized and recording system attached with incinerator and in working condition: ☐ Yes ☐ No
21.10	Operational conditions of the Incineration/plasma pyrolysis as observed during the visit	:	(i) Whether burners in working condition: ☐ Yes ☐ No (ii) Temperature maintained in Primary Chamber (range) : °C (iii) Temperature maintained in Secondary Chamber (range):..... °C (iv) Negative draft in Primacy Chamber : mm of water column (v) Pressure drop in the Venturi: mm of water column
21.11	Is continuous on-line monitoring system/Flue gas analyser attached with the incinerator/plasma pyrolysis for flue gas analysis (i.e CO, O ₂ and CO ₂)	:	(i) Is continuous online monitoring system (COMS) attached with incinerator: ☐ Yes ☐ No (ii) Observed values of flue gas parameters: CO ₂ :%; O ₂ : % and CO: % (iii) Observed Combustion Efficiency:% (iv) Observed values of stack emissions as per COMS
21.12	Emergency and Fire safety measures adopted within the facility is adequate	:	Is Emergency stack attached with the incinerator: ☐ Yes ☐ No Whether fire safety measures adopted (Fire Extinguishers, Sand buckets etc.): ☐ Yes ☐ No
21.13	Log book for incinerator/ plasma pyrolysis is maintained and satisfactory	:	Log Book Maintained: ☐ Yes ☐ No Log Book Maintained is satisfactory : ☐ Yes ☐ No

S.No.	Details		Particulars
21.14	Details of heat recovery system installed with incinerator/plasma pyrolysis	:	☐ Yes ☐ No
22.0	Capacity of autoclave and-- make	:	Autoclave of capacity kg/cycle and make installed.
22.1	Operating conditions of autoclave/microwave as observed during the visit	:	Operating parameters observed: (i) Temperature : in °C (ii) Pressure : in psi (iii) Residence time : in minutes
22.2	Provision made for the autoclave /microwave	:	Trolley for waste feeding : ☐ Yes ☐ No Graphic or computer recording device attached: ☐ Yes ☐ No
22.3	Spore test or strip test conducted regularly and records maintained	:	☐ Yes ☐ No Pl. indicate frequency of Strip test conducted: every batch /once in a week /quarterly /yearly Pl. indicate frequency of Spore test conducted: every batch /once in a week /quarterly /yearly
22.4	Performance of autoclave by spore testing or routine test	:	☐ Satisfactory ☐ Not satisfactory
22.5	Log book maintained for autoclave is satisfactory	:	Log Book Maintained: ☐ Yes ☐ No Log Book Maintained is satisfactory : ☐ Yes ☐ No
23.0	Capacity of shredder and make	:	 kg/hr. Self-designed & got fabricated locally.
24.0	Details of sharp pit / Encapsulation facility	:	(i) Sharp Pit provided : ☐ Yes ☐ No (ii) Is it as per CPCB guideline : ☐ Yes ☐ No (iii) Records maintained : ☐ Yes ☐ No (iv) Total quantity of waste sharps stored: (v) Total quantity of waste sharps treated and disposed:
25.0	Water Balance		
25.1	Source and quantity of water intake per day (cu.m / day)	:	Water consumption source: Water is drawn at KLD approximately. Is magnetic water flow meter attached to the water source/water storage tank : ☐ Yes ☐ No

S.No.	Details		Particulars														
			Magnetic water flow meter readings as per record (for last month): 1st Day of Month : _____ Last day of month : _____ Magnetic Flow meter as observed during the visit: <table border="1"> <thead> <tr> <th rowspan="2">S. No</th><th rowspan="2">Month</th><th colspan="2">Magnetic flow meter reading</th></tr> <tr> <th>Initial</th><th>Final</th></tr> </thead> <tbody> <tr> <td>(1)</td><td>Previous month</td><td></td><td></td></tr> <tr> <td>(2)</td><td>On the date of visit:.....</td><td></td><td></td></tr> </tbody> </table> If water requirement is met from outside through tankers, pl. provide No. of Tankers procured in a previous six months: _____ Total quantity of water consumed during the previous six months : in KLD	S. No	Month	Magnetic flow meter reading		Initial	Final	(1)	Previous month			(2)	On the date of visit:.....		
S. No	Month	Magnetic flow meter reading															
		Initial	Final														
(1)	Previous month																
(2)	On the date of visit:.....																
25.2	Break up of water usage (such as washing, scrubbing etc.)	:	Scrubber – KL/hr or KLD Washing – KLD Disinfections – KLD Gardening – KLD Domestic – KLD														
26.0	Total wastewater effluent generated per day	:	About KLD generated Quantity of treated water reused/recycled in %: _____ Any other mode of disposal: _____														
27.	Effluent treatment plant details																
27.1	ETP Capacity	:	 KL/Cycle														
27.2	Flow Chart of ETP	:	ETP comprising of: _____ Unit operations														
27.3	Intake and Discharge of ETP	:	(i) Magnetic Flow measuring device provided at the outlet of ETP: ☐ Yes ☐ No (ii) Energy meter attached to the ETP: ☐ Yes ☐ No (iii) Energy consumed over a period of one month: = ... Units (iv) pH meter attached at the outlet of ETP: ☐ Yes ☐ No														

S.No.	Details		Particulars
27.4	Final mode of disposal of treated water	:	(i) Is treated wastewater complying with the discharge norms ☐ Yes ☐ No (ii) Is Treated water is reused in the scrubber: ☐ Yes ☐ No (ii) Is Treated water is reused for gardening: ☐ Yes ☐ No (iii) Is Treated water is discharged in drain: ☐ Yes ☐ No (iv) Is Treated water is discharged in open area: ☐ Yes ☐ No
28.	Status of infrastructure provided (Pl. indicate 'Yes / No' whichever is applicable)		
28.1	Separate treatment equipment room	:	☐ Yes ☐ No
28.2	Main waste storage room	:	☐ Yes ☐ No
28.3	Treated waste storage room	:	☐ Yes ☐ No
28.4	Administrative room	:	☐ Yes ☐ No
28.5	Generator set	:	☐ Yes ☐ No
	(i) Capacity	:	
	(ii) Is Stack attached as per DG Set norms	:	☐ Yes ☐ No
	(iii) Is Acoustic enclosure provided as per DG Set norms	:	☐ Yes ☐ No
	(iv) Is DG Set complying to the emissions norms and noise level norms	:	☐ Yes ☐ No If so, pl. indicate latest monitoring results:
28.6	Site security (high walls, fencing, guarded gates etc.)	:	High walls on all four sides : ☐ Yes ☐ No Fencing on all the sides : ☐ Yes ☐ No Guarded Gates : ☐ Yes ☐ No Any other observation pl indicate:.....

S.No.	Details		Particulars
28.7	Parking facility	:	☐ Yes ☐ No
28.8	Sign board	:	☐ Yes ☐ No
28.9	Green belt	:	☐ Yes ☐ No
28.10	Washing room	:	☐ Yes ☐ No
28.11	First aid box	:	☐ Yes ☐ No
28.12	Lighting arrangements in the facility	:	☐ Yes ☐ No
28.13	Odour problem remedial measures	:	☐ Yes ☐ No
28.14	Fire fighting and emergency facilities	:	☐ Yes ☐ No
28.15	Measures for control of pests / insects etc.	:	☐ Yes ☐ No
28.16	Protective gear for waste handlers	:	☐ Yes ☐ No
28.17	Telephone facility	:	☐ Yes ☐ No
28.18	Provision of washing, toilets and safe place for eating for the workers		☐ Yes ☐ No
28.19	Fire alarm system provided in the facility		☐ Yes ☐ No
29.	Record maintenance and record keeping details (Pl. indicate 'Yes / No' whichever is applicable)		
29.1	Waste Movement /Manifest record	:	☐ Yes ☐ No
29.2	Log book for treatment equipment	:	☐ Yes ☐ No
29.3	Site records	:	☐ Yes ☐ No
29.4	Incineration ash generation and final disposal records	:	☐ Yes ☐ No
29.5	Treated plastic waste generation and its sale to the registered recycler	:	☐ Yes ☐ No
29.6	Syringes treated and its final disposal record	:	☐ Yes ☐ No

S.No.	Details		Particulars
29.7	Workers health status records		☐ Yes ☐ No
29.8	Workers immunization records		☐ Yes ☐ No
29.9	Medical and para-medical workers training records		☐ Yes ☐ No
29.10	Whether records maintained with regard to the accidents (such as fire, spills and injury and measures taken)		☐ Yes ☐ No
30.	Collection and transportation status (Yes / No)*		
30.1	Whether waste collected in a container of similar colour with label as per the Rules?	:	☐ Yes ☐ No
30.2	Whether the person who collects BMW maintain a register with him / her?	:	☐ Yes ☐ No
30.3	Has due attention have been given in vehicles to prevent spillage / pilferage/ loading / unloading etc.?	:	☐ Yes ☐ No
30.4	Is the vehicle labeled with the symbol and display the name, address, telephone number etc.?	:	☐ Yes ☐ No
30.5	Does the CBWTF operator use satellite station to store the waste?	:	☐ Yes ☐ No (If yes, give details.....)
30.6	The CBWTF operator collects waste daily or alternate day including	:	☐ Yes ☐ No

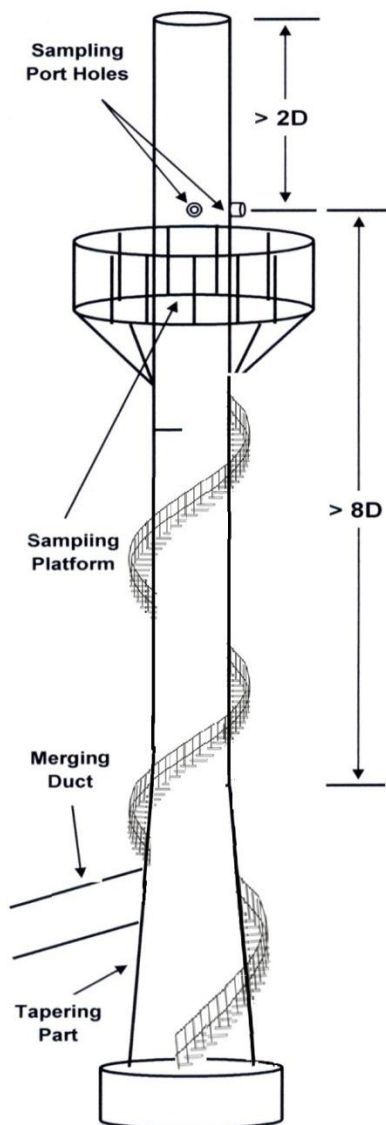
S.No.	Details		Particulars
	holidays?		
30.7	Whether waste treatment criterion of 48 hours is complied?		☐ Yes ☐ No
31.	Disposal of treated waste:		
31.1	Plastic waste after treatment	:	Plastic waste Sold to: M/s. and approved by SPCB/PCC
31.2	Treated sharps	:	Treated syringes disposal by:..... or through M/s.....and approved by SPCB/PCC
31.3	Incineration ash	:	Incineration ash disposal by: Disposal in Sanitary Landfill: ☐ Yes ☐ No Disposal through TSDF: ☐ Yes ☐ No Any other mode :.....
31.4	Other treated solid wastes	:	
31.5	Oil & grease	:	
31.6	Treated wastewater	:	
32.	Frequency of incinerator / autoclave / microwave / hydroclave / ETP discharge effluent testing and name of the laboratory (specify approved or not under E(P) Act, 1986 or NABL Accredited Lab.). Give details of compliance / non-compliance)	:	(i) Reported monitoring frequency: (ii) Stack monitoring : Quarterly : ☐ Yes ☐ No (iii) Waste water : Monthly/Quarterly/Yearly (iv) Incineration ash : Monthly/Quarterly/Yearly (v) Name of the Laboratory conducted test: (vi) Is the Laboratory approved under E (P) Act, 1986/.....SPCB/PCC/ NABL: : ☐ Yes ☐ No (vii) Copies of the analysis reports of treated effluent, incinerated ash, stack monitoring as (Annexures.....)
32.1	Frequency of site inspection by SPCBs/PCCs/CPCB/any other agencies	:	(i) No. of times in a year inspected by the SPCB/PCC: (ii) No. of times in a year inspected by the CPCB

S.No.	Details	Particulars																					
33.	Monitoring Results :																						
33.1	Incinerator stack emission (parameters stipulated in the Rules, temperature attainment in the chambers, residence time in the secondary chamber etc.)	<table border="1"> <thead> <tr> <th>Parameter</th> <th>PM</th> <th>HCl</th> <th>NOx</th> <th>Hg & compounds</th> <th>Dioxins and Furans</th> <th>C.E.</th> </tr> </thead> <tbody> <tr> <td>Date</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>LIMIT</td> <td>50</td> <td>50</td> <td>400</td> <td>0.05</td> <td>0.1 ng per Nm³ TEQ</td> <td>99.00%</td> </tr> </tbody> </table> Date of monitoring: Note: All values are in mg/Nm³, except CE	Parameter	PM	HCl	NOx	Hg & compounds	Dioxins and Furans	C.E.	Date							LIMIT	50	50	400	0.05	0.1 ng per Nm ³ TEQ	99.00%
Parameter	PM	HCl	NOx	Hg & compounds	Dioxins and Furans	C.E.																	
Date																							
LIMIT	50	50	400	0.05	0.1 ng per Nm ³ TEQ	99.00%																	
33.2	Whether Stack emission norms are complied with by the CBWTF	☐ Yes ☐ No																					
33.3	Incineration ash characteristics	Characteristics as per Schedule –II of HOW (M&TM) Rules,2016 (Annexure-----) Is it hazardous waste as per HOWM&TM Rules, 2016: ☐ Yes ☐ No																					
33.4	ETP inlet/outlet characteristics	All values are in mg/l except pH <table border="1"> <thead> <tr> <th>Parameter</th> <th>pH</th> <th>TSS</th> <th>COD</th> <th>BOD</th> <th>O&G</th> </tr> </thead> <tbody> <tr> <td>ETP Inlet Result</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ETP Outlet Result</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Parameter	pH	TSS	COD	BOD	O&G	ETP Inlet Result						ETP Outlet Result								
Parameter	pH	TSS	COD	BOD	O&G																		
ETP Inlet Result																							
ETP Outlet Result																							
33.5	Whether liquid effluent discharge norms are complying by the CBWTF	☐ Yes ☐ No																					
33.6	Whether CBWTF is submitting the annual report within the due date for the preceding year	☐ Yes ☐ No If Yes, annual report submitted vide letter No..... dated.....																					
34.	Any other relevant observations	(pl. enclose as annexure)																					
35.	Name of the officials with designation inspected /monitored the CBWTF and the signature																						

Annexure-VI

STATIONARY SOURCE EMISSION MONITORING

MODIFICATIONS TO BE MADE TO SAMPLING PLATFORM AND SAMPLING PORT HOLE



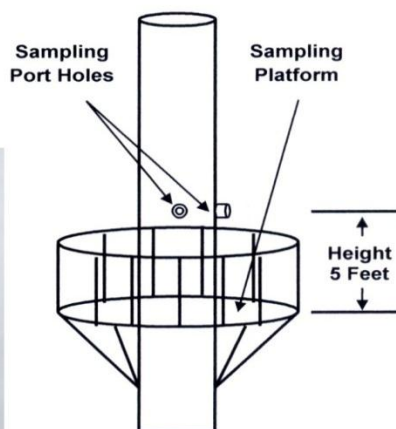
Number of Port Holes : Minimum two numbers of Port Holes at 90° apart from each other at a horizontal plane.

Location of Port Holes : Minimum 8 times of Internal Diameters of Stack downstream (upward direction of stack) from any duct confluence, bends and tapering & minimum 2 times of Internal Diameters of Stack upstream (downward direction of stack) from stack exit.

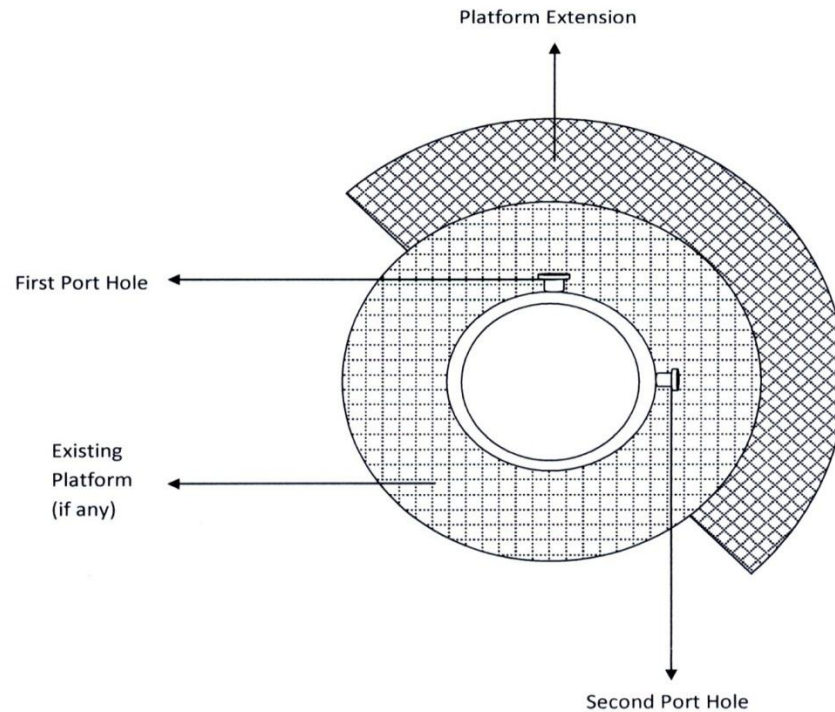
Location of Sampling Platform : 5 feet upstream (downward direction of stack) from the Port Hole as determined above.

Port Hole Flange : If the internal diameter of the flange is 4 inch or more then there is no need to change, if it is less than 4 inch then it has to be replaced with 4 inch flange. The flange should not protrude out more than 6 inches from the outer wall of the stack (it shall be kept as less as possible).

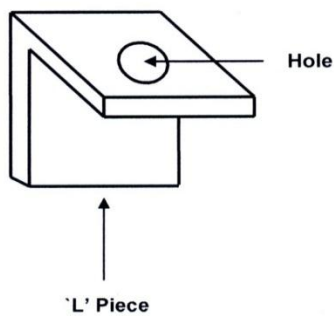
Sampling Platform Modification : A semi-circular extension of the existing platform (width extending outward by 6 feet from outside wall of the stack and covering at least one third of the circumference) may be provided for access to both the Port Holes. This area can be extended from the existing Platform and if deemed necessary for safety of the personnel a counter extension in opposite direction may also be provided. The extended Platform shall be strengthened with requisite support from the stack.



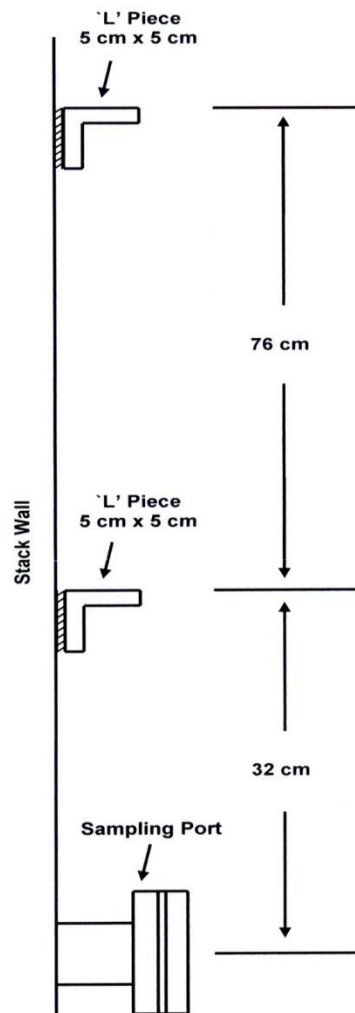
Note: Alternatively, safe access to monitoring platform may be provided with separate scaffolding-cum-staircase arrangement



Sampling Platform Modification / Extension



Fixing of 'L' Pieces on the stack wall : Two 'L' shaped pieces are to be fixed on the stack wall for mounting the Mono-Rail & Chain (part of the Sampling Kit for movement of sampling Train in & out through the Sampling Port Hole). The 'L' pieces shall be made of approximately 6 mm thick galvanized iron to have 5 cm long arms. One arm of the 'L' piece shall be welded on the stack wall and another arm shall have a hole of 14 mm diameter near the open end. Both the 'L' Pieces shall be welded on the stack wall at specified distances (as shown in the diagram on the next page) from the centre of Sampling Port Hole (in a vertical axis on the Stack Wall).



Fixing of 'L' Pieces on the Stack Wall

REFERENCES

1. Bio-medical Waste Management Rules, 2016.
2. CPCB Guidelines for CBWTFs (2003).
3. CPCB Guidelines for BMW Incinerators (2003).
4. 'Disposal of Bio-medical Waste generated during Universal Immunization Programme' issued by CPCB.
5. 'Guidelines for Environmentally Sound Management of Mercury Waste Generated from the Health Care Facilities' issued by CPCB.
6. Annual Report 2014 submitted to CPCB by the SPCBs/PCCs.
7. Stationary Source Emission Monitoring –Modifications to be made to the Sampling Platform and Sampling Port Hole issued by National Reference Trace Organics Laboratory (NRTOL), CPCB.

-- OO --

FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PLAN FOR ENVIRONMENTAL CLEARANCE

(Category "B" under Schedule 7(da) of EIA Notification dated 14.09.2006 and its Subsequent Amendments)

FOR

PROPOSED COMMON BIO-MEDICAL WASTE TREATMENT FACILITY

At Village –Kumraua, Block – Soron, Tehsil & District- Kasganj (Uttar Pradesh),

Total Area: - 4081 Sqm (0.408 Ha.),

Toposheet No. – 45I/9 & 53L/12

Category of Project - "B" Project schedule 7(da) - CBMWTF

Project Cost: 1.72/- Crores

Baseline Period – March 2021 to May 2021



2019-2020

HANDLE WITH CARE



CYTOTOXIC HAZARD SYMBOL



SUBMITTED TO

State Level Environment Impact Assessment Authority
Directorate of Environment, Vineet Khand-1, Gomti Nagar,
Lucknow – 226010, Uttar Pradesh

APPLICANT

M/s INDO TECH WASTE SOLUTION

Kheri Road, Shop No-2, Sector- 98,

Faridabad- 121002, Haryana.

E-mail:- kumarraman9999@gmail.com jraghav35@yahoo.com

ENVIRONMENT CONSULTANT



Sr. No.183



E- 101-102, Mewar Industrial Area, Madri,

Udaipur – 313003 (Rajasthan)

Phone No. 0294-2494600-2, Fax: 0294-2494608

E-mail – info.wcs@wolkem.com



TC- 5941

JULY 2022

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
Document No.	WIL/ITWS/EC-B/2019-2020/95

NABET ACCREDITATION CERTIFICATE



Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation



Wolkem India Limited, Udaipur

E – 101 to 102, Mewar Industrial Area, Madri, Udaipur 313 003

*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	Thermal power plants	4	1 (d)	B
3	Mineral beneficiation	7	2 (b)	A
4	Pesticides industry and pesticide specific intermediates (excluding formulations)	17	5 (b)	A
5	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
6	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (d)	A
7	Bio-medical waste treatment facilities	32A	7 (d a)	B
8	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Aug 20, 2021 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/21/2119 dated Oct 26, 2021. The accreditation needs to be renewed before the expiry date by Wolkem India Limited, Udaipur following due process of assessment.


Sr. Director, NABET
Dated: Oct 26, 2021

Certificate No.
NABET/EIA/2124/RA 0216

Valid up to
Feb 05, 2024

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
Document No.	WIL/ITWS/EC-B/2019-2020/95

UNDERTAKING LETTER BY PROJECT PROPONENT

Mob: 6287097232

INDO TECH WASTE SOLUTION

Khasra No. - 1161, Village - Kumraua, Block - Saron
Tehsil & Dist. - Kasganj, Uttar Pradesh
Office Address - Kheri Road, Shop No. - 2. Sector - 98, Faridabad, Haryana - 121002
email :- kumarraman9999@gmail.com

Ref. No : Date: 04/07/2022..

To, Date:
Member Secretary
State Level Environment Impact Assessment Authority, Uttar Pradesh
Directorate of Environment, Vineet Khand-1,
Gomti Nagar, Lucknow.
Pin- 226010.

Subject –Undertaking letter for owing of EIA & EMP Report for Proposed Common Bio-medical Waste Treatment Facility at Village- Kumraua, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh by M/s Indo Tech Waste Solution, Total Area:- 4081 s.qm. (0.408 Ha.)

Respected Sir,

With reference to above mention subject, we hereby give our undertaking for owing the content (information and Data) of EIA report for proposed “Common Bio-medical Waste Treatment Facility at Village- Kumraua, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh”.

We request you to kindly process our application and issue the Environment Clearance at the earliest.

Thank you

Yours Sincerely,


Raman Kumar
M/s Indo Tech Waste Solution
Faridabad, Haryana

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
Document No.	WIL/ITWS/EC-B/2019-2020/95

UNDERTAKING LETTER BY ENVIRONMENTAL CONSULTANT



Laboratory : E- 102, Mewar Industrial Area, Madri, Udaipur - 313003, Rajasthan (INDIA)

Phone : 91 294 2494600 to 02 E-mail : info.wcs@wolkem.com



www.wolkem.com

UNDERTAKING BY ENVIRONMENT CONSULTANT

I **Vikrant Mahendran**, Wolkem India Limited (Consultancy Division) is accredited by QCI/NABET having certification number **NABET/EIA/2124/RA 0216 VALID UPTO 05.02.2024**. WIL laboratory is well equipped quality lab having sophisticated equipment's. It is accredited by NABL Certificate No. TC-5941, Issue date 26/12/2019, Validity- 25.12.2022).

1. That I am the Environmental consultant for the final EIA/EMP report of M/s Indo Tech Waste Solution, Proposed Common Bio-medical Waste Treatment Facility at Khasra No- 1161 at Village-Kumroua, Block- Soron, Tehsil & District- Kasganj Uttar Pradesh, Sector- 32(A), MoEF&CC-7 (da) Common Bio-medical Waste Treatment Facility (CBMWTF), Category -B1.
2. The total plot area of the project is 4081 Sqm (0.4081 Ha.).
3. There is no litigation pending against the project and/or land in which the project is proposed to set up Common Bio-medical waste treatment facility and that for any such litigation whatsoever, the sole responsibility will be borne by the project proponent.
4. That the details regarding violations of EIA Notification the data presented are factually correct also owning the content of the EIA & EMP report, as per MoEF&CC Circular dated 14.03.2017 & 08.03.2018.
5. The above contents of undertaking are true and correct, and nothing has been concealed thereof.

For Wolkem India Limited,


Vikrant Mahendran
 Chief Manager (Environment)

Registered & Corporate Office :
 "Wolkem House", E-101, Mewar Industrial Area, Madri, Udaipur - 313003, Rajasthan-India
 Phone : +91 294 2494600 - 02 E-mail : info@wolkem.com
 CIN- U29299RJ1971PLC001379



Our Commitment.. Your Trust

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. –Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
Document No.	WIL/ITWS/EC-B/2019-2020/95

LIST OF ABBREVIATIONS

AAQ	Ambient Air Quality
AMSL	Above Mean Sea Level
bgl	Below Ground Level
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
CBMWTF	Common Bio-medical Waste Treatment Facilities
CER	Corporate Environment Responsibility
CPCB	Central Pollution Control Board
dB	Decibel
DO	Dissolved Oxygen
EIA	Environmental Impact Assessment
ETP	Effluent Treatment Plant
EMC	Environmental Management Cell
EMP	Environment Management Plan
EPA	The Environment Protection Act
GLC	Ground Level Concentration
GOI	Government Of India
GIS	Geographic Information System
Ha	Hectare
HMV	Heavy Motor Vehicle
HFL	High Flood Level
IMD	Indian Meteorological Department
IS	Indian Standards
KLD	Kilo litre Per Day
Km	Kilo Meter
Leq	Equivalent Noise Level
MoEF&CC	Ministry of Environment, Forest and Climate Change
O&M	Operation and Maintenance
NABET	National Accreditation Board for Education and Training
NH	National Highway
NOC	No Objection Certificate
OSHA	Occupational Safety and Health Administration
PCU	Passenger Car Unit
PFR	Pre- feasibility Report
PF/RF	Protected Forest/Reserve Forest
PM_{10/2.5}	Particulate Matter
PP	Project Proponent
PPE	Personal Protective Equipment
QCI	Quality Council of India
RL	Reduced Level
R & R Plan	Resettlement & Rehabilitation plan
SEAC	State Level Environment Assessment Committee
SEIAA	State Environmental Impact Assessment Authority
SH	State Highway

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
Document No.	WIL/ITWS/EC-B/2019-2020/95

STP	Sewage Treatment Plant
SPCB	State Pollution Control Board
ToR	Terms of Reference
UPPCB	Uttar Pradesh Pollution Control Board
USEPA	United State Environmental Protection Agency
N	North
E	East
W	West
S	South

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. –Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
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I	Letter of Terms of Reference (ToR) By SEIAA, Uttar Pradesh
II	Land Lease Agreement
III	NOC From Gram Panchayat
IV	UPPCB Report For Number of Beds In Districts
V	Application For Landuse of Project Land
VI	MSME Certificate
VII	CMO NOC
VIII	Request Letter To UPPCB for NOC
IX	Laboratory Analysis Reports Of Baseline Studies
X	Affidavit alongwith Baseline Monitoring photographs
XI	Layout Map of Proposed Project
XII	PH Proceedings
XIII	MoU between Project Proponent and Consultant
XIV	Nearby Existing CBWTF Map

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
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Environment Impact Assessment & Environment Management Plan

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
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ToR LETTER

State Level Environment Impact Assessment Authority, Uttar Pradesh

Directorate of Environment, U.P.

Vineet Khand-1, Gomti Nagar, Lucknow - 226 010

Phone : 91-522-2300 541, Fax : 91-522-2300 543

E-mail : doeuplko@yahoo.com

Website : www.seiaaup.com

To,

M/s Indo Tech Waste Solution,
Kheri Road, Shop no- 2, Sector-98,
Faridabad, Haryana- 121002

Ref. No. 92/Parya/SEIAA/6191/2021

Date: 11 June, 2021

Sub: Terms of Reference for Proposed Common Biomedical Waste Management Facility at Khasra No.- 1161, Village- Kumraua, Block- Saron, Tehsil & District- Kasganj, U.P., M/s Indo Tech Waste Solution.

Dear Sir,

Please refer to your application/letter dated 12-02-2021 & 24-02-2021 addressed to the Secretary, SEAC, Directorate of Environment, U.P., Lucknow on the subject as above. The matter was considered by the State Level Expert Appraisal Committee in its meeting held on dated 09-03-2021 and SEIAA in its meeting dated 21-05-2021.

A presentation was made by project proponent along with their consultant M/s Wolkem India Limited. The proponent, through the documents submitted and the presentation made informed the committee that:-

1. The environmental clearance is sought for Common Biomedical Waste Management Facility at Khasra No.- 1161, Village- Kumraua, Block- Saron, Tehsil & District- Kasganj, U.P., M/s Indo Tech Waste Solution.
2. Salient features of the project:

Project Activity	7(da) -- Bio-Medical Waste Treatment Facilities
Category	Category B
Key Details of the Project	
Project Capacity (Proposed)	Proposed Project Capacity-10,000 beds Current BMW Waste Generation- 10,000 beds The proposed project will cover 75 km or more if required as per authority requirements.
New/Expansion/Modernization	New
Land Area	4081 Sqm (0.408 ha)
Land Ownership	Lease land for 15 years by Mr. Raman Kumar of M/s Indo Tech Waste Solution.
Water Requirement & Source	5 KLD, Source- Bore Well (CGWB Application would be applied)
Project Cost	Rs- 172/- Lakhs (1.72/- Crore)
Nearest Water Bodies/Rivers	
Power Requirement & Source	62 KW, Source- Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL). DG set (62.5 KVA) is proposed for power backup.
Employment	
Full Time Employees	42
Contract Employees	The labours and workers will be hired from near by villages.
Location Details	
Location	Kumraua Village, Block- Saron District- Kasganj, Uttar Pradesh
Khasra No.	Khasra No.- 1161
Coordinates	
SOI Topo Map No.	45I/9, 53L/12, 54I/5 & 53L/8
Nearest Railway Station	Kasganj Railway Station (16.10 km in S)
Nearest Airport	Agra (Pandit Deen Dayal Upadhyay) Airport (110 km in SW)
Nearest Town/Habitation	Pachlana 1 Km in NNE
Seismic Zone	Seismic Zone- IV

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
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Tor for Proposed Common Biomedical Waste Management Facility at Khasra No.-1161, Village- Kumraua, Block- Saron, Tehsil & District- Kasganj, U.P., M/s Indo Tech Waste Solution.

3. Land use details:

S.No.	Components/Particular	Area in SQ.M.	Percentage
1	Build up Area (Autoclave, Shredder etc..)	831.00	20.36
2	Incinerator Area	334.00	8.18
3	E.T.P Area	25.00	0.61
4	Road Area	1055.00	25.85
5	Green Belt	1347.00	33.00
6	Open Area	489.00	11.98
Total Area		4081.00	100

4. Green Area details:

Total Green belt (33%)	1347 Sq. mt
No of Rows	Three Rows
Plantation Type	Trees- APTI-ITRA
Total No. Trees Proposed	1300No.
Shrubs	400 No.
Odour management Species	ITRA Plantation technique (Z shape)
Indigenous Tree & root Aroma Plantation © IECRS	

5. Equipment details:

S.No	Equipment	Installed Capacity	Number
1	Static Dry Incinerator	200 Kg/hrs	1
2	Horizontal Cylindrical Autoclave	2500 ltr/hr or 250Kg/batch	1
3	Shredder	150 kg/hrs	1
4	Effluent Treatment Plant	5 KLD	1

6. Total water requirement of the project during construction phase is 02 KLD and operation phase is 05 KLD which shall be sourced from nearby areas.

7. The amount of total waste water generated out of proposed CBWTF is 2 KLD which shall be treated in 5 KLD ETP. It will be a Zero Liquid Discharge Unit.

8. The project proposal falls under category-7(da) of EIA Notification, 2006 (as amended).

The committee/Authority discussed the matter and recommended/granted following additional terms of reference's (AToR's) for conducting EIA regarding the project:

(A) Additional TOR:

- All pages of technical documents/EIA/EMP etc. should be signed by the consultant and project proponent both.
- Copy of all the analysis reports duly signed by analyst approved by NABL or MoEF&CC shall be annexed with the EIA report and original analysis reports should be presented at the time of presentation.
- MOU signed between the project proponent and the consultant should be submitted.
- The project proponent shall obtain the forest clearance and permission of Central and State Government as per law under the provisions of Forest (conservation) Act, 1980 and submit along with EIA.
- Public hearing shall be conducted as per EIA notification, 2006 (as amended).
- SEIAA opined that the project proponent shall submit permission of CGWA or proposal for alternative source of fresh water.
- Letters from CMO, Kasganj regarding feasibility/requirement of Common Biomedical Waste Treatment Facility at the proposed site at the time of EIA.
- Common biomedical waste inventory should be provided.
- The EIA report should address regarding the disposal of covid-19 waste as per the latest guidelines.
- PP/Consultant should provide the details of other bio medical waste facility within 75 Km radius of the proposed site.
- 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.

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Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
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Tor for Proposed Common Biomedical Waste Management Facility at Khasra No.-1161, Village- Kumraua, Block- Saron, Tehsil & District- Kasganj, U.P., M/s Indo Tech Waste Solution.

12. Submit the details of the road/rail connectivity along with the likely impacts and mitigative measures.
13. Submit the present land use and permission required for any conversion such as forest, agriculture etc.
14. Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources, justification, etc. In addition, it should provide EMP.
15. Land requirement for the facility including its break up for various purposes, its availability and optimization.
16. Details of proposed layout clearly demarcating various activities such as security. Waste Storage Rooms, Waste Treatment Equipment Rooms/Areas, Treated Waste Storage Room, Pollution Control Devices like APCS and ETP, ash storage/disposal area, vehicle washing areas, and others such as admin area, worker's room, health centers, greenbelt, etc.
17. Details on collection and transportation of Bio Medical Waste from health care establishments, No. of vehicles and feature of vehicles, etc.
18. Details of the treatment equipment's capacity and make. Details of the incineration system – a statement on the compliance to the CPCB guidelines for common bio medical waste incinerators in respect of waste feed cutoffs, operating parameters of combustion chambers, flue gas cleaning, ash handling, etc. Details on fuel requirement for incineration. Details on flue gas emissions discharge through stack and proposed pollution control technologies. Details on residue/ash generation and management. Details of waste heat utilization, if any. Details on wastewater management alongwith zero discharge plans as committed by the project proponent.
19. Details of the proposed overall safety and health protection measures and submit specific programme.
20. Details on source of water and power supply.
21. Details of the existing access road(s)/walkways to the designed operations in the site and its layout.
22. Location of the incineration facility and nearest habitats with distances from the facility to be demarcated on a toposheet (1: 50000 scale).
23. Land use map based on satellite imagery including location specific sensitivities such as national parks / wildlife sanctuary, villages, industries, etc.
24. Topography details.
25. Surface water quality of nearby water bodies.
26. Details on proposed groundwater monitoring wells, locations, frequency of monitoring, parameters, etc.
27. Corporate Environmental Responsibility (CER) shall be prepared by the project proponent and the details of the various heads of expenditure to be submitted as per the guidelines provided in the recent CER notification No. 22-65/2017-IA.III dated 01/05/2018. A copy of resolution as above shall be submitted to the authority alongwith list of beneficiaries with their mobile nos./address.
28. Action plan for the greenbelt development in accordance to CPCB published guidelines.
29. Details on pollution control technologies and online monitoring equipments.
30. Details on monitoring of pollutants at source –performance of the incinerator. Including operating hours, fuel consumption, operating parameters (Combustion chamber – temperature, pressure, Stack temperature, total particulate matter, HCl, NOx as per Bio Medial Waste (Management & Handling) Rules 1998.
31. Stack and fugitive emissions may be monitored for SPM, SO₂ & NOx as per Bio Medical Waste (Management & Handling) Rules 2016.
32. Details of Administrative and technical organizational structure.
33. EMP devised to mitigate the adverse impacts of the project should be provided along with item-wise cost of its implementation (Capital and recurring costs).
34. Details of the emergency preparedness plan and on-site & off-site disaster management plan.
35. Affidavit to be submitted for the actual surveys done with detailed photographs of monitoring etc.
36. NOC from UPPCB shall be taken and submitted to SEAC before submission of EIA report.
37. Examine the details of transportation of Hazardous wastes, and its safety in handling.
38. Examine and submit the details of on line pollutant monitoring.
39. Examine the details of monitoring of Dioxin and Furon.
40. MoU for disposal of ash through the TSDF.

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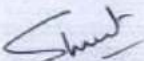
Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
Document No.	WIL/ITWS/EC-B/2019-2020/95

Tor for Proposed Common Biomedical Waste Management Facility at Khasra No.-1161, Village- Kumraua, Block- Saron, Tehsil & District- Kasganj, U.P., M/s Indo Tech Waste Solution,

41. MoU for disposal of scrubbing waste water through CETP.
42. Examine and submit details of monitoring of water quality around the landfill site.
43. Examine and submit details of the odour control measures.
44. Examine and submit details of impact on water body and mitigative measures during rainy season.
45. 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.
46. Water quality around the landfill site shall be monitored regularly to examine the impact on the ground water.
47. The storage and handling of hazardous wastes shall be as per the Hazardous Waste Management Rules.
48. Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.
49. 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.
50. A detailed draft EIA/EMP report should be prepared in accordance with the above additional TOR and should be submitted to the Ministry in accordance with the Notification.
51. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
52. 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 final EIA report after incorporation of public hearing observations/comments should be submitted to the committee for further consideration of the matter.

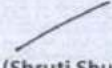
This is to request you to take further necessary action in matter as per provisions of Gazette Notification No. S.O. 1533(E) dated 14/09/2006, as amended. You are advised to submit the EIA/EMP for further consideration of the matter as per procedure laid down in the Gazette Notification SO 1533(E) dated 14/09/2006 as amended. The matter will not be considered pending till your reply as above is received.


(Shruti Shukla)
Nodal, SEIAA/
Deputy Director

No...../Parya/SEAC/6191/2018 Dated: As above

Copy with enclosure for Information and necessary action to:

1. The Principal Secretary, Department of Environment, Govt. of Uttar Pradesh, Lucknow.
2. Advisor, IA Division, Ministry of Environment, Forests & Climate Change, Govt. of India, Indira Paryavaran Bhawan, Jor Bagh Road, Aliganj, New Delhi.
3. Additional Director, Regional Office, Ministry of Environment & Forests, (Central Region), Kendriya Bhawan, 5th Floor, Sector-H, Aliganj, Lucknow.
4. District Magistrate, Kasganj.
5. The Member Secretary, U.P. Pollution Control Board, TC-12V, Paryavaran Bhawan, Vibhuti Khand, Gomti Nagar, Lucknow.
6. Copy to Web Master/ guard file.


(Shruti Shukla)
Nodal, SEIAA/
Deputy Director

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Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
Applicant	M/s Indo Tech Waste Solution
Document No.	WIL/ITWS/EC-B/2019-2020/95

ToR COMPLIANCE

(ToR vide letter no. 93/Parya/SEIAA/6191/2021 dated 11th June 2021)

Standard Terms of Reference		
S.No.	Terms of Reference	Compliance
1	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	The proposed project site at Kasganj District is meeting site selection criteria of MoEF&CC/CPCB/CPHEEO guidelines as well as the stringent site selection criteria of TSDF,s and proves to be the suitable location considering both the environmental and economic factors. One alternative site was examined for Common Bio-medical Waste Treatment Facility at Village - Vishanpur, Tehsil- Iglas, Aligarh, Uttar Pradesh. This Aligarh site was falling under 75 km radius of existing CBMWTF Mathura. Hence, the Aligarh site is not meeting siting criteria as per BMW Rules 2016. Detailed Site selection criteria for the proposed project as per MoEF&CC/CPCB/CPHEEO guidelines & TSDF are furnished in Table No- 5.1 of Chapter no. 5.
2	Submit the details of the road/rail connectivity along with the likely impacts and mitigative measures	The proposed site is well connected by all means of transport. • Nearest connecting Road is Major District Road - MDR 82W (0.07km in W). • Kasganj Railway Station is located at a distance of 16.10 km S. It has been proposed that all the vehicles shall be covered to ensure zero spillage and the waste cabins shall be leak proof, having proper labels as per BMW rules 2016. All measures shall be put in place to ensure no exposure of public to contamination /odour. The waste transportation vehicles shall be maintained in full compliance with Bio- Medical Waste Management Rules, 2016 and its subsequent amendments, Motor Act 1988 and CPCB/SPCB guidelines. Therefore, the impacts due to the proposed facility are anticipated to be minimal.
3	Submit the present land use and permission required for any conversion such as forest, agriculture etc	The proposed land is taken on Lease for 15 years by Mr. Raman Kumar of M/s Indo Tech Waste Solution. Land Lease Agreement is enclosed as annexure – II. NOC from the Gram Panchayat (Kumroua village) was obtained on 14.01.2021 for the proposed project. NOC letter is attached as annexure – IV.

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		Also, M/s Indo Tech Waste Solution has applied for conversion for land use via Revenue Council Uttar Pradesh online portal case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amendment 2016) section 80 (1) on dated; 11.10.2021 for the purpose of establishment of the proposed common bio-medical waste treatment facility. Application letter is enclosed as annexure – V.
4	Examine the details of transportation of Hazardous wastes, and its safety in handling	The hazardous waste generated in CBWTF like Incineration ash and ETP sludge shall be disposed through authorized TSDF operator located nearby following the manifest as per Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 or as revised from time to time.
5	Examine and submit details of monitoring of water quality around the landfill site. Water analysis shall also include for nitrate and phosphate.	No landfill site is proposed within the CBWTF. Ash from Incineration and ETP Sludge from Effluent Treatment Plant shall be disposed off at TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi (VIII), Akbarpur, Dist.- Kanpur Dehat, - 209101. Ground water Quality for 8 locations were analysed with following results: • The pH varying from 6.96 to 7.28 and all samples were falling within the acceptable limit. • The TDS varying from 216 to 703 mg/l, six samples were falling within acceptable limit and two samples are falling above acceptable limit but within permissible limit. • The Chloride levels were ranging from 16 to 74 mg/l. All samples are falling within acceptable limit. • The hardness is varying from 144 to 388 mg/l and three samples were observed above the acceptable limit and five samples are falling above the acceptable limit but within permissible limits. 3 locations were analysed for Surface water Quality with following results: • The pH was varying between 7.11 to 7.29. The pH values for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS: 2296-1992. • The total dissolved solids were in the range of 122 to 156 mg/l. The TDS for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS: 2296-1992.

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		- The chlorides were in the range of 11 to 14 mg/l, indicating that all samples were meeting the Class 'A' norms as per IS: 2296-1992. - The total hardness is varying between 80 to 98 mg/l. n which all samples are meeting the Class 'A' norms as per IS: 2296-1992. - DO for the all the surface water samples varies between 7.0 to 7.8 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992. - BOD for the all the surface water samples varies between 1.9 to 2.5 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992. - Hence, the above analysis result of surface waterquality is indicating & meets the Class 'B' norms as per IS: 2296-1992. The quality of ground and surface water scenario details are given in table no. 3.11 & 3.12 of Chapter-3.
6	Examine and submit the details of on line pollutant monitoring	Dry Static Incinerator with fitted fully automatic Air Pollution Control Device has been proposed for the project to ensure compliance of emission standards as per BMW rules 2016. Parameters to be monitored online include NO_x, SO₂, PM, HCl and the real time data shall be transmitted to the servers at CPCB/UPPCB (if required by PCB). All necessary air pollution control devices shall be put in place to meet CPCB/UPPCB guidelines & BMW rules 2016.
7	Examine the details of monitoring of Dioxin and Furon	The following masures will be taken to prevent formation of Dioxin & Furon and to ensure the compliance of emission standards as per CPCB/UPPCB guidelines & BMW rules 2016 and its subsequent amendments. - The proposed facility will utilizes non-chlorinated plastic colored bags with BIS standards only. - Wastes to be incinerated shall not be chemically treated with any chlorinated disinfectants. - The temperature of the primary chamber shall be a minimum of 800C and the secondary chamber shall be minimum of 1050C + or - 50C with atleast 2 sec gas retension time in secondary chamber. - The Monitoring of dioxins and furans shall be done once in a year through a professional authorized third party.
8	MoU for disposal of ash through	M/s Indo Tech Waste Solution intend to send all the

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	the TSDF	incineration ash to TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi (VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101. M/s Indo Tech Waste Solution will enter into a formal agreement for disposal of ash soon after obtaining regulatory approvals (EC/CTE etc.).
9	MoU for disposal of scrubbing waste water through CETP	The wastewater generated from boiler blow down & floor & vehicles washing activities in proposed Facility which shall be collected in a sump. Collected waste water shall be treated in In-house in proposed Effluent Treatment Plant (ETP) of 5 KLD capacities and treated water shall be used for greenbelt development and washing purpose within the plant premises. No treated wastewater shall be let out of the premises to maintain zero liquid discharge facility. Hence, MoU with CETP is not required. Details of wastewater generation, treatment and reuse of treated water are well furnished in section no. 4.4.2, Table no. 4.3 of Chapter-4.
10	Examine and submit details of monitoring of water quality around the landfill site.	No landfill site is proposed within the CBWTF. Ash from Incineration and Sludge from Effluent Treatment Plant shall be disposed off at TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi (VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101 for which M/s Indo Tech Waste Solution will enter into a formal agreement. The quality of ground and surface water scenario details are given in table no. 3.11 & 3.12 of Chapter-3.
11	Examine and submit details of the odour control measures.	The following measures are proposed for odour control and proper operation /mainitance of proposed CBWTF site as per CPCB/UPPCB guidelines & BMW rules 2016 and its subsequent amendments are:- • Odor concentration by spraying Herbal Inocouloums or Ecosorb (organic and biodegradable chemical) around odor generation areas at regular intervals. • Plantation of Indigenous Tree & Root Aroma to reduce the odor and to carry out the process in closed room for controlling/minimizing odor. • It shall be ensured that the bio-medical waste should be treated within 48hrs of its generation. • During transportation, the containers shall be

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		covered in order to prevent exposure of public to odour and contamination. Daily washing of waste collecting containers, vehicle compartment and floor of store room. Details are presented in Chapter 9
12	Examine and submit details of impact on water body and mitigative measures during rainy season	The Proposed CBMWTF is Zero Liquid Discharge facility; Hence, there will not be any impact on water bodies. Generated Wastewater in the facility shall be treated in In-house Effluent Treatment Plant to meet the parameters as per CPCB/UPPCB standards and BMW rules 2016. The treated water shall be used for greenbelt development and washing purpose within the plant premises. Details are given in Chapter-4
13	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	Detailed EMP has been proposed for the project including proposed monitoring plans with EMP budget (Including Capital Cost and Annual Recurring Cost). M/s Indo Tech Waste Solution has proposed environmental management cell to ensure the implementation of EMP, interaction with the environmental regulatory agencies, reviewing draft policy and planning. Details of proposed EMP are well presented in Chapter-9. The proposed capital cost for the project is INR 1.72 Crores and total investment on environmental improvement i.e EMP works is envisaged Rs. 46.4 lakhs/- and recurring expenditure during the stage of operation is Rs. 16.4 lakhs/- as recurring investment is earmarks for EMP. As per the directions given in the MoEF&CC Office Memorandum, F.No. 22-65/2017-IA-III on 30th September 2020, all the proposed activities will be part of Environmental Management Plan (EMP) instead of CER. Addition to above the project proponent has proposed to invest amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project. . The mitigation measures proposed to minimize and control odor (addition to measures give in compliances of ToR no. 11 above) are as follows.

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		• Plantation of trees to reduce the odor. • Good housekeeping practices. • It shall be ensured that the total time taken from generation of bio-medical waste to its treatment, which also includes collection and transportation time, shall not exceed 48 hours. • Dilution of odorant by odor counteraction or neutralize by spraying Ecosorb (organic and biodegradable chemical). • Covering the landfill area with layer of earth, clay or a similar material on daily basis. Regular monitoring of all environmental attributes during construction & operational phases is proposed for the project. Detailed Environmental Monitoring Plan is well furnished in Table no. 6.1 & 6.2 of Chapter – 6.
14	Water quality around the landfill site shall be monitored regularly to examine the impact on the ground water.	No landfill is proposed for the facility. 8 no. of ground water samples and 3 no. of surface water samples were collected and analysed in core & buffer zone of the proposed site within 10 km Radius of study area. All samples were analyzed for physical and chemical characteristics and were found within the permissible & acceptable limits in all ground water samples and surface water quality is indicating & meets the Class 'B' norms as per IS: 2296-1992. The detailed quality analysis with results of ground and surface water are well furnished in table no. 3.11 & 3.12 of Chapter-3.
15	The storage and handling of hazardous wastes shall be as per the Hazardous Waste Management Rules	The hazardous waste generated from the proposed facility will be ash from incinerator and sludge ETP which will be collected and stored in separate designated area for HW and then will be sent to HW authorized vendor i.e. TSDF Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi (VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101 for its final disposal. And for which M/s Indo Tech Waste Solution will enter into a formal agreement. The Proposed Facility shall follow Hazardous & Other Waste (Management & Transboundary Movement) Rules 2016 and its amendments thereafter for storage & handling the HW.
16	Submit details of a	On-site and Off-site Disaster Management Plan (DMP) and

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	comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster	Emergency preparedness plan during natural and man-made disaster are well furnished in section 7.2 of Chapter-7. The proposed plan also includes fire & safety hazard planning and occupational health planning for the project.																				
17	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 Ministry and not on the basis of Minutes of the Meeting available on the website.	Public Hearing for the proposed project was conducted on 06.06.2022 (12:30 PM) at “Collectorate Office, Kasganj, Uttar Pradesh in accordance with the EIA notification 2006 & SPCB and its proceedings are incorporated in Final EIA/EMP report. The Public Hearing was organised by Uttar Pradesh Pollution Control Board and Presided by District Magistrate, Kasganj, Uttar Pradesh.																				
18	A detailed draft EIA/EMP report should be prepared in accordance with the above additional TOR and should be submitted to the Ministry in accordance with the Notification.	Followed & Complied.																				
19	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	There is no litigation is pending against the proposed project. Hence not applicable.																				
20	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Total project capital cost is proposed INR 1.72/- Crores. The proposed cost for the implementation EMP for the project is around INR 46.4/- lakhs as capital cost and INR 16.4 lakhs as recurring cost. Detailed breakup for implementing EMP budget for the project is mention in Chapter no 6 and below:- EMP Budget <table><tr><th>S. No.</th><th>Particulars</th><th>Capital Cost (Rs) lakhs</th><th>Recurring Cost (Rs) lakhs/annum</th></tr><tr><td>1</td><td>Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc</td><td>20</td><td>5</td></tr><tr><td>2</td><td>Odor and Noise Control Measures</td><td>5</td><td>2</td></tr><tr><td>3</td><td>Landscaping and Greenbelt Development</td><td>5</td><td>2</td></tr><tr><td>4</td><td>Storm Water Drains &</td><td>2</td><td>2.5</td></tr></table>	S. No.	Particulars	Capital Cost (Rs) lakhs	Recurring Cost (Rs) lakhs/annum	1	Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc	20	5	2	Odor and Noise Control Measures	5	2	3	Landscaping and Greenbelt Development	5	2	4	Storm Water Drains &	2	2.5
S. No.	Particulars	Capital Cost (Rs) lakhs	Recurring Cost (Rs) lakhs/annum																			
1	Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc	20	5																			
2	Odor and Noise Control Measures	5	2																			
3	Landscaping and Greenbelt Development	5	2																			
4	Storm Water Drains &	2	2.5																			

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			Storage Tanks		
		5	Ambient Air Monitoring & Online Stack Monitoring	10	0.5
		6	Ash Disposal	1	4
		7	Health Care (Performing free Cataract surgeries, Infrastructure support to area Govt. Hospitals like providing bed and equipment for treatment etc.) COVID financial assistance	0.85	0.10
		8	Promoting Education (providing infrastructure like construction of additional class rooms, furniture, smart class facilities, support to special children education /therapy etc. in nearby village)	0.85	0.10
		9	Environment care (taking up avenue plantation, Plantation in communities, providing solar power/ lights, rain water harvesting etc.)	0.85	0.10
		10	Rural Development (laying roads, construction of drains, community halls, other infrastructure for development of surrounding villages)	0.85	0.10
		Total		46.4	16.4
		As per the directions given in the MoEF&CC Office Memorandum, F.No. 22-65/2017-IA-III on 30 th September 2020, all the proposed activities will be part of Environmental Management Plan (EMP) instead of CER.			
		Addition to above the project proponent has proposed to invest amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project.			
21	Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website	All the studies/activities suggested in the ToR were completed in detail and presented in the EIA/EMP report. No further clarification required for carrying out the studies suggested.			

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	http://moef.nic.in/Manual/Incinerator	
Additional Terms of Reference		
1.	All pages of technical documents/EIA/EMP etc. should be signed by the consultant and project proponent both.	Followed & Complied.
2.	Copy of all the analysis reports duly signed by analyst approved by NABL or MoEF&CC shall be annexed with the EIA Report and original analysis reports should be presented at the time of presentation.	Complied. Copy of Analysis Reports of baseline studies carried in March to May, 2021 are enclosed as Annexure – IX of EIA-EMP report.
3.	MOU signed between the project proponent and the consultant should be submitted	Complied. Copy of MoU for the consultancy services (EIA study for obtaining EC) has been enclosed as annexure- XII
4.	The project proponent shall obtain the forest clearance and permission of central and state government as per law under the provisions of Forest (conservation) Act, 1980 and submit along with EIA	Not Applicable. No Forest Land is Involve in proposed facility. As a proof, copy of toposheet is given in figure no-2.3 chapter -2.
5.	Public Hearing shall be conducted as per EIA notification, 2006 (as amended)	Public Hearing for the proposed project was conducted on 06.06.2022 (12:30 PM) at “Collectorate Office, Kasganj, Uttar Pradesh in accordance with the EIA notification 2006 & SPCB and its proceedings are incorporated in Final EIA/EMP report. The Public Hearing is organised by Uttar Pradesh Pollution Control Board and Presided by District Magistrate, Kasganj, Uttar Pradesh.
6.	SEIAA opined that the project proponent shall submit permission of CGWA or proposal for alternative source of fresh water	Water for construction phase will be obtained through tanker supplies. During Operational Phase water will be sourced from External Water Tankers and Bore Well NOC for CGWA was submitted on 12.07.2022 as per CGWA guidelines issued dated: 24.09.2020.
7.	Letters from CMO, Kasganj regarding feasibility/requirement of Common Biomedical Waste Treatment Facility at the proposed site at	Letter from CMO, Kasganj regarding feasibility/requirement of Common Biomedical Waste Treatment Facility obtained by M/s. Indo Tech Waste Solution dated 27.12.2021 is enclosed as annexure - VII

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	the time of EIA.	
8.	Common biomedical waste inventory should be provided	Based on the inventory as per UP Pollution Control Board report submitted to the Oversight Committee, NGT, U.P., Lucknow, vide order dated- 20.07.2020, before the Hon'ble NGT in the O.A. 710 of 2017 (Shailesh Singh vs Sheela Hospital & Trauma Centre, Shahjahanpur & Ors.) connected with O.A.'s 711, 712 & 713 of 2017. All three plants (Mathura, Agra & Shajahanpur) adjoining/surrounding/nearby the proposed plant are operation/covering more than 10,000 beds (against the prescribed limit under the Rules) in the coverage area. In fact, the total number of beds covered by these units together is 53,286 which are far beyond the permissible capacity of 30,000 (i.e. 10,000 each). Copy of report is attached as annexure – IV. Hence, M/s. Indo Tech Waste Solution has proposed for the setting up a Common Bio-Medical Waste Treatment Facility At Village –Kumraua, Block- Soron, Tehsi & District- Kasganj, Uttar Pradesh.
9.	The EIA report should address regarding the disposal of covid-19 waste as per the latest Guidelines.	All the waste from isolated areas designated for treatment of COVID 19 patients will be collected separately in separate designated bins and will be treated as per Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of COVID-19 Patient dated 26th April 2022 and Subsequent Amendments. Details regarding the COVID-19 treatment & disposal are well explained in table no. 1.2 and section 2.10.7 of chapter 1 & 2.
10.	PP/Consultant should provide the details of other bio medical waste facility within 75 Km radius of the proposed site.	There are no other biomedical waste treatment facilities within 75 km radius of the proposed site. As per the guideline of CPCB, one CBWTF facility will cover 75 km area and 10000 beds. Nearby CBMWTF are Mathura, Agra, Shajahanpur and Mainpuri each Facility is at distance 92KM, 92KM, and 89KM respectively from project site. Details of nearest bio medical waste facility of the proposed site is given in table no. 1.4 of Chapter-1.
11.	Reasons for selecting the site with details of alternate sites examined/rejected/selected on merit with comparative	One alternative site was examined for setting up Common Bio-medical Waste Treatment Facility at Village - Vishanpur, Tehsil- Iglas, Aligarh, Uttar Pradesh. The alternative Aligarh site was coming under 75 km radius

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	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.	of existing Mathura CBMWTF as per BMW Rules 2016. The proposed project site is meeting site selection criteria of MoEF&CC/CPCB/CPHEEO guidelines as well as the stringent site selection criteria of TSDF,s. Site selection criteria for the proposed project as per MoEF&CC/CPCB/CPHEEO guidelines are given in Table No- 5.1 of Chapter – 5.
12.	Submit the details of the road/rail connectivity along with the likely impacts and mitigative Measures	The proposed site is well connected by all means of transport. Nearest Road is MDR 82W (0.07km in W). Kasganj Railway Station is located at a distance of 16.10 km at south direction. Impacts due to the proposed facility are expected to be minimal. However, there is no Highway (national & state) within 10 km radius of study area. The waste transportation vehicles shall be maintained in full compliance with Bio- Medical Waste Management Rules, 2016 and its subsequent amendments. The vehicles shall be covered to ensure zero spillage and the waste cabins shall be leak proof. All measures shall be put in place to ensure no exposure of public to contamination /odour.
13.	Submit the present land use and permission required for any conversion such as forest, agriculture etc.	The proposed land is taken on Lease for 15 years by Mr. Raman Kumar of M/s Indo Tech Waste Solution. Land Lease Agreement is enclosed as annexure – II. NOC from the Gram Panchayat (Kumroua village) was obtained on 14.01.2021 for the proposed project. NOC letter is attached as annexure – IV. Also, M/s Indo Tech Waste Solution has applied for conversion for land use via Revenue Council Uttar Pradesh online portal case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amendment 2016) section 80 (1) on dated; 11.10.2021 for the purpose of establishment of the proposed common bio-medical waste treatment facility. Application letter is enclosed as annexure – V.
14.	Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources,	Noted & Complied. Executive Summary of the proposed project is including in the EIA-EMP Report.

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	justification, etc. In addition, it should provide EMP.																																	
15.	Land requirement for the facility including its break up for various purposes, its availability and optimization	The proposed facility will be set up at 0.408 Hectare (4081 Sq. m.) land. Land use break up and proposed layout plan is given in table no. 2.2 of Chapter-2. Land Use Breakup <table><tr><th>S.No</th><th>Particulars</th><th>Area in Sqm</th><th>Area in %</th></tr><tr><td>1</td><td>Build Up Area</td><td>831</td><td>20.37</td></tr><tr><td>2</td><td>Incinerator Area</td><td>334</td><td>8.18</td></tr><tr><td>3</td><td>E.T.P Area</td><td>25</td><td>0.62</td></tr><tr><td>4</td><td>Road Area</td><td>1055</td><td>25.85</td></tr><tr><td>5</td><td>Green Belt</td><td>1347</td><td>33</td></tr><tr><td>5</td><td>Open Area</td><td>489</td><td>11.98</td></tr><tr><td></td><td>Total Area</td><td>4081</td><td>100.00</td></tr></table>	S.No	Particulars	Area in Sqm	Area in %	1	Build Up Area	831	20.37	2	Incinerator Area	334	8.18	3	E.T.P Area	25	0.62	4	Road Area	1055	25.85	5	Green Belt	1347	33	5	Open Area	489	11.98		Total Area	4081	100.00
S.No	Particulars	Area in Sqm	Area in %																															
1	Build Up Area	831	20.37																															
2	Incinerator Area	334	8.18																															
3	E.T.P Area	25	0.62																															
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5	Green Belt	1347	33																															
5	Open Area	489	11.98																															
	Total Area	4081	100.00																															
16.	Details of proposed layout clearly demarcating various activities such as security. Waste Storage Rooms, Waste Treatment Equipment Rooms/ Areas, Treated Waste Storage Room, Pollution Control Devices like APCS and ETP, ash storage/disposal area, vehicle washing areas, and others such as admin area, worker's room, health centers, greenbelt, etc.	The detailed layout of the project including security. Waste Storage Rooms, Waste Treatment Equipment Rooms/ Areas, Treated Waste Storage Room, Pollution Control Devices like APCS and ETP, ash storage/disposal area, vehicle washing areas, and others such as admin area, worker's room, health centers, greenbelt, etc is shown in table no. 2.4 of Chapter no. 2.																																
17.	Details on collection and transportation of Bio Medical Waste from health care establishments, No. of vehicles and feature of vehicles, etc	A fleet of 10 dedicated vehicles with GPS tracking system designed as per the specification and guidelines of CPCB/ UPPCB will be used for collection & transportation of biomedical waste from health care facility within 75 km of coverage area. Haulage route map covering all the health facilities with 75 coverage area is shown in figure no. 2.13. The waste transportation vehicles shall be maintained in full compliance with Bio- Medical Waste Management Rules, 2016 and its subsequent amendments. The vehicles shall be covered to ensure zero spillage and the waste cabins shall be leak proof. All measures shall be put in place to ensure no exposure of public to contamination /odour.																																
18.	Details of the treatment equipment's capacity and make.	The proposed treatment facilities are given below- Autoclaving- 250 kg/batch																																

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	Details of the incineration system – a statement on the compliance to the CPCB guidelines for common bio medical waste incinerators in respect of waste feed cutoffs, operating parameters of combustion chambers, flue gas cleaning, ash handling, etc. Details on fuel requirement for incineration. Details on flue gas emissions discharge through stack and proposed pollution control technologies. Details on residue/ash generation and management. Details of waste heat utilization, if any. Details on wastewater management alongwith zero discharge plans as committed by the project proponent	Shredding- 150 Kg/hrs Incineration- 200 Kg/hrs Proposed Static Dry Incinerator is Dry Technology with fully automation and fitted with Advanced Air Pollution Control Device. Process Description as per CPCB Guidelines/BMW Rules 2016 and its Amendment, • Dual chambered incinerator–Fixed Hearth Incinerator (Static Type)- 200 Kg/Hrs • Primary chamber operating temp - 800°C±50°C & Secondary operating at 1050°C±50°C. • Residence Time of Flue gases prior exit from Sec. Chamber- 2+ seconds • Refractory & insulation bricks - IS: 8-1994 & IS: 2042-2006 respectively. • Total Organic Carbon (TOC) – In slag and bottom ashes <3% or Loss on Ignition (LoI)< 5% dry weight. • Height of Stack -30 Mtr with sampling port holes • Exit Flue gases temp- <220°C • Incinerator shall be continuously monitored data • Dry scrubbing Unit for flue gas prior release to environment. • 80 liter/hour of diesel Demand of Fuel • Combustion efficiency (CE) shall be at least 99.00% • Zero discharge thorough incineration process Ash from Incineration and Sludge from Effluent Treatment Plant shall be disposed off at TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi(VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101. The wastewater generated from Proposed Facility shall be collected in a sump. Collected waste water shall be treated in In-house Effluent Treatment Plant (ETP) and the treated water shall be reused primarily in APCDs. No treated wastewater shall be let out of the premises of the CBWTF.
19.	Details of the proposed overall safety and health protection measures and submit specific Programme	Occupational health planning has been proposed for overall safety and health protection for the workers which includes providing PPE's, regular health check up, First aid facilities etc. Details of occupational health are well furnished in section 7.3.2 to 7.3.5 of Chapter – 7.
20.	Details on source of water and	The total water requirement during construction phase

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	power supply.	will be approx. 2 KLD and during operational phase will be approx.. 5 KLD. Source- Bore Well & External Water Tankers. Total Power requirement 62 KW will be supply from Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL) cater to the needs of the BMW facility. Sufficient capacity DG set (62.5 KVA) is proposed for power backup.
21.	Details of the existing access road(s)/walkways to the designed operations in the site and its layout.	The proposed site is well connected by all means of transport. Nearest Road is MDR 82W (0.07km in W direction with respect to proposed project site). The proposed project layout is shown in 2.4 of Chapter 2.
22.	Location of the incineration facility and nearest habitats with distances from the facility to be demarcated on a toposheet (1: 50000 scale).	The proposed project layout plan showing proposed incinerator at site and toposheet map (1:50000 scale) with details nearest habitats is shown in 2.4 and 2.3 of Chapter 2 respectively.
23.	Land use map based on satellite imagery including location specific sensitivities such as national parks / wildlife sanctuary, villages, industries, etc.	Land use map based on satellite imagery including location specific sensitivities such as national parks / wildlife sanctuary, villages, industries, etc. is shown in figure no. 3.10 and 3.11 with statistics in table 3.27 in section no. 3.8 of Chapter-3.
24.	Topography details	Details on Topography and Geography of study area are well furnished in section 7.4 of Chapter-7.
25.	Surface water quality of nearby water bodies	To asses the surface water quality total 3 no. of samples were collected around the proposed site within 10 km Radius. All samples were analyzed for physical and chemical characteristics and were found that surface water quality is indicating & meets the Class 'B' norms as per IS: 2296-1992. The detailed quality analysis with results of ground and surface water are well furnished in table no. 3.11 & 3.12 of Chapter-3.
26.	Details on proposed groundwater monitoring wells, locations, frequency of monitoring, parameters, etc.	It has proposed that the frequency of the monitoring and reporting will be six monthly bases as per local state PCB and regional MoEF&CC. Also proposed that Comprehensive monitoring will be as per IS 10500 for reporting Groundwater level in BGL for which one peisometric/monitoring well within the site is proposed.
27.	Corporate Environmental Responsibility (CER) shall be prepared by the project	As per the directions given in the MoEF&CC Office Memorandum, F.No. 22-65/2017-IA-III on 30th September 2020, all the proposed activities will be part

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	proponent and the details of the various heads of expenditure to be submitted as per the guidelines provided in the recent CER notification No. 22-65/2017-IA.III dated 01/05/2018. A copy of resolution as above shall be submitted to the authority alongwith list of beneficiaries with their mobile nos./address.	of Environmental Management Plan (EMP) instead of CER. The proposed capital cost for the project is INR 1.72 Crores and total investment on environmental improvement i.e EMP works is envisaged Rs. 46.4 lakhs/- and recurring expenditure during the stage of operation is Rs. 16.4 lakhs/- as recurring investment is earmarks for EMP. Addition to above the project proponent has proposed to invest amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project. . Detailed breakup for implementing EMP budget for the project is mention in Chapter no 6.																																																																												
28.	Action plan for the greenbelt development in accordance to CPCB published guidelines	Detailed Action Plan for the greenbelt development accordance to CPCB published guidelines is given in section 10.3.6 of Chapter- 10 The following species are proposed for plantation <table><tr><th>S.No</th><th>Botanical Name</th><th>Family</th><th>Common Name</th></tr><tr><td>1</td><td><i>Acacia nilotica</i></td><td>Fabaceae</td><td>Babul</td></tr><tr><td>2</td><td><i>Albizia saman</i></td><td>Mimosaceae</td><td>Coco tamarind</td></tr><tr><td>3</td><td><i>Artocarpus heterophyllus</i></td><td>Urticaceae</td><td>Jack Fruit</td></tr><tr><td>4</td><td><i>Azadirachta indica</i></td><td>Meliaceae</td><td>Neem</td></tr><tr><td>5</td><td><i>Cassia fistula</i></td><td>Caesalpiniaceae</td><td>Golden shower tree</td></tr><tr><td>6</td><td><i>Cocos nucifera</i></td><td>Arecaceae</td><td>Coconut</td></tr><tr><td>7</td><td><i>Delonix regia</i></td><td>Caesalpinaceae</td><td>Gulmohar Tree</td></tr><tr><td>8</td><td><i>Dendrocalamus Strictus</i></td><td>Poaceae</td><td>Bamboo</td></tr><tr><td>9</td><td><i>Emblica officinalis</i></td><td>Euphorbiaceae</td><td>Amla</td></tr><tr><td>10</td><td><i>Ficus religiosa</i></td><td>Moraceae</td><td>Peepul tree</td></tr><tr><td>11</td><td><i>Hibiscus rosa sinensis</i></td><td>Malvaceae</td><td>Marigold</td></tr><tr><td>12</td><td><i>Mangifera indica</i></td><td>Anacardiaceae</td><td>Mango Tree</td></tr><tr><td>13</td><td><i>Millingtonia hortensis</i></td><td>Bignoniaceae</td><td>Indian Cork Tree</td></tr><tr><td>14</td><td><i>Nerium oleander</i></td><td>Apocynaceae</td><td>Oleander</td></tr><tr><td>15</td><td><i>Polythia longifolia</i></td><td>Anonaceae</td><td>Ashok</td></tr><tr><td>16</td><td><i>Psidium guajava</i></td><td>Myrtaceae</td><td>Guava</td></tr><tr><td>17</td><td><i>Syzygium cumini</i></td><td>Myrtaceae</td><td>Java plum</td></tr><tr><td>18</td><td><i>Tamarindus</i></td><td>Fabaceae</td><td>Tamarind Tree</td></tr></table>	S.No	Botanical Name	Family	Common Name	1	<i>Acacia nilotica</i>	Fabaceae	Babul	2	<i>Albizia saman</i>	Mimosaceae	Coco tamarind	3	<i>Artocarpus heterophyllus</i>	Urticaceae	Jack Fruit	4	<i>Azadirachta indica</i>	Meliaceae	Neem	5	<i>Cassia fistula</i>	Caesalpiniaceae	Golden shower tree	6	<i>Cocos nucifera</i>	Arecaceae	Coconut	7	<i>Delonix regia</i>	Caesalpinaceae	Gulmohar Tree	8	<i>Dendrocalamus Strictus</i>	Poaceae	Bamboo	9	<i>Emblica officinalis</i>	Euphorbiaceae	Amla	10	<i>Ficus religiosa</i>	Moraceae	Peepul tree	11	<i>Hibiscus rosa sinensis</i>	Malvaceae	Marigold	12	<i>Mangifera indica</i>	Anacardiaceae	Mango Tree	13	<i>Millingtonia hortensis</i>	Bignoniaceae	Indian Cork Tree	14	<i>Nerium oleander</i>	Apocynaceae	Oleander	15	<i>Polythia longifolia</i>	Anonaceae	Ashok	16	<i>Psidium guajava</i>	Myrtaceae	Guava	17	<i>Syzygium cumini</i>	Myrtaceae	Java plum	18	<i>Tamarindus</i>	Fabaceae	Tamarind Tree
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			<i>indica</i>		
		19	<i>Tecoma stans</i>	Bignoniaceae	Yellow bells
		20	<i>Tectona grandis</i>	Verbenaceae	Teak Tree
29.	Details on pollution control technologies and online monitoring equipments	The incinerator in the proposed project will be installed with air pollution control device with dry scrubbing technology with stack height of minimum 30 meters with online continuous monitoring system for real time monitoring of major parameters at source.			
30.	Details on monitoring of pollutants at source – performance of the incinerator. Including operating hours, fuel consumption, operating parameters (Combustion chamber – temperature, pressure, Stack temperature, total particulate matter, HCl, NOx as per Bio Medical Waste (Management & Handling) Rules 1998.	Proposed Static Dry Incinerator is Dry Technology with fully automation and fitted with Advanced Air Pollution Control Device as per Bio Medical Waste (Management & Handling) Rules 1998 and 2016 & subsequent amendments. Chimney of 30 mtrs height will be provided complete with ladder, inspection platform, continuous online monitoring system, stack drain, aviation light and other accessories. • Dual chambered incinerator–Fixed Hearth Incinerator (Static Type)- 200 Kg/Hrs • Primary chamber operating temp - 800°C±50°C & Secondary operating at 1050°C±50°C. • Residence Time of Flue gases prior exit from Sec. Chamber- 2+ seconds • Refractory & insulation bricks - IS: 8-1994 & IS: 2042-2006 respectively. • Total Organic Carbon (TOC) – In slag and bottom ashes <3% or Loss on Ignition (LoI)< 5% dry weight. • Height of Stack -30 Mtr with sampling port holes • Exit Flue gases temp- <220°C • Incinerator shall be continuously monitored data • Dry scrubbing Unit for flue gas prior release to environment. • 80 liter/hour of diesel Demand of Fuel. • Combustion efficiency (CE) shall be at least 99.00%. • Zero discharge thorough incineration process,			
31.	Stack and fugitive emissions may be monitored for SPM, SO ₂ & NOx as per Bio Medical Waste (Management & Handling) Rules 2016.	Noted. Proposed facility shall follow BMW Rules 2016 and its Subsequent amendments.			
32.	Details of Administrative and technical organizational structure	Details of Administrative and technical organizational structure is present in Chapter-10			
33.	EMP devised to mitigate the	Total project capital cost is proposed INR 1.72/- Crores.			

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adverse impacts of the project should be provided along with itemwise cost of its implementation (Capital and recurring costs).

The proposed cost for the implementation EMP for the project is around INR 46.4/- lakhs as capital cost and INR 16.4 lakhs as recurring cost. Detailed breakup for implementing EMP budget for the project is mention in Chapter no 6 and below:-

EMP Budget

S. No.	Particulars	Capital Cost (Rs) lakhs	Recurring Cost (Rs) lakhs/annum
1	Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc	20	5
2	Odor and Noise Control Measures	5	2
3	Landscaping and Greenbelt Development	5	2
4	Storm Water Drains & Storage Tanks	2	2.5
5	Ambient Air Monitoring & Online Stack Monitoring	10	0.5
6	Ash Disposal	1	4
7	Health Care (Performing free Cataract surgeries, Infrastructure support to area Govt. Hospitals like providing bed and equipment for treatment etc.) COVID financial assistance	0.85	0.10
8	Promoting Education (providing infrastructure like construction of additional class rooms, furniture, smart class facilities, support to special children education /therapy etc. in nearby village)	0.85	0.10
9	Environment care (taking up avenue plantation, Plantation in communities, providing solar power/ lights, rain water harvesting etc.)	0.85	0.10
10	Rural Development (laying roads, construction of drains, community halls, other infrastructure for development of surrounding villages)	0.85	0.10
Total		46.4	16.4

As per the directions given in the MoEF&CC Office Memorandum, F.No. 22-65/2017-IA-III on 30th September 2020, all the proposed activities will be part of

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		Environmental Management Plan (EMP) instead of CER. Addition to above the project proponent has proposed to invest amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project.
34.	Details of the emergency preparedness plan and on-site & off-site disaster management plan.	On-site and Off-site Disaster Management Plan and Emergency preparedness plan are given in Chapter-7
35.	Affidavit to be submitted for the actual surveys done with detailed photographs of monitoring etc.	Complied & Affidavit alongwith Baseline Photographs is attached as Annexure- X.
36.	NOC from UP PCB shall be taken and submitted to SEAC before submission of EIA report.	As per MoEF&CC O.M. – F.No. IA3-22/19/2021-IA.III (E 164361), dated- 20 th September 2021 CTE/CTO will be granted after Environmental Clearance. However, to comply with the conditions we submitted our application for NOC which was turned down by the UP PCB and we were advised to apply only after grant of Environment Clearance. However we assure that we shall apply to obtain NOC from UP Pollution Control Board no sooner we are granted with Environmental Clearance. And we shall not commence any activity at site unless we are granted NOC.
37.	Examine the details of transportation of Hazardous wastes, and its safety in handling.	Proper Care shall be taken to ensure that segregated biomedical waste with proper bar codes handed over by HCEs reach CBWTF without any damage, spillage or unauthorized access. Collection and transportation activities shall be planned so as to ensure zero hazard to human health and environment. A responsible person from CBWTF shall accompany the vehicle for supervision. Vehicles will be only designated for biomedical waste transportation with GPS system and shall not be used for any other purpose. All the records shall be maintained properly in registers. Every time a vehicle is unloaded, the vehicle and empty waste containers shall be washed and properly disinfected. Details are presented in Chapter-2.
38.	Examine and submit the details of on line pollutant monitoring.	As per BMW Rules 2016 and its subsequent amendments. Proposed Project having Dry Static Incinerator with fitted fully automatic Air Pollution Control Device. Parameters to be monitored online include NO _x ,

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		SO ₂ , PM, HCl and the data shall be transmitted real time to the servers at UPPCB (if required by PCB). All necessary air pollution control devices shall be put in place to ensure compliance of emission standards
39.	Examine the details of monitoring of Dioxin and Furon	As per Bio-Medical Waste Management Rules 2016 and its subsequent amendments, The proposed facility utilizes non-chlorinated plastic colored bags only. Wastes to be incinerated shall not be chemically treated with any chlorinated disinfectants. Steps shall be taken to prevent reformation of dioxins by rapidly lowering the flue gas temperatures, to less than 200° C by adopting rapid quenching. As per Bio- Medical Waste Management Rules 2016 and its subsequent amendments, 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).
40.	MoU for disposal of ash through the TSDF	M/s Indo Tech Waste Solution intend to send all the incineration ash to TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi(VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101. M/s Indo Tech Waste Solution will enter into a formal agreement for disposal of ash as soon as all regulatory approvals (EC/CTE etc.) are obtained.
41.	MoU for disposal of scrubbing waste water through CETP	Not required. The wastewater generated from Proposed Facility shall be collected in a sump. Collected waste water shall be treated in In-house Effluent Treatment Plant (ETP) and the treated water shall be reused primarily in APCDs. No treated wastewater shall be let out of the premises of the CBWTF. Details are presented in Chapter-4
42.	Examine and submit details of monitoring of water quality around the landfill site.	No landfill site is proposed within the CBWTF. Ash from Incineration and Sludge from Effluent Treatment Plant shall be disposed off at TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi (VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101. The ground and surface water scenario details are given in Chapter-3
43	Examine and submit details of the odour control measures	The proposed Common Bio-Medical Waste Treatment Facility shall be operated/maintained in compliance with Bio-medical Waste Management Rules 2016 and its subsequent amendments and CPCB/UPPCB/CPHEEO

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		guidelines. • It shall be ensured that the bio-medical waste should be treated within 48hrs of its generation. • During transportation, the containers shall be covered in order to prevent exposure of public to odour and contamination. • Daily washing of waste collecting containers, vehicle compartment and floor of store room. • PPEs/Masks shall be provided to workers to avoid health issues due to odour. • Dilution of odor concentration by spraying Herbal Inocoulums or Ecosorb (organic and biodegradable chemical) around odor generation areas at regular intervals. • Plantation of Indigenous Tree & Root Aroma to reduce the odor and to carry out the process in closed room for controlling/minimizing odor. Details are presented in Chapter 9
44.	Examine and submit details of impact on water body and mitigative measures during rainy season.	The Proposed CBMWTF is Zero Liquid Discharge facility, Hence there will not be any impact on water bodies. Generated Wastewater in the facility shall be treated in In-house Effluent Treatment Plant and the treated water will be use in the APCDs connected to the Incinerator. Details are given in Chapter-4
45.	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.	Detailed Environmental Management Plan has been prepared is provided in Chapter-9 with EMP budget (Including Capital Cost and Annual Recurring Cost) is presented in Chapter-9. A detail of Environmental Monitoring Plan is presented in Chapter- 6.
46.	Water quality around the landfill site shall be monitored regularly to examine the impact on the ground water.	No landfill is proposed for the facility. Ground and Surface water samples were collected around the proposed site within 10 km Radius. All samples were analyzed for physical and chemical characteristics. Sampling Location & Analysis Results are given in Chapter-3
47.	The storage and handling of hazardous wastes shall be as per the Hazardous Waste Management Rules	The Proposed Facility will follow Hazardous & Other Waste (Management & Transboundary Movement) Rules 2016 and its amendments thereafter.
48.	Submit details of a comprehensive Disaster Management Plan including	On-site and Off-site Disaster Management Plan and Emergency preparedness plan are given in Chapter-7

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	emergency evacuation during natural and man-made disaster	
49.	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.	Public Hearing for the proposed project was conducted on 06.06.2022 (12:30 PM) at "Collectorate Office, Kasganj, Uttar Pradesh in accordance with the EIA notification 2006 & SPCB and its proceedings are incorporated in Final EIA/EMP report. The Public Hearing is organised by Uttar Pradesh Pollution Control Board and Presided by District Magistrate, Kasganj, Uttar Pradesh.
50	A detailed draft EIA/EMP report should be prepared in accordance with the above additional TOR and should be submitted to the Ministry in accordance with the Notification.	Followed & Complied.
51.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	There is no litigation is pending against the proposed project. Hence not applicable.
52.	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Noted & Complied.

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EXECUTIVE SUMMARY

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INTRODUCTION

Rapid growth in population, severe environmental degradation and increased awareness about the health care has created a need for a wide variety of medical facilities. Medical care is vital for our life and health, but the Bio-Medical Wastes generated from medical activities and the hospitals represents a real problem of living nature and human world and that are incompatible with the environment.

The concept of Common Bio-Medical Waste Treatment Facility not only addresses these problems but also prevents scattering of treatment equipment in the city/ area. Moreover, monitoring of these facilities is much easier rather than scattered captive Bio-Medical Waste Treatment Facility and one can be ensured of cleaner and safer environment.

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.
- Collection of Segregated Biomedical Waste and its transportation, storage, treatment and disposal in accordance to the Bio-Medical Waste Management Rules 2016.
- Compliances with statutory and environmental norms.
- Develop concise waste management principles.
- 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.

The present proposal by M/s Indo Tech Waste Solution is to utilize 0.408 Hectare (4081 Sq.m.) of land for setting up of Common Bio-Medical Waste Treatment Facility at Khasra No- 1161 at Village-Kumroua, Block- Saron, Tehsil& District- Kasganj Uttar Pradesh.

The Proposed project of CBMWTF which falls under Category B, Schedule 7(da) as “Bio-medical Waste Treatment Facility” as per the EIA notification 14th September, 2006 and subsequent amendments dated 1st December 2009, 17th April 2015, 21st December 2016 and 27th March 2018 and so on. The setting up of CBMWTF attracts the directions of National Green Tribunal dated 28th November, 2013 making Environmental Clearance from MoEF&CC mandatory.

PROJECT DETAILS

The proposed Common Bio-Medical Waste Treatment Facility will be established in a land of 4081 Sq.m. (0.408 Ha.) located approximate 01 km from Pachlana village. The Proposed Land is taken on

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lease by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution for 15 years. Also, NOC from the Gram Panchayat (Kumroua village) was obtained on 14.01.2021 for the proposed project. The proposed project having capacity to cater around 10,000 beds with a treatment capacity of 7.2 Tonne/day. The project will be developed as in accordance with local development plan. The proposed site proves to be the suitable location considering both the environmental and economic factors. The nearest habitation from the proposed site is Nagla Mukhram (approx. 802 meter NE and Pachlana Village (approx. 01 Km North North East direction w.r.t site). Nearest railway station is Kasganj Railway Station (approx. 16.10 Km South) and nearest airport is Agra (Pandit Deen Dayal Upadhyay) Airport at areal distance of 110 Km at South West direction with respect to proposed project site.

LAND DETAILS

The proposed Common Bio-Medical Waste Treatment Facility will be established in an area of 0.408 Ha. (4081 Sq. m.) located at Khasra No. 1161, Village-Kumroua, Block- Saron, Tehsil & District- Kasganj Uttar Pradesh. The proposed land has been applied for conversion for industrial land use to establish the proposed common bio-medical waste treatment facility via Revenue Council Uttar Pradesh online portal case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amendment 2016) section 80 (1) on dated; 11.10.2021, thus the land use will change from agriculture land to industrial land. The Proposed Land is taken on lease for 15 years by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution.

Table 1 Land Details

S. No	Tehsil	Village	Khasra/Plot/Block No.	Hactares
1	Kasganj	Kumroua	Khasra No- 1161	0.408
Ownership: The Proposed Land is taken on lease by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution for 15 years. Also, NOC from the Gram Panchayat (Kumroua village) was obtained on 14.01.2021 for the proposed project.				

Table: 2 Project Land Breakup Details

S.No.	Components/Particular	Area in SQ.M.	Percentage
1	Build up Area (Autoclave, Shredder etc)	831.00	20.36
2	Incinerator Area	334.00	8.18
3	E.T.P Area	25.00	0.61
4	Road Area	1055.00	25.85
5	Green Belt	1347.00	33.00
6	Open Area	489.00	11.98
Total Area		4081.00	100

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Table: 3 Salient Features

Nature of the Project	Common Bio-medical Waste Treatment Facility (CBMWTF)		
Project Proponent	M/s Indo Tech Waste Solution		
Location& GPS Co-ordinates	Village-Kumroua, Block- Saron, Tehsil & District- Kasganj Uttar Pradesh		
	Sr. No.	Latitude	Longitude
	A	27°57'28.14"	78°36'34.74"
	B	27°57'29.41"	78°36'37.18"
	C	27°57'30.85"	78°36'36.09"
	D	27°57'29.53"	78°36'33.70"
Toposheet No.	45I/9, 53L/12, 54I/5 & 53L/8		
Land Area	0.408 Hectare (4081 Sq. m.)		
Project Capacity	The proposed project having capacity to cater around 10,000 beds with a treatment capacity of 7.2 Tonne/day. At present the project is to cater a waste quantity of around 10000 beds from surrounding hospitals. The proposed treatment facilities at the site are: • Autoclaving: 250kg/batch • Shredding: 150kg/hrs • Incineration: 200kg/hrs • ETP: 5 KLD		
Water Requirement	Total 5 KLD water is required for the proposed project. Source: Bore Well & External Water Tankers		
	S. No.	Particulars	Water Demand (KLD)
	1.	Water Sprinkling. Floor Washing, Vehicle Washing etc	1.4 KLD
	2.	Boiler Blow Down	0.1 KLD
	3.	Domestic Use	2 KLD
	4.	Green Belt Development	1.5 KLD
	Total		5 KLD
Power Requirement	Total Power Requirement- 63 KW Source- Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL) Backup- 62.5 KVA DG Set		
Manpower Requirement	42 Person (Operation Phase)+15 person (Construction Phase)		
Project Cost	Rs.1.72 Crores		
Land Ownership	Proposed Land is taken on lease by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution for 15 years. Land Document attached as an Annexure-II		
Nearest Town and Habitation	Nagla Mukhram 802 meter in NE and Pachlana 1 Km in NNE		
Nearest Railway Station	Kasganj Railway Station (16.10 km in S)		
Nearest Airport	Agra (Pandit Deen Dayal Upadhyay) Airport (110 km in SW)		
Nearest Highway	No Highways within 10 km radius of proposed project site. However, the proposed project site is connected with MDR 82W (major district road) - 0.07km in W and nearest Highway (state) -33 is at 14.90 Km (SE direction).		

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BASELINE ENVIRONMENTAL STATUS

Baseline environmental status in and around the proposed project site depicts the existing environmental conditions of Air, Noise, Water, Soil, Biological and Socio-economic environment. Considering the project as the centre, a radial distance of 10 km is deemed as 'study area' for baseline data collection and environmental monitoring. Baseline data was collected for various environmental attributes so as to compute the impacts that are likely to arise due to proposed Common Bio-Medical Waste Treatment Facility at Village- Kumraua, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh. The baseline data generation has been carried out in the summer season (March-May 2021).

The metrological data is collected from the IMD station at Aligarh the pre dominant wind direction recorded is from North West. Average wind speed observed for the winter season is around 2.13 m/s.

Ambient Air Quality

Ambient air quality monitoring stations were set up for 8 different locations. The locations were selected in downwind, cross wind and up wind of the proposed project. The common air pollutants namely Particulate matter (PM_{10} & $PM_{2.5}$), Sulphur dioxide (SO_2), the oxides of nitrogen (NO_x), Carbon Monoxide (CO), Ammonia (NH_3), Benzene (C_6H_6), Methane (CH_4), Lead (Pb), Nickel (Ni), Ozone (O_3), Arsenic (As), Hydrogen sulfide (H_2S) and Benzo (a) Pyrene (BaP) were sampled on 8/24 hourly and results were averaged to 24 hours to meet the requirements of the MoEF&CC and compared with the standards stipulated by CPCB.

The 98th percentile of above mention pollutants were assessed and calculated as mention below:

- PM_{10} value recorded during the study period ranges between 62.27 to 94.81 $\mu g/m^3$.
- $PM_{2.5}$ value recorded during the study period ranges between 33.37 to 46.44 $\mu g/m^3$.
- SO_2 value recorded during the study period ranges between 8.57 to 15.69 $\mu g/m^3$
- NO_2 value recorded during the study period ranges between 14.47 to 18.63 $\mu g/m^3$
- NH_3 value recorded during the study period ranges between 39.67 to 60.90 $\mu g/m^3$
- CO value recorded during the study period ranges between 0.90 to 1.01 mg/m^3

From the baseline monitoring result, it is observed that the monitored parameters (PM_{10} , $PM_{2.5}$, SO_2 , NO_2 , NH_3 , CO) are within the permissible limits as per NAAQS, 2009 during the study period.

Water Quality Monitoring

Ground water samples were collected from different sources within the study area and analyzed for all important physico-chemical and biological parameters to establish the quality of water prevailing in the project surroundings. Around 8 ground water and 3 surface water samples were collected.

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Ground Water Quality:

- The pH limit fixed for drinking water samples as per IS 10500-2012 is 6.5 to 8.5 beyond this range the water will affect the mucus membrane and or water supply system. During study period the pH in the ground water samples was varying from 6.96 to 7.28. The pH of all samples was falling within the acceptable limit.
- The acceptable limit for total dissolved solids as per IS 10500:2012 is 500 mg/l, whereas the permissible limit in absence of alternate source is 2000 mg/l, beyond this palatability decreases and may cause gastro intestinal irritation. In water samples collected from the study area, the total dissolved solids in groundwater are varying from 216 to 703 mg/l. Six sample is falling within acceptable limit and two samples are falling above acceptable limit but within permissible limit.
- The acceptable limit for chloride is 250 mg/l as per IS10500:2012 whereas the permissible limit of the same is 1000 mg/l beyond this limit taste, corrosion and palatability are affected. The Chloride levels in the ground water samples collected in the study area were ranging from 16 to 74 mg/l. All samples are falling within acceptable limit.
- The acceptable limit as per IS10500:2012 for hardness is 200mg/l whereas the permissible limit for the same is 600mg/l beyond this limit encrustation in water supply structure and adverse effects on domestic use will be observed. In the water samples collected from the study area, the hardness is varying from 144 to 388 mg/l. All three samples are falling above the acceptable limit and five samples are falling above the acceptable limit but within permissible limits.

Surface Water

- The pH was varying between 7.11 to 7.29. The pH values for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS: 2296-1992.
- The total dissolved solids were in the range of 122 to 156 mg/l. The TDS for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS:2296-1992.
- The chlorides were in the range of 11 to 14 mg/l, indicating that all samples were meeting the Class 'A' norms as per IS: 2296-1992.
- The total hardness is varying between 80 to 98 mg/l. n which all samples are meeting the Class 'A' norms as per IS: 2296-1992.
- DO for the all the surface water smaples varies between 7.0 to 7.8 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992.
- BOD for the all the surface water smaples varies between 1.9 to 2.5 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992.

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Hence, the above analysis result of surface water quality are indicating & meets the Class 'B' norms as per IS: 2296-1992.

Noise Monitoring

The day noise levels have been monitored during 6.00 am to 10.00 pm and night noise levels during 10.00 pm to 6.00 am, at all the 8 locations covered in 10 km radius of the study area. The day equivalents during the study period are range between 49.7 to 52.8dB (A), whereas the night equivalents were in the range of 35.7 to 39.0dB (A). From the results it can be seen that the day equivalents and the Night equivalents were within the Ambient Noise standards of residential.

Soil Quality

The analytical soil samples results collected during the study period is summarized below. The pH of the soil is an important property; plants cannot grow in low and high pH value soils. The normal range of the soils is 6.0 to 8.5 are called as normal to saline in soils. Most of the essential nutrients like N, P, K and Cl are available in plants at the neutral pH except for zinc and manganese which are available at low pH range. The soils having pH below 7 are considered to be acidic from the practical stand point, those with pH less than 5.5 and which respond to limiting may be considered to qualify to be designated as acidic soils. On the basis of pH measurements the degree of soil acidity may be indicated.

- The pH values in the study area are varying from **7.69 to 8.56** indicating that all soils are falling in normal to saline class.
- The electrical conductivity in the study area is varying from **289 to 456 $\mu\text{S}/\text{cm}$** indicating that all samples are falling in normal range.
- The other important parameters for characterization of soil for irrigation are N, P and K are known as primary nutrients and Ca, Mn and S as secondary nutrients. The primary and secondary nutrients are known as major elements. The classification is based on their relative abundance, and not on their relative importance.
- The available potassium in the study area is varying between **105.7 to 148.3 Kg/Ha** indicating that all samples are falling in medium range except one sample which is falling in Low range.

Ecological Environment

Survey of Ecology and Biodiversity of the proposed Common Bio-medical Waste Treatment Facility at Kasganj was carried out during study period. The expert has carried out flora and fauna survey by collecting the information of biological environment of Uttar Pradesh, their forests, type of forest and forest cover in Uttar Pradesh & the floral species from the government and forest website. Further details of type of flora, botanical name, family use & fauna of the area have been studied by collecting the details by forest department. The secondary data so collected were also verified by the field survey.

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The Ecological and Biological study of terrestrial flora, fauna and aquatic biota has been carried with an aim to establish different transects in the 10 K.M radius. An insight of terrestrial fauna was carried out to gain required knowledge about species of carnivores, ungulates, non-human primates, birds, reptiles and invertebrates etc.

The biological study of the area has been conducted in order to understand the ecological status of the existing flora and fauna to generate baseline information and evaluate the probable impacts on the biological environment.

Green belt development

The Unit in an area of 4081 Sq.m. Greenbelt is recommended as one of the major components of Environment Management Plan. The proposed greenbelt area is about 1348 Sq.m (33.01 %). As per MoEF&CC guidelines total no. of trees for greenbelt of 1348 Sq.m would be about 107 nos.

Socio – Economic Environment

Total population of the study area is 125026 persons. Out of which 67554 are male and 57472 are female. In SC category 10271 female to 11639 male and there is no ST category population in study area.

Literacy Rate is the amount of people in a country with the ability to read and write. The analysis of the literacy levels is done in the study area. Literacy in any region is key for socio-economic progress and the Indian literacy rate grew to 59.36% in 2011. The study area experiences a considerably average literacy rate of 51.14% (2011).

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The potential impacts on the environment from the proposed project are identified based on the nature of the various activities associated not only with the project implementation and operation, but also on the current status of the environmental quality at the project site. The proposed project may cause impact on the environment in two phases i.e. Impact during Construction Phase & Impact during Operation Phase which are well explained in Chapter-4.

ENVIRONMENT MANAGEMENT PLAN

The Environmental Management Plan (EMP) is required to ensure a sustainable development of the plant area and the surrounding areas of the plant. The EMP will be integrated in all the major activities of the project, with clearly defined policies, to ensure that the ecological balance of the area is maintained and the adverse effects are minimized. EMP requires multidisciplinary approach with mitigation, management, monitoring and institutional measures to be taken during implementation and operation, to eliminate adverse environmental impacts or reduce them to acceptable levels. In

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order to ensure sustainable development in the study area; it needs to be an all-encompassing plan for which the plant authorities, government, regulating agencies, and the population of the study area need to extend their cooperation and contribution. Total project capital investment is Rs 1.72/- crore and on environmental improvement works is envisaged Rs. 46.4/- lakhs and recurring expenditure during the stage of operation is Rs. 16.4/- lakhs as recurring investment is earmarks for EMP and as per the directions given in the MoEF&CC Office Memorandum, F.No. 22-65/2017-IA-III on 30th September 2020, all the proposed activities will be part of Environmental Management Plan (EMP) instead of CER.

EMP Budget

S. No.	Particulars	Capital Cost (Rs) lakhs	Recurring Cost (Rs) lakhs/annum
1	Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc	20	5
2	Odor and Noise Control Measures	5	2
3	Landscaping and Greenbelt Development	5	2
4	Storm Water Drains & Storage Tanks	2	2.5
5	Ambient Air Monitoring & Online Stack Monitoring	10	0.5
6	Ash Storage & Disposal	1	4
7	Health Care (Performing free Cataract surgeries, Infrastructure support to area Govt. Hospitals like providing bed and equipment for treatment etc.) COVID financial assistance	0.85	0.10
8	Promoting Education (providing infrastructure like construction of additional class rooms, furniture, smart class facilities, support to special children education /therapy etc. in nearby village)	0.85	0.10
9	Environment care (taking up avenue plantation, Plantation in communities, providing solar power/ lights, rain water harvesting etc.)	0.85	0.10
10	Rural Development (laying roads, construction of drains, community halls, other infrastructure for development of surrounding villages)	0.85	0.10
Total		46.4	16.4

Addition to above the project proponent has proposed to invest amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project.

The mitigation measures are planned for construction and operation phases and the overall management plan helps to improve the supportive capacity of the receiving bodies. The EMP aims to control pollution at the source level to the possible extent with the available and affordable technology

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followed by the standard treatments before getting discharged. The recommended mitigation measures will synchronize the economic development of the study area with the environmental protection of the region.

ENVIRONMENT MONITORING PROGRAM

Environmental monitoring program describes the processes and activities that need to take place to characterize and 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. Different activities involved in the proposed project and their impact on various environmental attributes have been taken into account while designing a detailed environmental monitoring program. Environmental monitoring program has been prepared for the proposed project for assessing the efficiency of implementation of Environment Management Plan and to take corrective measures in case of any degradation in the surrounding environment. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project.

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 design of a monitoring program must therefore have regard to the final use of the data before monitoring starts. The monitoring program will have three phases:

- Construction phase
- Operational Phase

PROJECT BENEFITS

As per Bio-Medical Wastes Management Rules 2016 and its subsequent amendments under the aegis of Environment (Protection) Act, 1986. These wastes need professional attention for effective management as the infectious nature of the waste can cause irreparable damage to the human health and the environment. It has become imperative to monitor and control the management and handling of these wastes.

Due to the proposed facility, hazardous bio medical waste will be properly treated and disposed but lack of segregation practices, results in mixing of hospital wastes with general waste making the whole waste stream hazardous. Inappropriate segregation ultimately results in an incorrect method of waste disposal. Various communicable diseases, which spread through water, sweat, blood, body fluids and contaminated organs, are important to be prevented. The bio medical waste spread in and around the

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hospitals calls flies, insects, rodents, cats and dogs that are responsible for the spread of communication disease like plague and rabies. Rag pickers in the hospital, sorting out the garbage are at a risk of getting tetanus and HIV infections. The recycling of disposable syringes, needles and other article like glass bottles without proper sterilization are responsible for Hepatitis, HIV, and other viral diseases. From the proposed facility these kinds of diseases shall be prevented to be spread from the bio medical wastes.

For the proposed facility required skilled and unskilled laborers will be utilized maximum from the local area. The increasing health care facilities increase the demand of bio medical waste management, to some extent.

CONCLUSION

The EIA study has made an overall assessment of the potential and anticipated environmental impacts likely to arise from the development of proposed Common Bio-medical Waste Treatment Facility. Baseline data was collected for various environmental attributes so as to compute the impacts that are likely to arise due to proposed developmental activity. The potential impacts on the environment from the proposed project are identified based on the nature of the various activities associated not only with the project implementation and operation, but also on the current status of the environmental quality at the project site. Mitigation measures are proposed to minimize the adverse impacts if any due to the project in the form of Environment Management Plan (EMP) including its budget. Overall cost of the project has been worked out at Rs.1.72/- Crores for proposed plant.

In brief it can be concluded that, the proposed activities will not produce adverse impact on sanitation, communication and community health, as sufficient measures have been proposed to be taken under the EMP. Due to proposed project, the surrounding environment will not face any problem related to pollution because wastes will be handled properly and No alteration in transport routes will be required. The proposed project will improve the sanitation condition of region, help health facilities for scientific and proper disposal of waste which improves the health services quality and will reduce the risk of infections & spread of diseases i.e the over all impact due to unscientific bio-medical waste dumping.

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CHAPTER-I

INTRODUCTION

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. –Kumraua, Dist.- Kasganj, U.P
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Chapter 1

Introduction

1.1 Introduction

According to Bio-Medical Waste Management Rules 2016 and its subsequent amendments, “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”*.

Improper management of waste generated in health care facilities causes a direct health impact on the community, the health care workers and on the environment. Every day, significant amount of potentially infectious bio-medical waste is generated around the world. Indiscriminate disposal of bio-medical waste and exposure to such waste possess serious threat to environment and to human health and so bio-medical waste requires specific treatment and management prior to its final disposal.

Biomedical waste can be managed properly by ensuring proper segregation at the source, the use of accurate packaging (leak resistant, puncture resistant and not susceptible to degradation by cleaning agents in case the packaging is reused), appropriate color coding, proper in-house movement of waste (minimizing employee exposure to biomedical waste in a workplace), designating waste storage areas and can be disposed of through incineration or decontamination by heating with steam under pressure in an autoclave.

Common Bio Medical Waste Treatment Facility is a set-up where bio medical waste generated from a number of health care units, is imparted necessary treatment to reduce adverse impacts on the human health and environment. Bio-medical waste is generated during the diagnostic procedures, treatment or immunization of human beings or animals, research activities pertaining to the production or testing biological. Bio-medical waste is of hazardous category and if not managed properly, it may cause serious community health hazards. Therefore, Ministry of Environment, Forest & Climate Change (MoEFCC), Government of India along with Central Pollution Control Board (CPCB) has made it mandatory for each and every health care facility to segregate, collect and manage the waste of this category as per stipulated bio-medical waste management rule, 2016 & its subsequent amendments and guidelines.

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1.2 Common Bio-medical Waste Treatment Facility (CBWTF)

Common Biomedical Waste Treatment and Disposal Facility (CBWTF) provide services to Health Care Units for collection of BMWs for its final treatment and disposal to their site. Biomedical Waste Management Rules 2016 and its subsequent amendments, stipulates that occupier of every organization generating biomedical waste (as defined in the Rules) must manage his biomedical waste as prescribed in the Rules so as not to cause any harm to the environment.

Common Bio-Medical Waste Treatment Facility plays an important role to curb the infectious diseases that spreads from the bio-medical wastes without proper treatment. The concern about disposal of infectious wastes generated by the health care units is increasing rapidly due to the fear of the spread of viruses. These wastes (bio-medical wastes generated from health care establishments) present a high risk of causing potential damage to the human health and the environment by way of spreading. To prevent the spread of such infectious disease causing vectors, a scientific approach is required. It is essential that professionally trained personnel should handle the wastes and that the wastes should be disposed scientifically.

Ministry of Environment, Forest & Climate Change (MoEFCC) notified amendment to the EIA Notification 2006 published vide MoEFCC Notification of S.O. 1142 (E) dated April 17, 2015. According to this notification, the bio-medical waste treatment facility is categorized under the Item 7 (da) in the schedule, requiring 'environmental clearance' from the State Environment Impact Assessment Authority (SEIAA)/ State Expert Appraisal Committee (SEAC). The SEIAA has given ToR vide its letter No-93/Parya/SEIAA/6191/2021 dated 11 June 2021 attached as annexure – I. The project details are given in Table 1.1.

TABLE 1.1 PROJECT DETAILS

S. No.	Parameters	Description
1.	Proposed Project	Common Bio-medical Waste Treatment Facility
2.	Project Activity	7(da)- Common Bio-Medical Waste Treatment Facilities (CBWTF)
3.	Proposed Project Capacity	The proposed project has been designed to cater 10,000 beds per day. Currently available Biomedical Waste is - 10,000 beds. As per latest UPPCB report enclosed as annexure – IV. The proposed project will cover 75km or more if required as per authority requirements. Proposed Equipments:- Incinerator- 200 kg/hour

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		Autoclave- 250 kg/batch or 2500ltr/hour Shredder- 150 kg/hour Effluent Treatment Plant- 5 KLD															
4.	Location	Kumraua Village, Block- Soron District- Kasganj, Uttar Pradesh <table border="1"> <thead> <tr> <th>S.No.</th><th>Latitude</th><th>Longitude</th></tr> </thead> <tbody> <tr> <td>A</td><td>27°57'28.14"</td><td>78°36'34.74"</td></tr> <tr> <td>B</td><td>27°57'29.41"</td><td>78°36'37.18"</td></tr> <tr> <td>C</td><td>27°57'30.85"</td><td>78°36'36.09"</td></tr> <tr> <td>D</td><td>27°57'29.53"</td><td>78°36'33.70"</td></tr> </tbody> </table>	S.No.	Latitude	Longitude	A	27°57'28.14"	78°36'34.74"	B	27°57'29.41"	78°36'37.18"	C	27°57'30.85"	78°36'36.09"	D	27°57'29.53"	78°36'33.70"
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C	27°57'30.85"	78°36'36.09"															
D	27°57'29.53"	78°36'33.70"															
5.	Total Area	4081 Sqm (0.408 ha) Layout Plant including all the components of project in figure no. 2.4 Chapter -2.															
6.	Plot No/Khasra No-	Khasra No- 1161															
7.	Land Ownership	The proposed land is taken on Lease for 15 years by Mr. Raman Kumar of M/s Indo Tech Waste Solution. Land Lease Agreement is enclosed as annexure – II. NOC from the Gram Panchayat (Kumroua village) was obtained on 14.01.2021 for the proposed project. NOC letter is attached as annexure – IV. Also, M/s Indo Tech Waste Solution has applied for conversion for land use via Revenue Council Uttar Pradesh online portal case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amendment 2016) section 80 (1) on dated; 11.10.2021 for the purpose of establishment of the proposed common bio-medical waste treatment facility. Application letter is enclosed as annexure – V.															
8.	Water Requirement & Source	Water requirement for the proposed CBWTF project is approx. 5 KLD. Source: Bore Well & External Water Tankers.															
9.	Project Cost	Rs- 172/-Lakhs (1.72/- Crore)															
10.	Nearest Water Bodies/Rivers	Paraller Lower Ganga Canal- 2.93km (W) Burhiganga Nala- 3.94km (E) Ganga River- 4.31km (N)															
11.	Power Requirement & Source	62 KW, Source- Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL). DG set (62.5 KVA) is proposed for power backup.															
12.	Manpower Requirement	During Construction phase approx.-15 persons will be hired from nearby Villages of impact area around 10 KM preferably and in absence of such															

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		cases we hire from outside. Number of persons required in operational phase- 42no.
11.	Nearest Railway Station	Kasganj Railway Station – 16.10 km in S
12.	Nearest Airport	Agra (Pt. Deen Dayal Upadhyay) Airport- 110km in SW
13.	Nearest Highway	No Higways within 10 km radius of proposed project site. However, the proposed project site is connencted with MDR 82W (major district road) - 0.07km in W and nearst Highway (state) -33 is at 14.90 Km (SE direction).
14.	Nearest Town/Habitation	Nagla Mukhram 802 meter in NE and Pachlana 1 Km in NNE.
15.	Seismic Zone	Seismic Zone- IV

1.3 Identification of Project and Project Proponent

1.3.1 Necessity of the Project

In Uttar Pradesh most of the Hospitals, Primary Health Care establishments, etc., does not have treatment facilities. Kasganj district also does not have any Common Bio-medical Waste Management Facility on its own. As per BMW Rules 2016 there is no CBWTF is available within 75Km radius.

And it may not be possible for small nursing homes, dispensaries, clinical laboratories and other small organizations or individual medical professionals to carry out treatment and disposal of bio-medical waste generated as per the methods prescribed in the rules on their own. It is not economical for even bigger hospitals to have their own treatment facilities.

The proposed project will collect wastes as categorized under the Bio-medical Waste Management Rules, 2016, generated from all health care establishments within a radius of 75 km or more if required as per authority requirement. The collected waste will be transported to the project site, treated and disposed-off as per the stipulated options provided in the BMW Management Rules, 2016.

Proper collection and timely treatment of COVID waste is extremely important to control the spread of the disease. It is proposed to collect and treat COVID waste in compliance with Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of COVID-19 Patients and its subsequent amendments & revisions (i.e Revision - 05) by CPCB dated April 26, 2022.

Details of categories of bio-medical waste and its mode of treatment are presented in following Table-

1.2

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
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TABLE 1.2 CATEGORIES OF BIO-MEDICAL WASTE WITH TREATMENT AND DISPOSAL OPTIONS

Category	Type of Waste	Type of Bag or Container to be used	Treatment and Disposal Options	Treatment and Disposal Option to be adopted at the proposed CBWTF
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 coloured non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or deep burial	Incineration
	(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.		Incineration deep burial or Plasma Pyrolysis or In absence of above facilities, Autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery.	Incineration
	(d) Expired or Discarded Medicines Pharmaceutical	Yellow coloured non-chlorinated plastic bags or	Expired cytotoxic drugs and items contaminated	

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	waste Like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc	containers	with cytotoxic drugs to be returned back to the manufacturer or supplier for Incineration at temperature >1200°C or to common bio-medical waste treatment facility or hazardous waste treatment, storage and disposal facility for incineration at >1200°C or Encapsulation or Plasma Pyrolysis at >1200°C. All other discarded medicines shall be either sent back to manufacturer or disposed by incineration.	
	(e) Chemical Waste Chemicals used in production of biological and used or discarded disinfectants.	Yellow coloured containers or non-chlorinated plastic bags	Disposed of by incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility.	Incineration
	(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	Separate collection system leading to effluent treatment system	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms	Not accepted at the CBWTF

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	from laboratories and floor washings, cleaning, house-keeping and disinfecting activities etc.			
	(g) Discarded linen, mattresses, beddings contaminated	Non chlorinated yellow plastic bags or suitable packing material	Non- chlorinated chemical disinfection followed by incineration or Plasma Pyrolysis or for energy recovery. In absence of above facilities, shredding or mutilation or combination of Sterilization and shredding. Treated waste to be sent for energy recovery or incineration or Plasma Pyrolysis	Incineration
	(h) Microbiology, Biotechnology and other clinical laboratory waste Blood bags Laboratory cultures, stocks or specimens of micro- organisms, 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 or Microwave or Hydroclave safe plastic bags or containers”;	Pre-treat to sterilize with non-chlorinated chemicals on-site “as per World Health Organisation guidelines on Safe management of wastes from health care activities and WHO Blue Book,2014 and thereafter sent for incineration”;	Incineration
Red	Contaminated Waste (Recyclable) (a) Wastes generated from disposable items such as tubing,	Red coloured nonchlorinated plastic bags or containers	Autoclaving or micro-waving/ hydroclaving followed by shredding or	Autoclave

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	bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes) and vacutainers with their needles cut) and gloves.		mutilation or combination of sterilization and shredding. Treated waste to be sent to 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.	
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	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.	Autoclave

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Blue	(a)Glassware: Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.	Puncture proof and leak proof boxes or containers with blue colored marking”;	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or	Autoclave
	(b) Metallic Body Implants	Puncture proof and leak proof boxes or containers with blue colored marking”;	through autoclaving or microwaving or hydroclaving and then sent for recycling.	
COVID – 19 (Separately labled bins) Red Bags - PPEs such as goggles, face-shield, splash proof apron, Plastic Coverall, Hazmet suit, nitrile gloves. Yellow Bags- mask, head cover/cap, shoe-cover, disposable linen Gown, non-plastic or semi-plastic & tissues and toiletries, of COVID-19 patients	Healthcare Facilities having isolation wards including temporary Healthcare Facilities like rail coach wards, COVID Care Centers etc. for COVID-19 infected patients	Double layered bags (using 2 bags) should be used for collection of waste from COVID-19 isolation wards. Use a dedicated collection bin labelled as “COVID-19” to store COVID-19 waste and keep separately in temporary storage room prior to handing over to authorized staff of CBWTF.	As per BMW Rule, 2016 and its amedments & Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of COVID-19 Patients - Revision - 05 by CPCB dated April 26, 2022.	

1.3.2 Project Proponent

A group of professional, with the vision of entering into socially relevant and environmentally conscious areas, joined hands to promote the firm in the name of “Indo Tech Waste Solution”. The promoter of the company is working in this service industry for more than ten years. The Company has also registered in MSME, Government of India, vide Certificate no. UDYAM-HR-03-0023581 dt; 09.09.21. The

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MSME certificate of M/s Indo Tech Waste Solution is enclosed as annexure – VI. The promoter proposed to put up the CBWTF in district Kasganj, Uttar Pradesh identified to cover waste generated in and around area covering radius of 75 k.m or more if required (from this facility, having 10,000 beds approx.) During Construction phase the labours and workers will be hired from nearby villages. Number of persons required in operational phase will be as per the requirement when the plant is operational and will help in generating employment. It will be ensured that collection, transportation, storage & treatment of Bio-medical waste is done in a systematic manner by complying all regulatory norms as stipulated in Bio-medical Waste Management Rules 2016 and as per CPCB Guidelines for installation of Bio-medical Waste Treatment Facility.

1.4 Brief Description of Nature, Size, Location of the Project & Its Importance to the Country, Region.

1.4.1 Nature of the Project

The basic principle of good BMW practice is based on the concept of 4Rs, namely, reduce, reuse, recycle, and recover. The best BMW management (BMWM) methods aim at avoiding generation of waste or recovering as much as waste as possible, rather than disposing. Therefore, the various methods of BMW disposal, according to their desirability, are prevent, reduce, reuse, recycle, recover, treat, and lastly dispose. Hence, the waste should be tackled at source rather than end of pipe approach. Common Bio Medical Waste treatment and disposal facility means any facility wherein treatment, disposal of BMW or processes incidental to such treatment and disposal is carried out.

As per the Gazette Notification dated 28th March, 2016 it is the duty of every occupier (a person having control over an institution or premises) of an institution generating biomedical waste including a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment. The facility shall follow the rules of Bio-Medical Waste Management Rules, 2016 and subsequent amendments.

1.4.2 Size of the Project

The proposed facility will be set up at 0.408 Hectare (4081 Sq. m.) land. The total cost of the project is estimated to be Rs.1.72 crores

The following are the proposed Equipment's/Machineries to be installed in the plant.

TABLE 1.3 EQUIPMENT'S CAPACITY AND NUMBER

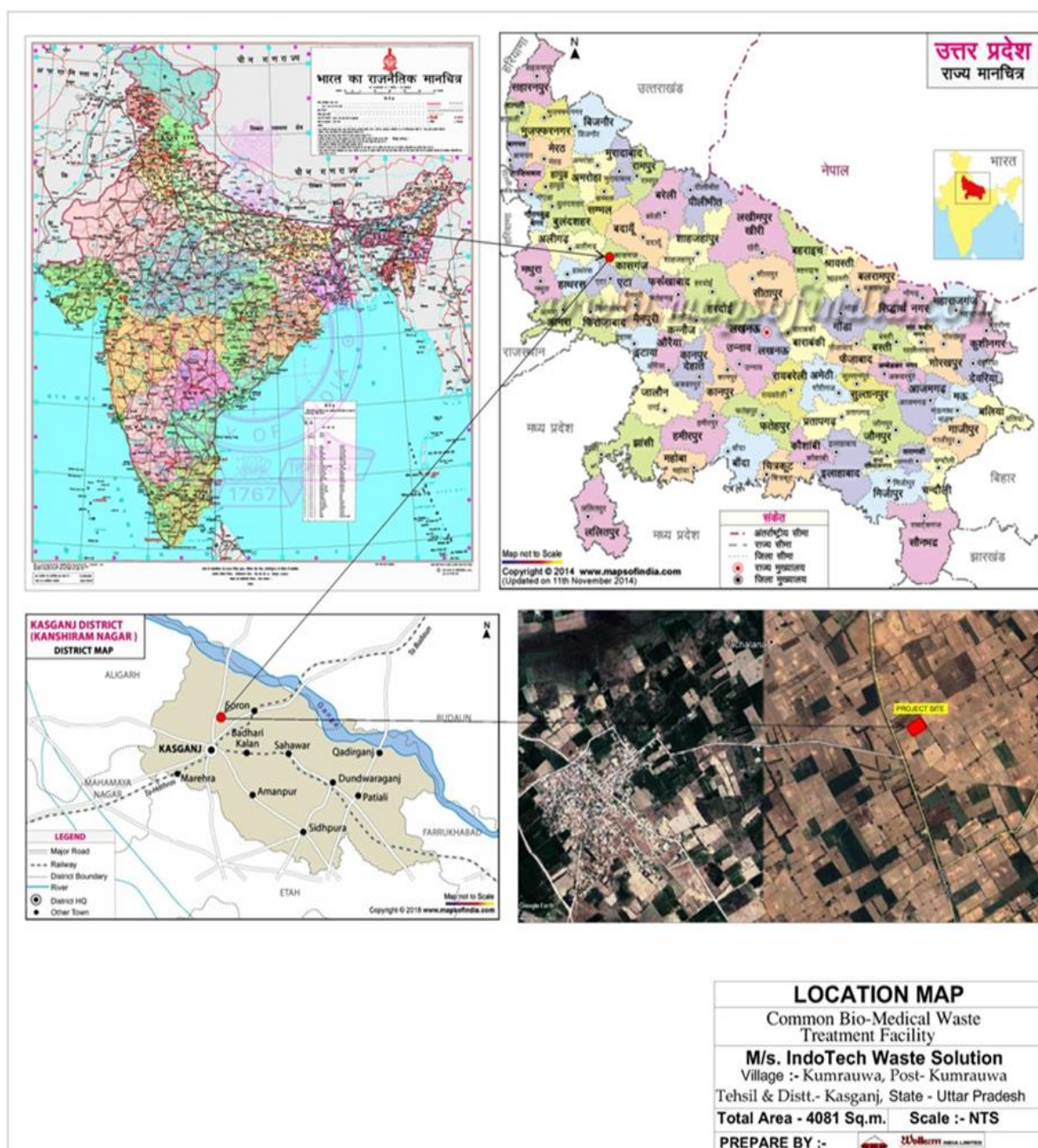
Sr. No	Equipment/ Machinery	Capacity	Nos
1	Static Dry Incinerator	200 kg/hour	1
2	Horizontal Cylindrical Autoclave	2500 ltr/hour or 250 kg/batch	1
3	Shredder	150 kg/hour	1
4	Effluent Treatment Plant	5 KLD	1

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1.4.3 Location of the Project

The proposed Common Bio-Medical Waste Treatment Facility will be established in an area of 0.408 Hectare (4081 Sq. m.) located at Khasra No. 1161, Village-Kumraua, Block- Soron, Tehsil & District- Kasganj Uttar Pradesh. M/s Indo Tech Waste Solution has applied for conversion for land use via Revenue Council, Uttar Pradesh online portal - case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amendment 2016) section 80 (1) on dated; 11.10.2021 for the purpose of establishment of the proposed common bio-medical waste treatment facility. Application letter is enclosed as annexure – V. Figure 1.1 Shows the Project Location.

FIGURE 1.1: LOCATION MAP



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1.4.4 Importance to the Country & Region

Inadequate biomedical waste management causes severe threats at community level. There are some common bio-medical waste treatment and disposal facility exist in the distant places however; Kasganj District does not have any such facility of its own. Ministry of Environment, Forests & Climate Change (MoEFCC), Govt. of India has notified the Bio-Medical Waste (Management & Handling) Rules, 1998 as amended Rule 2018. In accordance to the rule, every occupier of a Health Care Establishment (HCE) shall either set up requisite bio-medical waste treatment facilities on site or ensure requisite treatment of the bio-medical waste at an approved Common Biomedical Waste Treatment Facility. No untreated bio-medical waste shall be kept stored beyond a period of 48 hours.

As per the guideline of CPCB, one CBWTF facility will cover 75 km area and 10000 beds. Nearby CBMWTF are Mathura, Agra, Shajahanpur and Mainpuri each Facility is at distance 92KM, 92KM, and 89KM respectively from project site.

TABLE 1.4 CURRENT SCENARIO OF AVAILABLE CBMWTF IN NEARBY DISTRICT

S. No	Name of CBWTF	Address	Covering District and Total Beds		Radius	Total Treatment Capacity
1	Bio Medical Waste Disposal Agency	Khasra No 622, Rava-Neem – Gaon Road, Village Pandwa, Mantt, District Mathura	Mathura Aligarh Kashganj Eta Firozabad Sambhal Hathras TOTAL	4633 6737 905 697 2251 1306 1488 18017	92 Km	Incinerator-200kg/hr, Autoclave-50Kg/shift, Shredder-100Kg/hr
2	Dutt Enterprises Ltd	Khasra No.670, Mauja-Darhera, Tehsil-Atmadpur, Agra	Agra Mainpuri Firozabad Hathras Bhind & Morena TOTAL	8708 889 - - 1904 11501	92 Km	Incinerator-200kg/hr, Autoclave-50Kg/shift, Shredder-100Kg/hr
3	SP Green Light Environment Waste Management LLP	Saampur Nava diya Meeranpur Katra, Tilhar Shajahanpur	Bareilly Pilibheet Moradabad Rampur Amroha J.P.Nagar Shajahanpur Badaun TOTAL	9726 1190 4939 1720 1991 - 2443 1759 23768	104 Km	Incinerator-150kg/hr, Autoclave-430ltr/shift, Shredder-50Kg/hr

Source: UPPCB Report on BMW status as on 20.01.2020

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All the three Plants adjoining/ surrounding/ nearby the proposed plants are operating/ covering more than 10,000 beds (against the prescribed limit under the Rules) in the coverage area and the existing treatment capacity is not adequate and proper for the CBWTF. In fact, the total number of beds covered by these three units together is 53,286 which is far beyond the permissible capacity of 30,000 (i.e.10,000 each).

The above figures are from the UP Pollution Control Board, which was submitted by the UPPCB to the Oversight Committee, NGT, U.P., Lucknow, vide order dated 20.07.2020, before the Hon'ble NGT in the O.A. 710 of 2017 (Shailesh Singh vs. Sheela Hospital & Trauma Centre, Shahjahanpur & Ors.) connected with O.A.'s 711, 712 & 713 of 2017 is attached as an Annexure- IV.

However, the proposed project is aimed to cater approx. 10,000 beds and will cover 75 km or more if required as per authority requirements.

It is pertinent to mention here that in the said report, it is categorically mentioned that the above figures of number of 53,286 in the particular areas are excluding the Clinics, Laboratories, Research Institutes, Animal Houses, Ayush Hospital, Blood Banks, Pathological Labs as well as Veterinary Hospitals.

In addition to this there are number of HCF's which are not authorised and also there are many proposed HCF's which have applied for authorisation and will be operational very soon. Therefore, 3 CBWTF are covering in excess of 53,286 beds as there are number of beds which are not accounted for but had a clear mention in the UP PCB report submitted to Oversight Committee in compliance of the order dated 20th July, 2020 passed by Hon'ble NGT in O.A. No.710 of 2017 (connected with O.A.'s 711,712 & 713 of 2017). There is enough demand and supply gap as per the authenticated government department records and an emergent need for one more CBWTF to be permitted for operation in the area.

In view of above M/s Indo Tech Waste Solution is proposing for Common Bio-medical Waste Management Facility at At Village –Kumraua, Block- Soron, Tehsi & District- Kasganj, U.P. and has applied for the grant of Environment Clearance. Also, a NOC from CMO, Kasganj obtained on 27.12.2021 for the requirement of Common Biomedical Waste Treatment Facility at the Kasganj district (annexure - VII) and an application was submitted to UPPCB for NOC for proposed project vide letter dated; 11.10.2021 (annexure – VIII). However, to comply with the conditions we submitted our application for NOC which was turned down by the UPPCB and we were advised to apply only after grant of Environment Clearance. As per MoEF&CC O.M. – F.No. IA3-22/19/2021-IA.III (E 164361), dated- 20th September 2021 CTE/CTO will be granted after Environmental Clearance.

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1.5 Scope of the Study, Details of the Regulatory as per Terms of Reference:-

The scope of the study is to carry out the Environmental Impact Assessment (EIA) studies to identify, predict and evaluate potential environmental and socio-economic impacts which may result from the proposed Common Bio-Medical Waste Management Facility and to develop suitable Environment Management Plan (EMP) to mitigate the undesirable effects.

The Study is aimed at:

- Establishing the existing environmental conditions, identifying potential environmental impacts and identifying areas of significant environmental concerns due to the proposed project.
- Prediction of impacts on environment, socio-economic conditions of the people etc. due to the proposed project.
- Preparation of Environmental Management Plan (EMP).
- Development of post project environmental monitoring program.

The EIA study shall be conducted as per the applicable rules/guidelines of Ministry of Environment and Forests, Govt. of India including general/sectoral provisions. The EIA study will necessarily include but not get restricted to the following:

- a) Literature Review
- b) Field Studies
- c) Impact assessment and preparation of the EIA/EMP

Stage A

Establishing the relevant features of the project that are likely to have an impact on the environment during construction and operation phases.

Stage B

Assessment of likely emissions from the proposed facility. Assessment of impacts using scientific tools to delineate post project scenario.

Stage C

Suggesting adequate pollution control measures to offset adverse impacts if any. Preparation of the EIA and EMP document. Defense of the study findings before the regulatory authorities.

An outline of the activities carried out in stages A, B, C are briefly described below.

Stage A

The study area shall be up to 10 km radial distance from the proposed project with reference to air, water, soil, noise, socio economic and ecological studies. The baseline environmental conditions shall

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be established using topo sheets, through literature survey and field investigations. In addition to the above, information on the location of towns/cities, national parks, wildlife sanctuaries and ecologically sensitive areas like tropical forests, important lakes, bio-sphere reserves and sanctuaries within impact area shall be furnished.

A review and analysis of the information available with various governmental, educational and other institutions shall be carried out for each discipline. Based upon preliminary review of the available data, detailed field work shall be planned to collect information on the parameters critical to characterize the environment of the area. The baseline environmental studies shall be undertaken for Meteorology, Air quality, Noise, Water Quality, Water Use, various aspects to be covered under different disciplines is as follows.

1) Meteorology

Following meteorological parameters of the area shall be measured at the project site. In addition, data shall be collected from the nearest IMD observatory also for reference.

- Temperature
- Rainfall
- Relative humidity
- Wind speed and direction

2) Air Quality

Ambient Air Quality shall be monitored at requisite number of locations considering the prevailing meteorological conditions, topography, nearby villages etc. The parameters for monitoring shall be PM₁₀ and PM_{2.5}, SO₂, NO_x, CO, NH₃, O₃, CH₄, H₂S, Lead, Nickel, Arsenic, Benzene & Benzo (a) Pyrene. Adequacy of the existing air pollution control measures shall be studied.

3) Noise

Noise monitoring survey shall be carried out to characterize the noise environment in the study area. The noise level shall be measured using high level precision sound level meter at suggested number of locations.

4) Water

Surface water samples and ground water samples within study area shall be collected and analyzed for physico - chemical analysis covering major, minor ions, some important heavy metals.

5) Land Environment

Soil samples were collected from the plant site, not only at its immediate vicinity but also in the surrounding villages in a 10 km radial zone. Physico-chemical properties of the soils were determined.

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Information on land use pattern in the study area was also collected. Information regarding existing cropping pattern, their types and yield of the crop was collected from various sources. Based on the attenuation factors for dust aerosols and air pollutants, green belt species have been identified.

6) Eco System

Information on eco-system within 10 km radius was collected from the state Agricultural and Forest departments. The important flora species native to the area is enumerated. A test check survey was also under taken to judge the correctness of the data collected.

7) Socio Economic Environment

A field survey was conducted within 10 km radius of the proposed project. The parameters selected under socio-economic component were demographic structure of the study area, provision of basic amenities, industries likely to come up in the study area, welfare facilities proposed by the project proponent, safety training and management, community and occupational health hazards. Relevant information was collected from selected villages and analyzed.

Stage B Assessment of Environmental Impacts of Proposed Project

With the knowledge of baseline conditions in the study area and proposed project activities, impact on the environment shall be discussed in detail covering air emissions, discharge of liquid effluents and particulates emission during construction, noise & solid waste generation etc. Detailed projections shall be made to reflect influence of the proposed project on different environmental components.

Assessment of potential damage to terrestrial and aquatic flora and fauna due to air emissions, discharge of effluents, noise pollution, ash disposal, and change in land use pattern, habitat degradation and fragmentation, anthropogenic activities from the proposed project a delineation of guidelines to minimize adverse impacts is to be done. Assessment of economic benefits arising out of the project shall be done.

Stage C Environmental Management Plan

At this stage, it may become apparent that certain mitigation measures are necessary to offset the impacts from the proposed project. Environmental management plan and pollution control measures shall be necessary to meet the requirements of the regulatory agencies.

Environmental Management Plan shall consist of mitigation measures for item-wise activity to be undertaken for construction and operation of the facility for its entire life cycle to minimize adverse environmental impacts. It shall also delineate the environmental monitoring plan for compliance of various environmental regulations.

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1.6 Report Layout

The EIA report comprises of the following sections:

- **Chapter 1 Introduction** - Purpose of the report, Identification of project & project proponent, Brief description of nature, size, location of the project and its importance to the country & region, Scope of the study.
- **Chapter 2 - Project Description** Condensed description of those aspects of the project (based on project feasibility study), likely to cause environmental effects.
- **Chapter 3 - Description of the Environment** Study area, period, components & methodology, Establishment of baseline for valued environmental components, as identified in the scope, Base maps of all environmental components.
- **Chapter 4 – Anticipated Impacts and Mitigation Measures** Details of Investigated Environmental impacts due to project location, possible accidents, project design, project construction, regular operations, final decommissioning or rehabilitation of a completed project, measures for minimizing and/or offsetting adverse impacts identified, irreversible and irretrievable commitments of environmental components, assessment of significance of impacts, mitigation measures.
- **Chapter 5 - Analysis of Alternatives (Technology & Site)** In case, the scoping exercise results in need for alternatives, description of each alternative, summary of adverse impacts of each alternative, mitigation measures proposed for each alternative and, selection of alternative.
- **Chapter 6 - Environmental Monitoring Program** Technical aspects of monitoring the effectiveness of mitigation measures
- **Chapter 7 - Additional Studies** Public consultation, risk assessment, social impact assessment, R & R action plans.
- **Chapter 8 - Project Benefits** Improvements in the physical infrastructure, improvements in the social infrastructure, employment potential – skilled; semi-skilled and unskilled other tangible benefits.
- **Chapter 9 – Cost Benefit Analysis** Details of Environmental Cost Benefit Analysis, if recommended at scoping stage i. ToR
- **Chapter 10 - Environmental Management Plan** Description of the administrative aspects, ensuring that mitigation measures are implemented and their effectiveness monitored, after approval of the EIA.
- **Chapter 11 - Summary & Conclusion** Overall justification for implementation of the project, explanation of how, adverse effects have been mitigated.

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- **Chapter 12 - Disclosure of Consultants** Details of consultants involved in the proposed project.

1.7 Scope of EIA Study

The Scope of the study is to carry out the Environmental Impact Assessment (EIA) studies to identify, predict and evaluate potential environmental and socio-economic impacts which may result from the proposed Common Bio-medical Waste Treatment Facility (CBWTF) and to develop suitable Environment Management Plan (EMP) to mitigate the undesirable effects.

Secondary Data Collection:

Collection of secondary data comprising of information on project conception, planning and development, land details, physical, biological, geological and land use information of the project area, socioeconomic data.

Investigations and surveys:

Environmental investigations and laboratory testing for samples (Air, Water, and Noise and Soil quality) and analysis of meteorological, Ecological and social surveys were also conducted in the immediate surrounding area.

Legal framework, statutory requirements and international guidelines:

As per EIA Notification S.O. No 1533 dated 14th Sep 2006 and its subsequent amendments the proposed project is falling under Project / Activity 7 (da) Common Bio-medical Waste Treatment Facility (CBMWTF) under Category 'B', and thus, being appraised by the State Level Expert Appraisal Committee (SEAC) Lucknow, Uttar Pradesh.

Public consultations and disclosure:

Public Hearing for the proposed project was conducted on 06.06.2022 (12:30 PM) at "Collectorate Office, Kasganj, Uttar Pradesh in accordance with the EIA notification 2006 & SPCB and its proceedings are incorporated in Final EIA/EMP report.

The Public Hearing is organised by Uttar Pradesh Pollution Control Board and Presided by District Magistrate, Kasganj, Uttar Pradesh.

Impact Assessment:

Assessment of the potential impacts with respect to environmental and social aspects has been carried out and their significance determined.

Environmental Management Plan (EMP) along with Monitoring Plan:

Appropriate mitigation and monitoring measures are suggested to minimize any potential damaging effects or any lasting negative consequence.

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1.8 Legal Framework, Statutory Requirements and Guidelines.

TABLE 1.5 LEGAL FRAMEWORK, STATUTORY REQUIREMENTS AND GUIDELINES

Sr. No.	Applicable Rules & Regulations for proposed project	Responsible Agencies
1	The Environment (Protection) Act 1986, as amended in April 2003; EPA Rules 1986, as amended in 2002.	UPPCB/CPCB MoEF&CC
	EIA Notification 2006, and its subsequent amendments	MoEF&CC /SEIAA
2	The Water (Prevention and Control of Pollution) Act, 1974, amended in 1988	UPPCB/CPCB
3	The Air (Prevention and Control of Pollution) Act, 1981, amended in 1987.	UPPCB/CPCB
4	The Water (Prevention and Control of Pollution), Cess Act, 1977 including Rules 1978 and 1991	UPPCB/CPCB
5	The Noise (Regulation & Control) Rules, 2000 as amended in October 2002	UPPCB/CPCB
6	Hazardous Wastes (Management Handling and Trans boundary Movement) Rules, 2008 as amended up to 2016	UPPCB/CPCB
7	Bio-medical Waste Management Rules 2016 and its subsequent amendments	UPPCB/CPCB
8	Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of COVID-19 Patients Dt; 17 th July 2020 – Rev. 4	UPPCB/CPCB
9	Construction and Demolition Waste Management Rules, 2016	UPPCB/CPCB
11	Central Ground Water Authority Notification The Central Ground Water Authority (CGWA) has notified 43 areas for control and regulation of groundwater. If required	UPPCB/CPCB
14	National Environmental Policy 2006	UPPCB/CPCB/MoEFCC

Note: The study area shall comprise of radial distance of 10km from the projects site and the study period is three months. The impact on each of the above parameter as a result of proposed project site shall be assessed through appropriate modeling and prediction methods considering base line data.

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CHAPTER-II

PROJECT DESCRIPTION

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CHAPTER – II

Project Description

2.1 Type of Project

The Proposed Project is a Development of Common Bio-medical Waste Treatment Facility at Kumraua Village, Kasganj Tehsil & District, Uttar Pradesh.

Ministry of Environment, Forest & Climate Change (MoEF&CC) notified amendment to the EIA Notification 2006 published vide MoEF&CC Notification of S.O. 1142 (E) dated April 17, 2015. According to this notification, the Bio-medical waste treatment facility is categorized under the item 7 (da) in the schedule, requiring 'environmental clearance' from the State Environment Impact Assessment Authority (SEIAA) / State Expert Appraisal Committee (SEAC). The SEIAA has grant ToR vide its letter No.- 93/Parya/SEIAA/6191/2021, dated- 11th June 2021. Annxure – I.

The Salient features of the project are given in **Table 2.1** below.

TABLE-2.1 SALIENT FEATURES OF THE PROJECT

Sl.no	Parameters	Description									
1	Total Area	4081 Sqm (0.408 ha)									
2	Category of Project	7 (da) Common Biomedical Waste Treatment Facilities (CBWTF).									
3	Proposed capacity of plant & equipments.	The proposed project having capacity to cater around 10,000 beds with a treatment capacity of 7.2 Tonne/day. At present the project is to cater a waste quantity of around 10,000 beds from surrounding hospitals, as per UPPCB Report 2020 as annxure – IV. The proposed treatment facilities at the site are: Autoclaving- 250 kg/batch Shredding – 150 kg/hrs Incineration- 200 kg/hrs Effluent Treatment Plant- 5 KLD									
4	Plot no./Khasra no.	Plot No. 1161									
5	Location	Kumraua Village, Soron Block, Kasganj Tehsil & District, Uttar Pradesh. <table border="1"> <tr> <th>Sr. No.</th><th>Latitude</th><th>Longitude</th></tr> <tr> <td>A</td><td>27°57'28.14"</td><td>78°36'34.74"</td></tr> <tr> <td>B</td><td>27°57'29.41"</td><td>78°36'37.18"</td></tr> </table>	Sr. No.	Latitude	Longitude	A	27°57'28.14"	78°36'34.74"	B	27°57'29.41"	78°36'37.18"
Sr. No.	Latitude	Longitude									
A	27°57'28.14"	78°36'34.74"									
B	27°57'29.41"	78°36'37.18"									

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		C	27°57'30.85"	78°36'36.09"
		D	27°57'29.53"	78°36'33.70"
6	Elevation	176-177 meters above MSL.		
7	Water requirement	Water requirement for the proposed CBWTF project is approx. 5 KLD. Source : Bore Well & External Water Tankers.		
8	Power	62 KW, Source- Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL). DG set (62.5 KVA) is proposed for power backup.		
9	Coverage Area	Aligarh, Hathras, Etah, Kanshi Ramnagar, Sambhal, Budaun		
10	Total Project Cost	Project cost is Rs. 172 Lakhs (1.72/- Crore).		

2.2 Need for the Project

To enable effective management and handling of the biomedical wastes, the Ministry of Environment and Forests & Climate Change (MoEF&CC) has issued formulated rules known as the “Biomedical Wastes Management Rules 2016”, and its subsequent amendments, under the aegis of Environment (Protection) Act, 1986 and its subsequent amendments.

In response to these rules, Government and Private Hospitals initiated their arrangements for treatment and disposal of biomedical wastes. However, the smaller nursing homes, clinics and other similar institutions which do not have or cannot afford such facilities need alternate modalities and arrangements to dispose their wastes, in accordance with the Rules.

In view of the difficulties faced by private hospitals, nursing homes and clinics that could not make their own arrangements due to high cost involved in setting up treatment and disposal facilities, the need for a centralized system for treatment was felt. Bio-medical Waste management Rules, 2016 and its subsequent amendments discouraged the setup of individual incineration facilities by health care establishments.

2.3 Justification of the Project

Based on the inventory as per UP Pollution Control Board report submitted to the Oversight Committee, NGT, U.P., Lucknow, vide order dated- 20.07.2020, before the Hon’ble NGT in the O.A. 710 of 2017 (Shailesh Singh vs Sheela Hospital & Trauma Centre, Shahjahanpur & Ors.) connected with O.A.’s 711, 712 & 713 of 2017. All three plants (Mathura, Agra & Shajahanpur) adjoining/surrounding/nearby the proposed plant are operation/covering more than 10,000 beds (against the prescribed limit under the Rules) in the coverage area and the existing treatment capacity is not adequate and proper for the CBWTF. In fact, the total number of beds covered by

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these three units together is 53,286 which are far beyond the permissible capacity of 30,000 (i.e. 10,000 each). Copy of report is attached as annexure – IV.

Now, M/s Indo Tech Waste Solution has proposed to develop Common Bio-medical Waste Treatment Facility (CBWTF) in Kasganj District to cater the waste & treat them from government and private HCF's of Kasganj & near by districts with a coverage area of 75Km or more if required.

2.4 Project Location, Boundary and Project Layout

The proposed Common Bio-Medical Waste Treatment Facility will be established in an area of (4081 Sq. m.) located at Khasra No. 1161, Village-Kumroua, Block- Saron, Tehsil & District- Kasganj Uttar Pradesh. The Proposed Land is taken on lease by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution for 15 years. M/s Indo Tech Waste Solution has applied for conversion for land use via Revenue Council, Uttar Pradesh online portal - case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amenmdment 2016) section 80 (1) on dated; 11.10.2021 is under progress and shall be obtained. Application for same has been attached as annexure – V.

The Google image of the proposed site is given in **Figure 2.1 & 2.2** and topographical map of 10 km radius buffer area is shown in **Figure 2.3**. Also the layout of the facility with ancillary units and site photographs are shown in **Figure 2.4** and **Figure 2.5** respectively.

The land breakup details of the proposed facility are given in **Table 2.2**

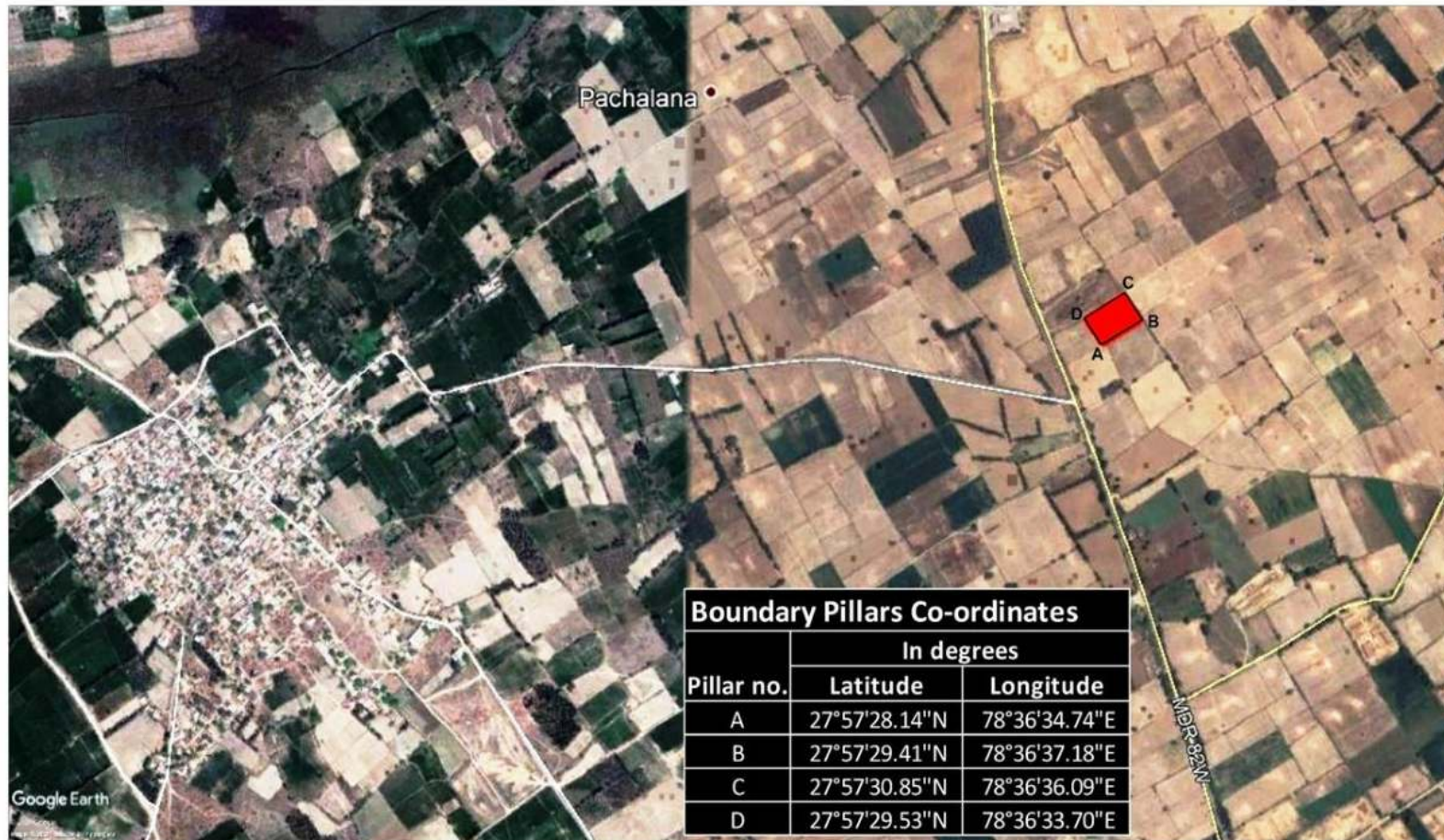
TABLE-2.2 LAND BREAKUP DETAILS

S.No	Particulars	Area in Sqm	Area in %
1	Build Up Area	831	20.37
2	Incinerator Area	334	8.18
3	E.T.P Area	25	0.62
4	Road Area	1055	25.85
5	Green Belt	1347	33
5	Open Area	489	11.98
	Total Area	4081	100.00

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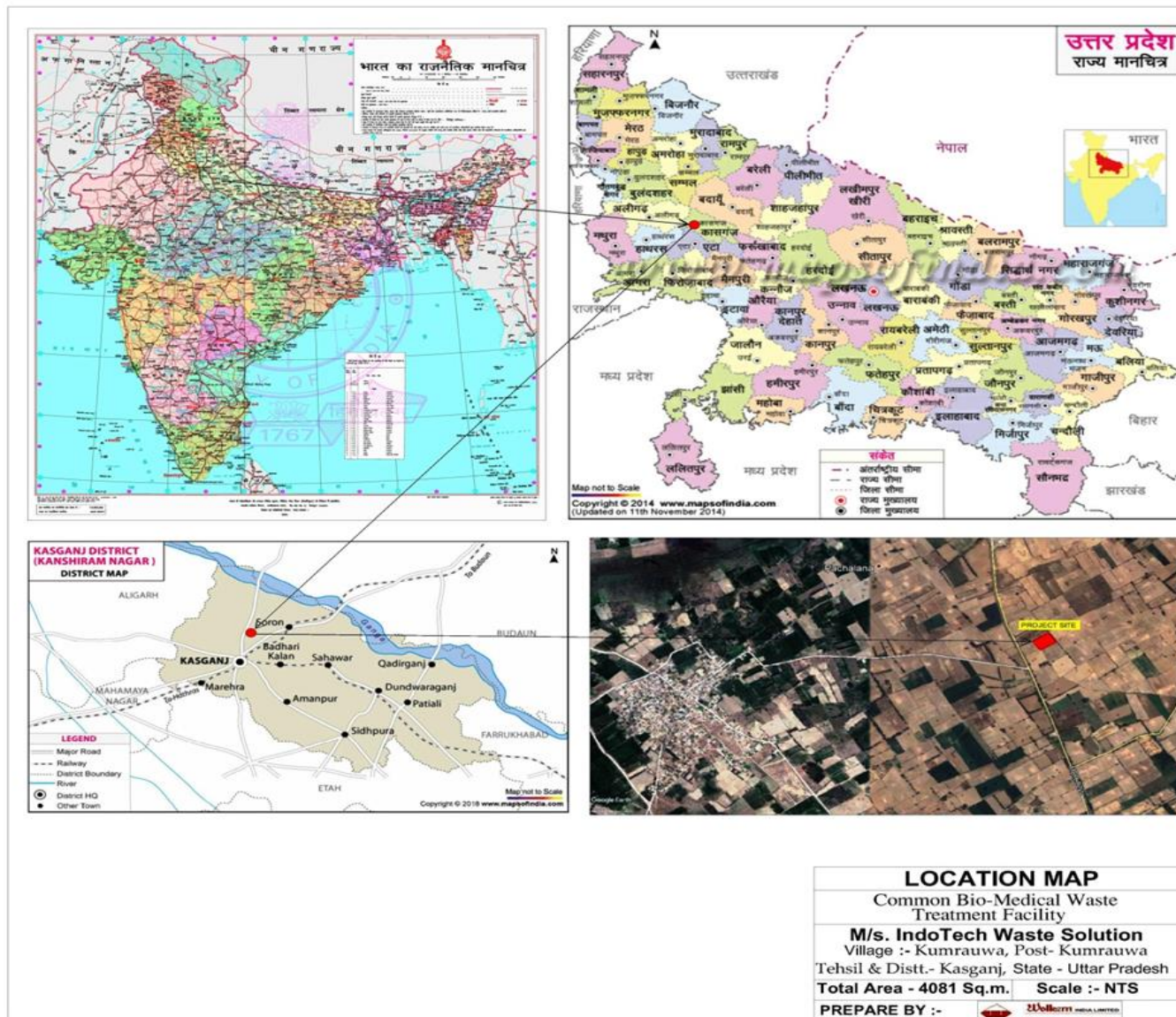
FIGURE 2.1: GOOGLE IMAGE OF THE AREA

Google Image of M/s. IndoTech Waste Solution, Village :- Kumrauwa, Post- Kumrauwa Tehsil & Distt.- Kasganj, State - Uttar Pradesh, Total Area - 4081 Sq.m.



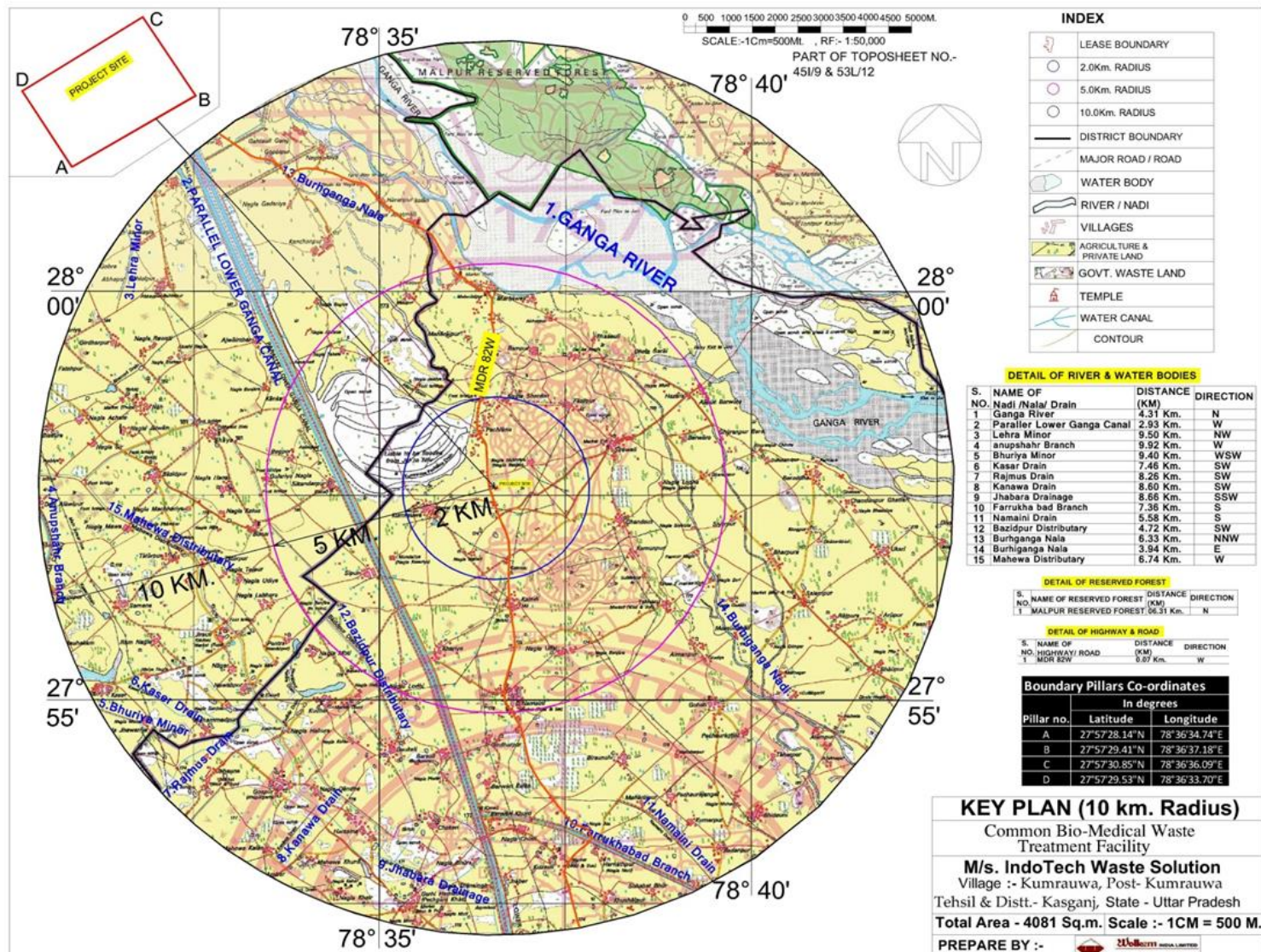
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FIGURE 2.2: LOCATION MAP



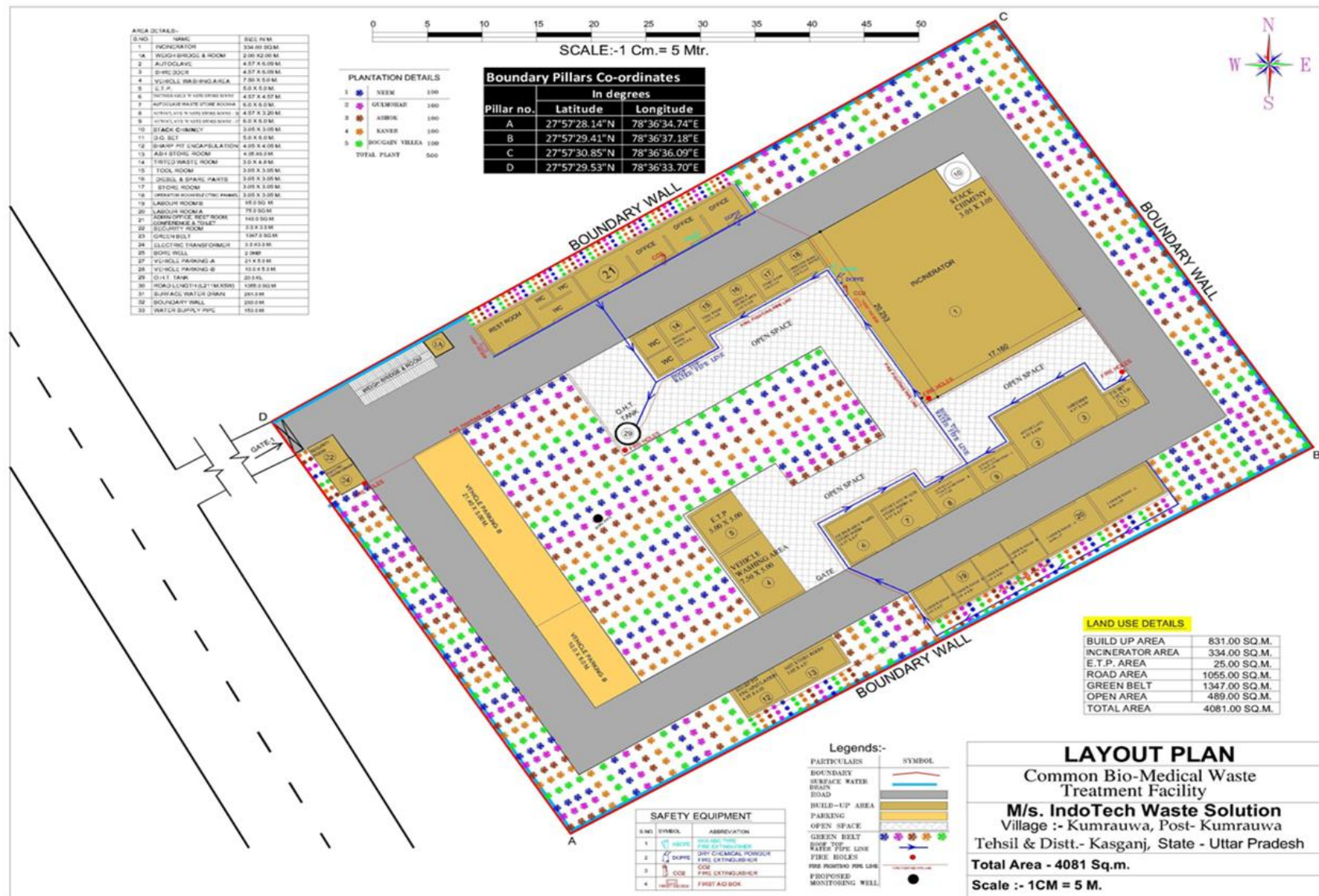
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FIGURE 2.3: KEY PLAN OF THE AREA



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FIGURE 2.4: LAYOUT OF THE FACILITY



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FIGURE 2.5: PROPOSED SITE PHOTOGRAPHS



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2.5 Size or Magnitude of Project

The proposed project shall be developed for the Common Bio-medical Waste Treatment Facility having capacity to cater around 10,000 beds with a treatment capacity of 7.2 Tonne/day and estimated total project cost is to be Rs. 1.72 Crores. The area of land is 0.408 Hectare (4081 Sq. m.) total cost of the project is estimated. The project will cater health care establishment from the district of Kasganj and neighboring districts.

Main components in the proposed CBWTF are:-

1. One Static Dry Incinerator of Capacity 200 kg/hour
2. One Horizontal Cylindrical Autoclave having a capacity of 2500 ltr/hour or 250 kg/batch
3. One Shredder having a capacity of 150 kg/hour
4. Effluent Treatment Plant having a capacity of 5 KLD.

All the components of the proposed facility are designed to comply Bio-Medical Waste Management Rules 2016 and its subsequent amendments. The components of the CBWTF are:-

- Incinerator
- Autoclave
- Shredder
- Administration Building
- Air Pollution Control Devices
- Waste Storage Room
- Ash Storage Area
- Vehicle washing bay
- Effluent Treatment Plant
- Greenbelt
- Treatment Equipment Room
- Security office
- Fire Safety
- First Aid Box
- DG set

2.6 Treatment Technologies

2.6.1 Static Dry Incinerator

The primary purpose of incineration is to burn the waste to ashes through a combustion process. The unit shall be a dual chambered incinerator.

The Incineration defined as thermal destruction of Bio-Medical Waste at elevated temperature. The temperature of the primary chamber is minimum of 800°C and the secondary chamber is minimum of 1050°C±50°C, at under controlled operational conditions. The product after combustion is oxides of carbon water and ash as residues. The unit in which the process takes place is termed as Incinerator.

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The dry technology incinerators are most advanced incinerator technology in the World. High level of automation, variable frequency drives at all critical points to ensure the finest adjustment of chemicals for injection in the system to control the pollutant gases for complying the stringent norms in the World.

Proposed Capacity of Incinerator-200kg/hr (Static Solid Health)

Dry Technology with fully automation and fitted with advanced Air pollution Control Device

• Use of high temperature filters Candles in filtration system.
• Temperature resistance in filter Candles up to 900 degree C.
• Most Effective air pollution control designed to treat the small particulate matter.
• Achieve the finest adjustment of chemicals for injection in the system to control the pollutant gases Furans & Dioxin.
• Zero discharge through incineration process.
• Operates at high temperature, thus avoids corrosion.

➤ **Constructional Features of Static Dry Incinerator**

Main Combustion Chamber/Primary Chamber

The primary chamber is fabricated out of Mild Steel and is refractory lined from inside with refractory bricks 115mm thick backed by insulation bricks 115mm thick. This is equipped with loading door, ash removal door and automatic burner operated by temperature indicating controller which is set at minimum 800°C. High pressure air from a blower is provided through a number of nozzles fitted in the walls of the primary chamber. Since refractory is very thick and air is circulated within the chamber, it ensures a very low skin temperature of the Incinerator. The primary chamber is provided with an Automatic waste feeding system. The waste is introduced on the hearth in a way so as to prevent the heap formation. Suitable raking arrangement is provided for uniform spreading of waste on the earth.

Post Combustion Chamber/Secondary Chamber

Secondary chamber is manufactured out of Mild Steel and refractory lined from inside with refractory bricks 115mm thick backed by insulation bricks 115mm thick, combustion air is added at the inlet of the secondary chamber via a series of nozzles. This is equipped with automatic burner. A temperature indicating controller is provided, which is connected to the control panel. The operating temperature is 1050±50°C. The secondary chamber is so designed so as to ensure a minimum 2 seconds residence time to gas flow.

Gas Cooler

It is necessary to drop down flue gases temperature for the cleaning before entering filtration system. For this reason, thermal energy (heat) must be removed from the flue gases. The flue

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gases travel through Gas cooler via refractory lined duct and quickly cooled down to the filter operating temperature. The heat removed from the flue gases is transferred into atmosphere by air.

Flue Gas Neutralizing System

After the gases exit the flue gas cleaning system, they enter the Flue Gas Neutralization System. The Flue gas neutralizing System is provided to neutralize the SO₂, NO_x, and HCL present in the flue gases through alkali reagent.

Dioxin Control System

The dioxin control system is provided to take care of NO_x, Dioxin & Furans and odor present in the flue gases.

Filtration System with Pneumatic Controls (TorriTherm)

After the Flue gas neutralizing unit neutral flue gases enter the TorriTherm filtration system in which most advance technology dust collection system efficiently traps fine dust particles from flue gases before exit to chimney.

TorriTherm filtration system is based on the pulse jet principle having the capacity to remove stubborn sub-micron particles. Flue gas entering the filtration system is uniformly distributed among the chamber, the larger particles drop out into the hopper, and smaller particles are entrapped on the filtration media forming a layer or cake. Clean gas passes through the filtration media. Pulse jet cleaning begins on the filters.

The compressed air enters each row of filters intermittently from the blowpipe located above the filter house. The drop in pressure of air in the filter media creates a pressure wave, which passes through the whole length of the filter. The adherent dust is loosened by the sudden filter deformation / flexing and falls into the dust hopper.

TorriTherm filters are used for high collection efficiency, suit physical and chemical nature of the flue gases to be handled and humidity and temperature of the air. The TorriTherm filter House is provided with rotary locks at the bottom for continuous dust removal of dust from the flue gases.

I. D. Fan

The Induced Draft Fan maintains the balance draft and draws out the clean gases into the atmosphere through a 30 mtrs high stack. The I. D. Fan is dynamically balanced. The I.D. Fan is belt driven and connected to an electric motor.

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Forced Draft Fan

A forced draft fan is provided to supply air inside the primary and secondary chambers. The F.D. Fan is dynamically balanced and is connected to the electric motor.

Fuel Oil Tank & Piping

Fuel oil tank of suitable capacity fabricated out of Mild Steel is provided. The fuel tank will have all connections for supply, return, drain and visual checking of the quantity of fuel present in the tank. Complete fuel oil piping from the fuel tank to both burners is provided along with the return line.

Burners

Fully automatic burners complete with ignition transformer, ignition electrodes, necessary fuel lines, photocell, blower, fuel pump and fuel oil nozzles are provided for primary and secondary chambers

Electrical Control Panel

The control panel supplied with the Incinerator is placed separately. It consists of PLC along with display unit. The display unit automatically and continuously monitors and record dates, time of day, batch sequential number and operating parameters such as temperatures in both the chambers.

Chimney of 30 Meters high from ground level

Chimney of 30 mtrs height is provided complete with ladder, inspection platform, stack drain, aviation light and other accessories. Chimney is provided for release the clean gases in the atmosphere.

TABLE-2.3 EMISSION STANDARDS

S.N.	Parameter	Standards	
		Limiting concentration in mg/Nm ³ unless stated	Sampling Duration in minutes, unless stated
1.	Particulate matter	50	30 or 1Nm ³ of sample volume, whichever is more.
2.	Nitrogen Oxides NO and NO ₂ expressed as NO ₂	400	30 for online sampling or grab sample
3.	HCl	50	30 or 1Nm ³ of sample volume, whichever is more.
4.	Total Dioxins and Furans	0.1ngTEQ/Nm ³ (at 11% O ₂)	8 hours or 5Nm ³ of sample volume, whichever is more.

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S.N.	Parameter	Standards	
		Limiting concentration in mg/Nm ³ unless stated	Sampling Duration in minutes, unless stated
5.	Hg and its compounds	0.05	2 hours or 1Nm ³ of sample volume, whichever is more.

FIGURE 2.6 – STATIC DRY INCINERATOR

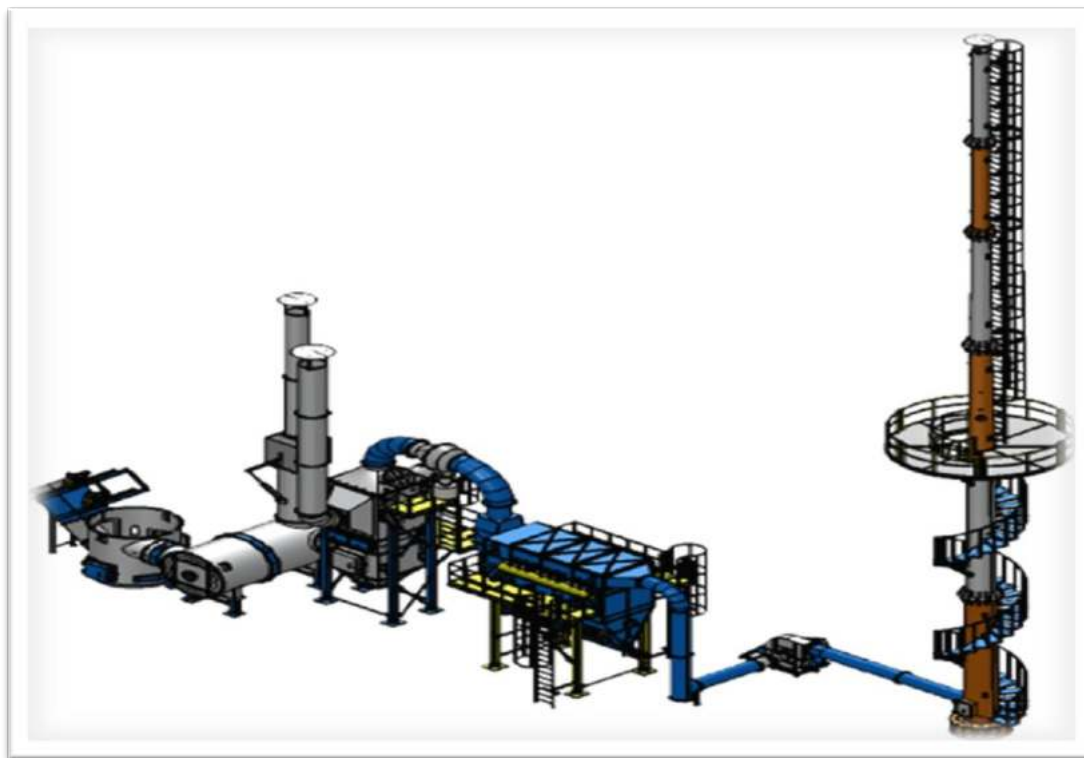
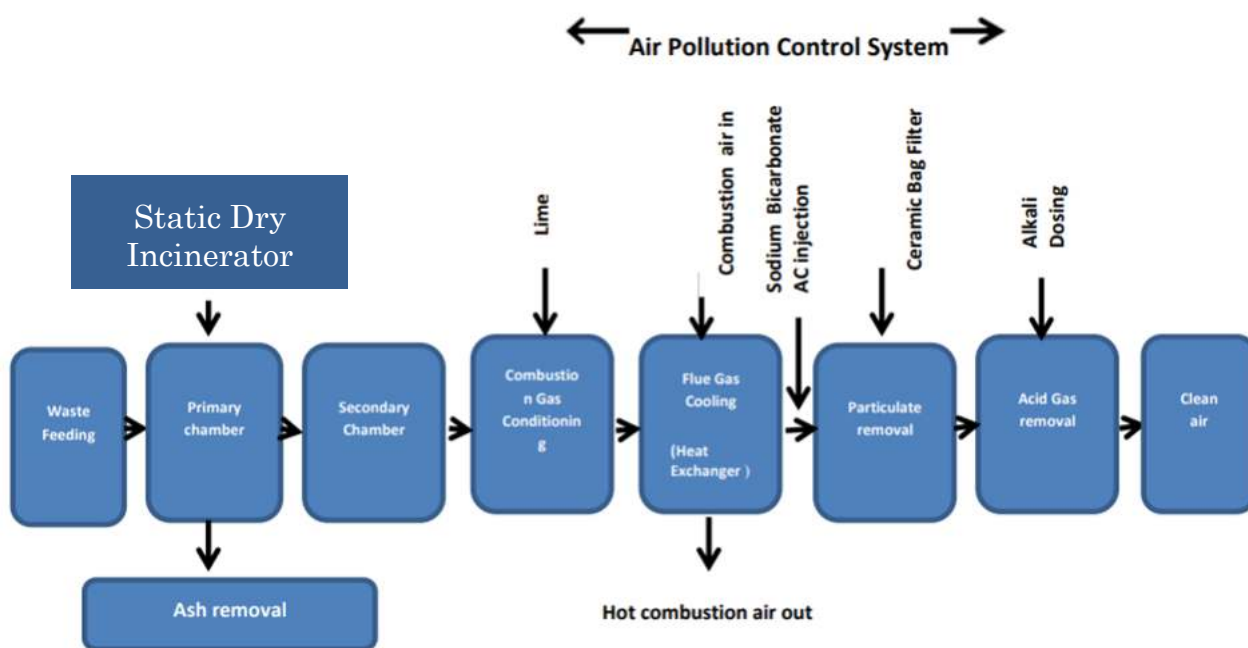


FIGURE 2.7 – AIR POLLUTION CONTROL DEVICE (DRY SCRUBBING)



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2.6.2 Horizontal Cylindrical Autoclave

The primary purpose of autoclave is to sterilize/disinfect the waste with steam. An autoclave is a specialized piece of equipment designed to deliver 135°C temperature under 31 psi pressures to a chamber, with the goal of decontaminating or sterilizing the contents of the chamber. Decontamination is the reduction of contamination to a level where it is no longer a hazard to people or the environment. EWC intends to establish an autoclave with above principle. To ensure safety and quality control, all bio-hazardous materials and items contaminated with potentially infectious agents should be decontaminated before use or disposal. Such items include, but are not limited to: culture media, surgical instruments, laboratory equipment, glassware, and biomedical waste including sharps.

Autoclave Features

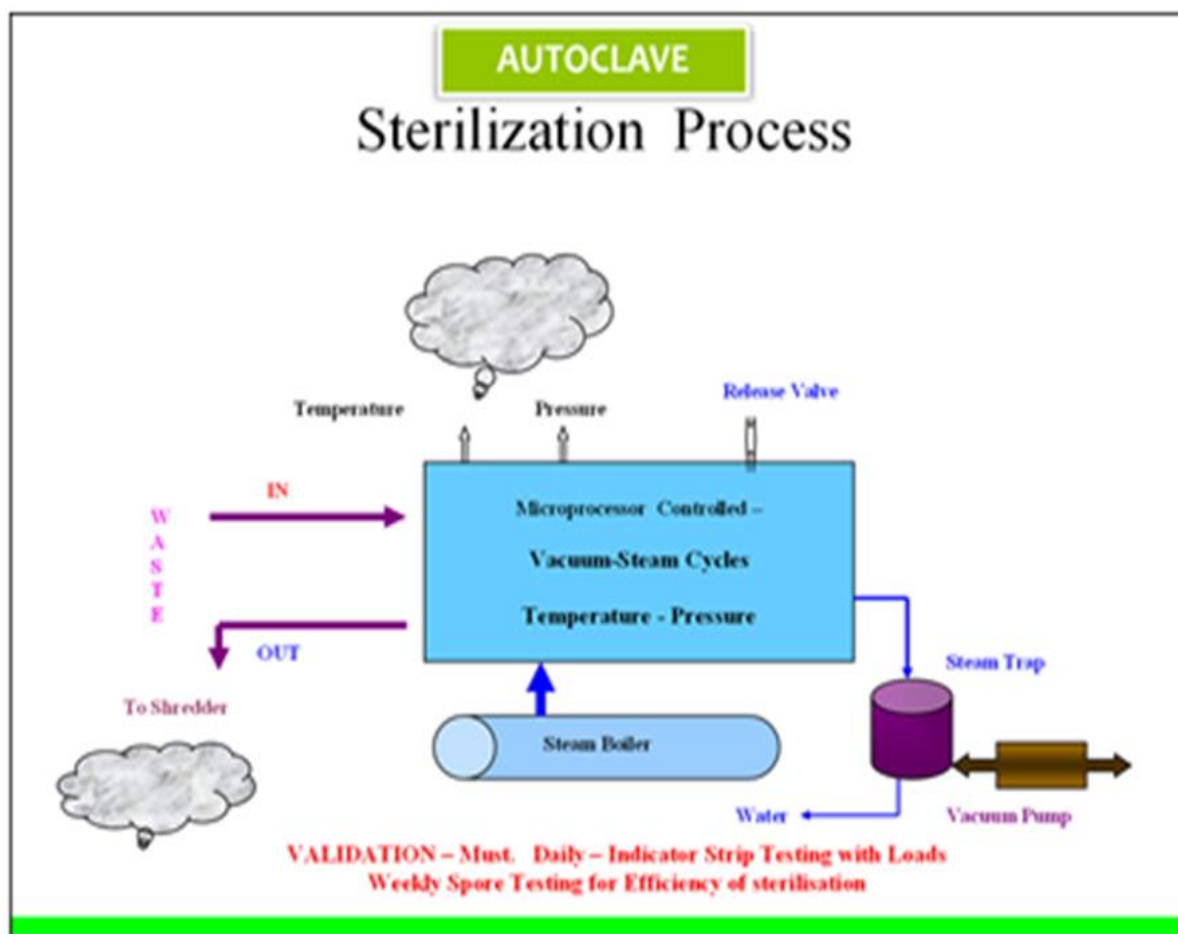
A vacuum type (programmable) autoclave which can operate at all the specifications mentioned by MoEF&CC with a capacity of 2500 litres/hrs or 250 kg/batch is proposed. The autoclave shall have continuous and automatic recording of temperature, pressure, date, time and batch of loading. Every batch shall be monitored with a strip chart recorder and once in a month the spore validation test and/or spore monitoring shall be done.

**TABLE-2.4 TECHNICAL SPECIFICATION FOR HORIZONTAL CYLINDRICAL AUTOCLAVE CAPACITY
250KG/BATCH**

Name of Equipment	Autoclave
Model	AR BMW-2500
Capacity of Autoclave	2500ltr/hrs or 250kg/batch
Type	Horizontal
Waste Material	Bio Medical Waste
Chamber	
MOC / Thickness	Stainless Steel 316 L/5mm
Size	1200 W x 1200 H x 1800D mm
Operating Pressure	2.2kg/cm ²
Working Pressure	3.2kg/cm ²
Hydro Test Pressure	120-150 Degree C
Vacuum Breaker	Fitter to Jacket to prevent possible buckling of jacket
VACUUM Pump	
Type	Water Based
Motor	5HP 2280 RPM
Steam Condenser	MOC-SS. 304 will be fitted in the vacuum line to condense the steam before entering inside the vacuum pump
Steam Generator	
Material Handling	
Carriage	MOCSS 316L

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FIGURE 2.8 – HORIZONTAL CYLINDRICAL AUTOCLAVE & STERILIZATION PROCESS



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2.6.3 Shredder

Proposed Capacity of Shredder- 150 kg/hr

The autoclaved bio medical waste plastic is shredded to pieces before being disposed-off. It is used to destroy waste to prevent their reuse. Shredding is a process by which waste are de-corrosive sharp blades capable for shredding of plastic waste, sharps, bottles, needles, tubing's, shaped or cut into smaller pieces so as to make the waste unrecognizable. Shredder has non- and other waste. The low speed two shaft systems are effective for shredding hard and solid waste.

Shredder to use for shredding bio – medical waste shall confirm following requirement:

- 1) The shredder for bio –medical waste shall be of robust design with minimum maintenance requirement.
- 2) The shredder should be properly designed and covered to avoid spillage and dust generation. It should be designed such that it has minimum handling.
- 3) The hopper and cutting chamber of the shredder should be designed to accommodate the waste bag full of bio medical waste.
- 4) The shredder blade shall be highly resistant and should be able to shred waste sharp syringe, scalpels, glass vials, blade, plastics catheters, broken ampoules, intravenous sets, bottles, blood bags, gloves, bandages etc. It should be able to handle/ shred wet waste, especially after autoclave.
- 5) Shredder blade shall be non - corrosive and hardness steel.
- 6) Shredder should be designed and mounted so as not to generate high noise & vibration
- 7) If hopper lid or door of collection box is opened, the shredder should stop automatically for safety of operator.
- 8) In case of shock-loading (non- shred able material in the hopper) there should be mechanism to automatically stop the shredder to avoid any emergency/ accident.
- 9) The motor shall be connected to the shredder shaft through a gear mechanism, to ensure low RPM and safety.
- 10) The shredder should have low rotational speed (maximum 50 rpm). This will ensure better gripping and cutting of the bio- medical waste.
- 11) The discharge height (from discharge point to ground level) shall be sufficient (minimum 3 feet to accommodate the containers for collection of shredded material. This would spillage of shredded material.

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Sharp Pit/ Encapsulation:

Encapsulation is the best method for safe disposal of sharps, Needles will be mixed with cement and aggregate to make homogeneous mix to concrete blocks of higher strength. MS frames will be provided to make these blocks for smooth outer finish.

Power Requirement

The power requirement for the process of Autoclave, Incinerator and shredder will be 63 KW will be supply from Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL), which will include the misc. plant operation load. To provide backup a DG set of 62.5 KVA will be provided

Vehicles:	10 Nos. as per requirement
Safety gadgets:	Gloves, Mask, Apron, Gumboots & Immunisation

Details of Raw Material

1. Plastic Containers:	As per requirement
2. Plastic Bags:	As per requirement
3. Diesel:	90ltrs. /hour
4. Spares:	As per requirement of Plant and machinery
5. Chemicals:	Sodium Hypochlorite, Caustic Soda, Quick Lime etc.
6. Safety Gadget:	Gloves, apron, mask, boots & Immunization

Operational Methodology

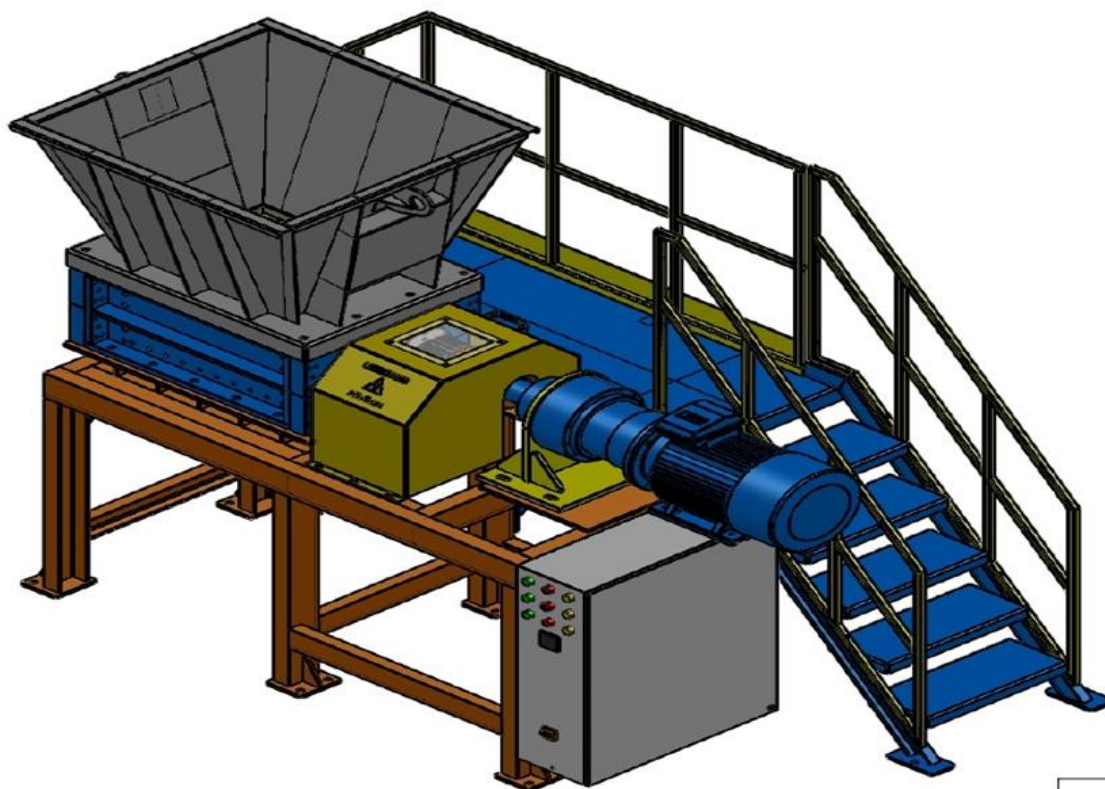
The Bio-Medical Waste generated in the health care units has to follow a specified path from source of its generation to its final disposal at the facility in accordance with the Bio-Medical Waste (Management & Handling) Rules, 2016 and standards prescribed by the Pollution Control Authorities. The process of BMW Management involves:

- Collection of segregated waste from health care establishments,
- Transportation in specially designed closed vehicles from the Health Care Unit to the CBWTF,
- Treatment of BMW by incineration or autoclaving at CBWTF,
- Shredding of treated waste & its disposal.

The responsibility of Health Care Unit for the safe disposal of Bio-Medical Waste ends once the segregated BMW is handed over to the operator of CBWTF.

The hospital waste consists 50-55% of incinerable waste and 35%-40% autoclavable waste and sharp waste 3 to 5%. Therefore, it is necessary that hospital waste is properly handled, segregated and stored by trained staff of health care establishments. The clients shall be advised to keep four containers as per BMW Rules.

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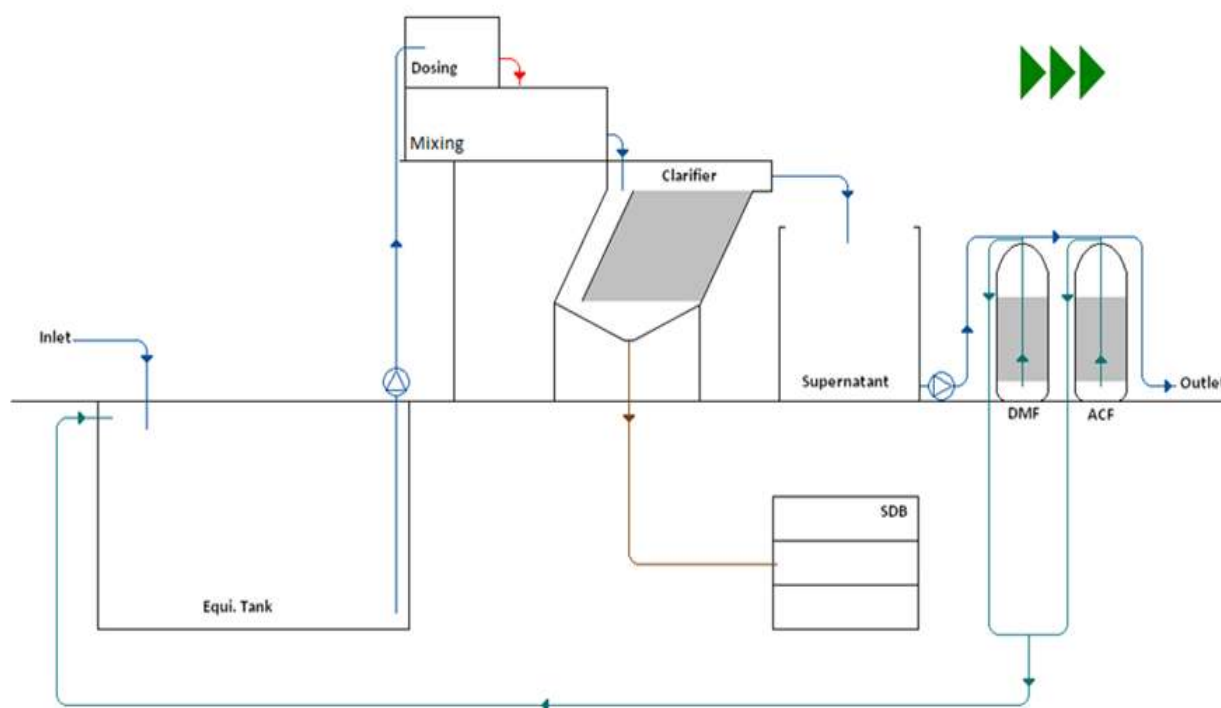
FIGURE 2.9 - SHREDDER

2.6.4 Effluent Treatment Plant

Proposed Capacity of ETP- 5 KLD with Chemical Treatment System

The wastewater passes through the oil and grease tank to remove excess oil from the wastewater. The waste water after removal of oil and grease will collected in equalization tank to holding the waste water for some pre-determined time in a continuously mixed basin to produce uniform waste water. The wastewater then subjected to Flocculation tank. In a flocculation tank, the water is stirred or otherwise moved around so that the particles move around, bump into other particles. Chemicals (most commonly "alum"/ polyelectrolyte) are often added to the water going into a flocculation tank to help aid particle formation. The next step in the process is to separate the solid sludge with the wastewater hence the wastewater will be transfer to Tube settlers which capture the settle able fine floc that escapes the clarification zone beneath the tube settlers and allows the larger floc to travel to the tank bottom in a more settle able form. The tube settler's channel collects solids into a compact mass which promotes the solids to slide down the tube channel to sludge drying beds and the water content will be goes into the carbon filter to remove contaminants and impurities, utilizing chemical adsorption. Finally, the water will be supplies to the Multistage Evaporator to evaporate the wastewater.

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FIGURE 2.10 – SCHEMATIC DIAGRAM OF ETP

2.7 Water Requirement

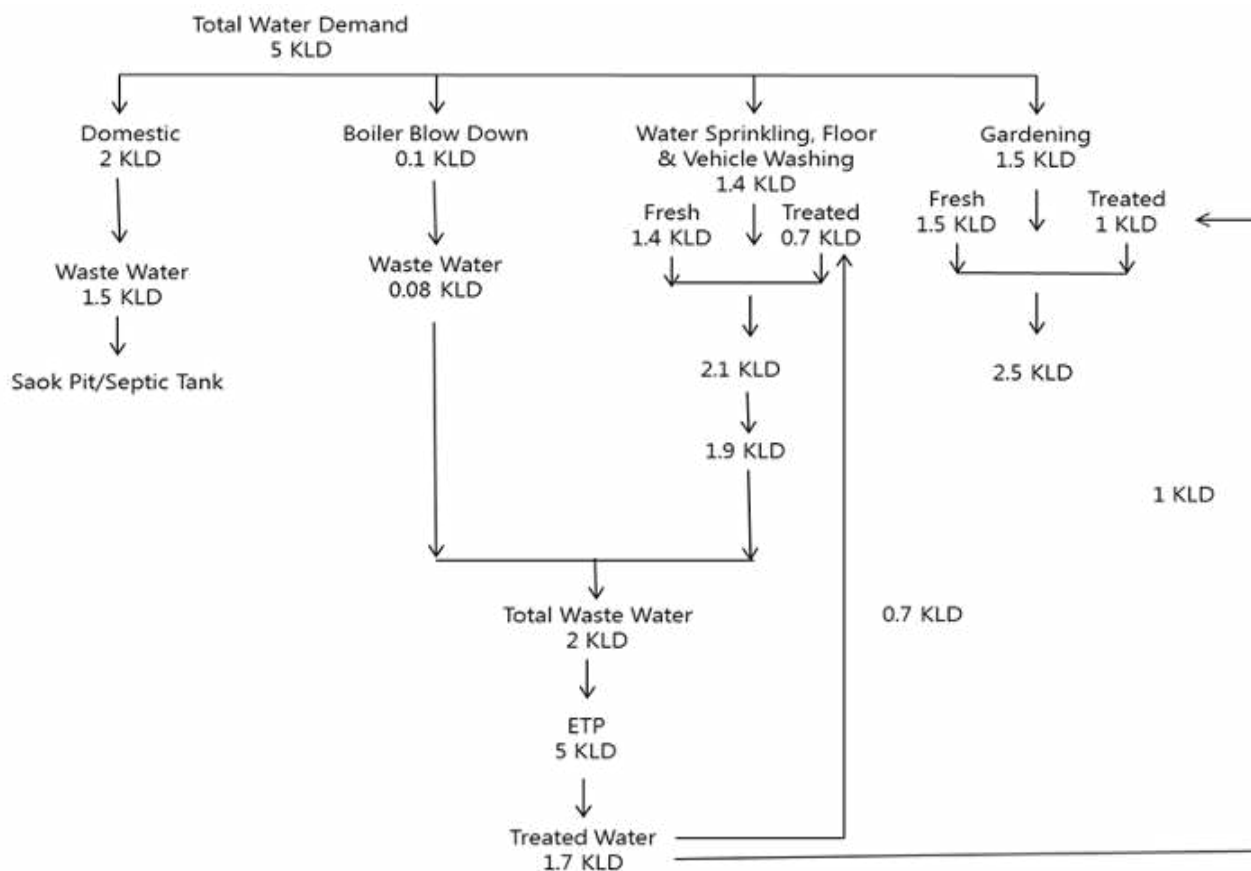
The total water requirement during construction phase will be approx.. 2 KLD and during operational phase will be approx. 5 KLD. Source- Bore Well & External Water Tankers. The amount of total wastewater generated out of proposed CBWTF is 2 KLD which shall be treated in 5 KLD ETP. Proposed project will be a Zero Liquid Discharge Unit.

Details of water consumption for the proposed activity are given in table below-

TABLE-2.5 WATER BALANCE

S. No.	Activity	Total Water	Treated Water (Requirement)	Discharge to ETP
1.	Floor, Vehicle, wheel Washing, Water Sprinkling	1.4KLD	0.7 KLD	1.9 KLD
3.	Boiler Blow down	.1 KLD	-	0.08 KLD
4.	Domestic use	2 KLD	-	Sent to Soak Pit/Septic Tank
5.	Gardening	1.5 KLD	1 KLD	-
Total		5 KLD	1.7 KLD	2 KLD

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FIGURE 2.11 – WATER BALANCE DIAGRAM

2.8 Energy and Power Requirement

Total Power requirement 62 KW will be supply from Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL) cater to the needs of the BMW facility. Sufficient capacity DG set (62.5 KVA) is proposed for power backup

2.9 Manpower Requirement

During Construction phase approx.-15 persons will be hired from nearby Villages of impact area around 10 KM preferably and in absence of such cases we hire from outside. Number of persons required in operational phase is proposed below:

TABLE-2.6 MANPOWER DETAILS

Sr. No.	Manpower/Profile No.	Number
1.	In Plant	8
2.	Administration	4
3.	Marketing	6
4.	Drivers/ Helpers/ Office	24
5.	TOTAL	42

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2.10 Bio-medical Waste Process Description

The concern about disposal of infectious wastes generated by the hospitals is increasing rapidly due to the fear of the spread of viruses such as Acquired Immune Deficiency Syndrome (AIDS) and Hepatitis B. These wastes (bio-medical wastes generated from health care establishments) present a high risk of causing potential damage to the human health and the environment by way of spreading. To prevent the spread of such infectious wastes that finds its genesis in bio-medical wastes (from hospitals, clinics, laboratories, dispensaries etc.) a scientific approach for its final disposal is required. It is essential that professionally trained personnel should handle the wastes and that the wastes should be disposed scientifically.

FIGURE 2.12 – DISPOSAL OF WASTE AS PER BMW RULES 2016



2.10.1 Waste Classification and Characterization as per BMW Rules

The classification and characterization of Bio-medical Waste shall be as per Bio-medical Waste Management Rules, 2016 and its subsequent amendments. Different categories of BMW are collected in different color coded bags.

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TABLE-2.7 WASTE GENERATION (Category Wise) PER DAY (in kg)

Waste Category	Product	Treatment	Quantity in kg/day
Red 	Recyclable waste Plastic (Tubings, Bottles, Gloves, Syringes and Vaccutainers)	Autoclaving & Recycling	Approximately 1700 Kg/day
Blue 	Broken Glasses, Medicine Vials, Metallic Body Implants, Contaminated Glass, Ampoules	Autoclaving & Recycling	Approximately 250 Kg/day
White (Translucent)	Needles, Scalpels, Syringes with fixed needles, Blades, Brunt Needles	Autoclaving & Recycling to foundries	Approximately 25 Kg/day
Yellow 	Incinerable Waste (Human Anatomical Waste, Soiled Linen & Beddings, Animal Anatomical Waste, Blood Bags, Discarded Medicine, Cytotoxic drugs, Items Contaminated with Cytotoxic Drugs,)	Incineration & Cytotoxic waste -Pre-treatment with 10% Sodium Hypochlorite Solution then Incineration	Approximately 1600 Kg/day
Hazardous Waste	Ash	TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi(VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101.	50Kg/day
	Treated water	Used within premises after proposed 5 KLD ETP treatment	1.7 KLD

2.10.2 Waste Quantities

The project is being perceived to cater to a large number of small and medium sized health care establishments in the private sector and government establishments. Out of the total quantity of waste estimated, 60-80% would be incinerable and rest would be autoclavable and shredderable. The ash from incineration would be sent to TSDF site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi (VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101.

2.10.3 Waste Audit

Indo Tech Waste Solution shall undertake a waste audit to assess the waste quantities, current waste handling practices and subsequent treatment and disposal of the wastes. The audit shall include a survey of representative health care establishments and cover all aspects related to bio-medical wastes including occupational health and safety.

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2.10.4 Training and Awareness

Our experiences indicate that, the awareness levels of most health care establishments in respect to bio-medical waste management are very low. The health care workers are not completely aware of the impacts of the improper waste handling and management. Our first step towards our endeavor would be to create awareness among all the stakeholders involved in the subject. Subsequent to this organization shall provide thorough training to all the members on all aspects of bio-medical waste Management. This training shall include segregation of wastes into proper color coded bags, identification of containers required for collecting the wastes, precautions to be taken in respect of handling wastes with special reference to sharps management. There shall be specific focus towards occupational safety of health care workers.

2.10.5 Waste Minimization

Waste minimization, though is a focus from the environmental angle, shall be recommended only at point sources where there is no scope of cross-infection.

2.10.6 Segregation of Waste at Source

Segregation of wastes is the key to the success of bio-medical waste management. Bio-Medical wastes would have to be managed by destruction, dis-infection and ultimate disposal. With this in view, wastes would have to be segregated into incinerable wastes/ destructible wastes and dis-infectable wastes in the specific/designated closed bins with different colours including separate COVID-19 bins as explained in table no. 1.2 & 2.2. This organization proposes to establish an incinerator and an autoclave, thus wastes would have to be segregated into incinerable and autoclavable wastes. Incinerable wastes include human anatomical wastes, animal carcasses, placenta, cotton, bandage, soiled materials and other similar wastes that have come in contact with the body fluids. Dis-infectable wastes include plastics, glass, metal, rubber and other similar materials. These would include syringes, needles, ampoules, blades and many more.

Waste segregation will reduce the load of bio-medical waste and this also minimizes the environmental impacts associated with further processing. Waste will have to be segregated into domestic refuse, hazardous waste and infectious waste separately. Further the infectious waste will have to be segregated into plastics, metals, and other infectious waste generated. Segregation is done effectively if performed at source. CPCB has issued clear guidelines for colour coded segregation.

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2.10.7 Collection and Transportation

Collection of Bio-Medical Waste

The Collection of Bio Medical Waste will be carried out in a manner so as to avoid any possible hazard to human health and environment. Following steps will be followed for collection of the waste from bio-medical units:-

- Segregated waste will be collected from the endpoint of healthcare units on a daily basis by the staff.
- The waste will be collected from the colour coded bags in health care units to colour coded containers (non-chlorinated bags) in dedicated vehicles. Sharps will be collected in puncture proof containers.
- A Record Book will be maintained by the Healthcare unit in acknowledgement of waste collected.
- Non-segregated waste will not be accepted and such incidents will be reported to the prescribed authority.
- All the collection staff will be equipped with protective gears for handling Biomedical Waste.
- Each and every care will be taken to ensure that the segregated biomedical waste, handed over by the Health care unit, to reach Bio Medical Waste Treatment Facility without any damage, spillage and unauthorized access by public or animals etc.

➤ Covid-19 Isolation Wards

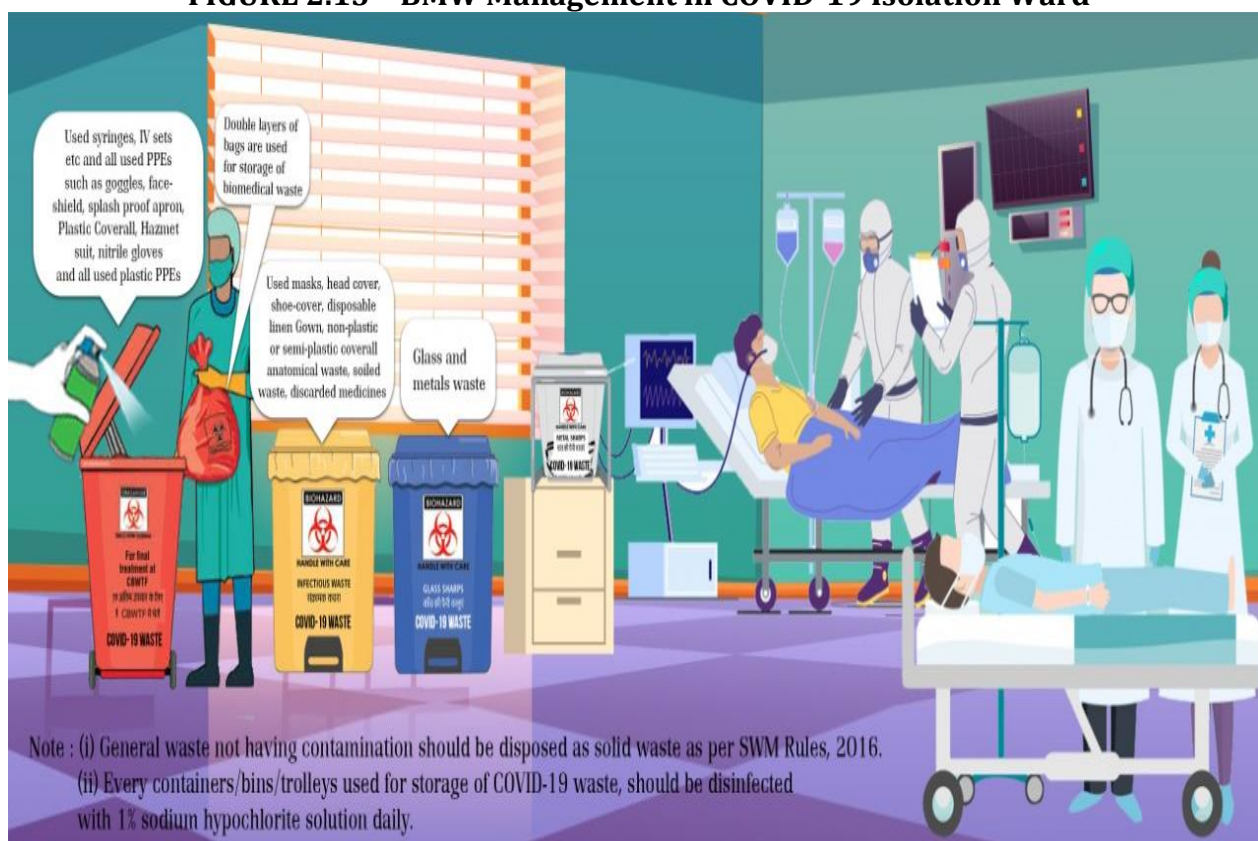
- Healthcare Facilities having isolation wards for COVID-19 patients need to follow these steps for ensure safe handling and disposal of bio-medical waste generated during treatment.
- Keep separate colour coded bins/bags containers in wards and maintain proper segregation of waste as per BMW Rules -2016 and amended and CPCB guidelines for implementation of BMW Management Rules.
- As precaution double layered bags (using 2 bags) should be used for collection of waste from COVID-19 isolation wards so as to ensure adequate strength and no-leaks.
- Collect and store biomedical waste separately prior to handling over the same CBWTF. Use a dedicated collection bin labelled as COVID-19 waste and keep separately in temporary storage prior to handling over to authorise staff of CBWTF. Biomedical waste collected in such isolation wards can also be lifted directly from the wards into the CBWTF collection van.

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- In addition to mandatory labelling, bags/containers used for collecting biomedical waste from COVID-19 wards, should be labelled as COVID-19 Waste. This marking would enable CBWTF to identify easily to priority treatment and disposal immediately upon receipt.
- General waste not having contaminated should be disposed as Solid waste as per SWM Rules, 2016.
- Maintain a separate record of waste generated from COVID-19 isolation wards.
- Use dedicated trolley and collection bins in COVID-19 isolation wards. A label COVID-19 Waste to be pasted on these items also.
- The (inner and outer) surface of containers/bins/trolleys used for storage of COVID-19 Waste should be disinfected with 1% sodium hypochlorite solution.
- Report opening or operation of COVID-19 wards to SPCBs.
- Depute dedicated sanitation worker separately for BMW and general solid waste so that waste can be collected and transferred timely to temporary waste storage areas.

Waste coming from COVID 19 patients to the CBWTF facility will be disposed as per Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of COVID-19 Patient dated 26th April 2022.

FIGURE 2.13 – BMW Management in COVID-19 Isolation Ward



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FIGURE 2.14- STORAGE AND HANDLING OF COVID-19 WASTE



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➤ **Bar Code Labelling**

There shall be two types of bar code labelling:

1. Bar code or QR code label shall be pre-printed directly on the designated colour coded bags/containers, which may be procured by HCF through the Operator of a CBMWTF or through any vendor, fulfilling the specifications stipulated under CPCB guidelines; or
2. Bar code or QR code labels shall be pasted on the designated colour coded bags/ containers, which can be procured by the HCF either through the Operator of a CBMWTF or through Vendor.

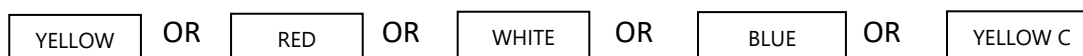
Specification of Bar-code or QR code label:

The Bar code label for use on the colour coded bags or containers for handling bio-medical waste should have following specifications;

Colour mark on the label: A colour mark or text is required on bar code label for easy identification of the bar code (by the workers handling bio-medical waste) with designated colour coded bag or container. The bar code should have a colour mark (in Yellow/Red/White/Blue) in the form of block of size at least 7 mm X 7 mm or Text of font size 12 specifying the colour of the BMW in the bags or containers. The colour mark or Text shall be placed at the top left corner of the bar code label.



In case of cytotoxic drugs, the alphabet 'C' should be printed on yellow colour block. In case of B/W label, colour mark can be specified in the form of 'Text' specifying the colour of BMW waste as "YELLOW" / "RED" / "WHITE" / "BLUE" printed on top left side of the bar code label.



Unique Number of the HCF and its specification: Unique number to each HCF shall be developed and provided by concerned SPCB/PCC/DGAFMS. Unique number can be produced based on following criteria:-

- i. Name of the Health Care Facility (HCF): The name of the HCF shall be indicated by first five alphabets in the name of the by the HCF. In case the name of HCF is less than 5 letters, the rest of spaces may be filled with *. (E.g., All India Institute of Medical Sciences - ALLIN). Followed by:
- ii. Name of the Place where HCF is located: Name of the place where HCF is located shall be indicated by 6-digit local pin code provided by Postal department. Followed by;

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III. Name of the State/ UT: Name of the State/UT should be in the form of two-digit alphabetical number. Followed by:

iv. Type of HCF: Type of HCF should be in the form of alphabetical number in capital but not more than two letters i.e., first two letters of a type of HCF/first letter in two words of a HCF) as given below:

BH - Bedded Hospital

CL - Clinic

DI - Dispensary

HO - Homeopathy

MH - Mobile Hospital

SI - Siddha

UN - Unani

VH - Veterinary Hospital

YO - Yoga

AH - Animal House

BB - Blood Bank,

DH - Dental Hospital

NH - Nursing Home,

PL - Pathological Laboratory

FA - Institutions/Schools/Companies etc. with First Aid facilities

HC - Health Camp

and followed by;

Numerical Number of the HCF: Numerical number of the health care facility shall not be more than five numerical numbers to be assigned to the HCF in between i.e., 00001 to 99999.

Concerned SPCB/PCC shall upload a list of HCFs along with their unique number of HCF at their website. In case of long list, SPCBs may provide search option on their website for retrieving unique code vis-à-vis name of HCF

Label sequence Number: CBMWTFs should use central software to generate unique label sequential number. The operator of CBMWTF should provide range of such sequence numbers to label vendors to produce labels or produce labels by themselves. The records of label sequence numbers and to whom allotted should be maintained for verification of SPCBs/PCCs.

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Specifications for the bar code label: In addition to the specification of Bar code, the bar code label should have following specifications as detailed below:

- i. The bar code label should be pasted only at the centre or close to centre of the colour coded bag or container prescribed under the BMW Rules, 2016 and further amendments made thereof.
- ii. Size of bar code label should be such that it should be able to accommodate desired information specified in this section.
- iii. The bar code / QR code should be black in colour and its back ground should be white colour and it should be clearly legible on the label.
- iv. The bar code label should be tamper proof, water proof and its colour should not be faded in due course of at least for 48 hours after its use.
- v. The bar code label should be able to resist the prevailing atmospheric temperatures and should not fade its colour till its end of life.
- vi. Bar code labels should not have any traces of heavy metals or any other objectionable chemical constituent.
- vii. All bar-coded labels should be of good quality preferably a very chromo paper label having specifications prescribed under these guidelines.
- viii. The adhesive used for bar code label should be pressure sensitive, tear resistance and should be of acrylic based adhesive and after use of labels on the colour coded bag (s) or container(s), the label should not peel off on its own or by normal abrasion during handling.

➤ **Transportation of Bio-Medical Waste**

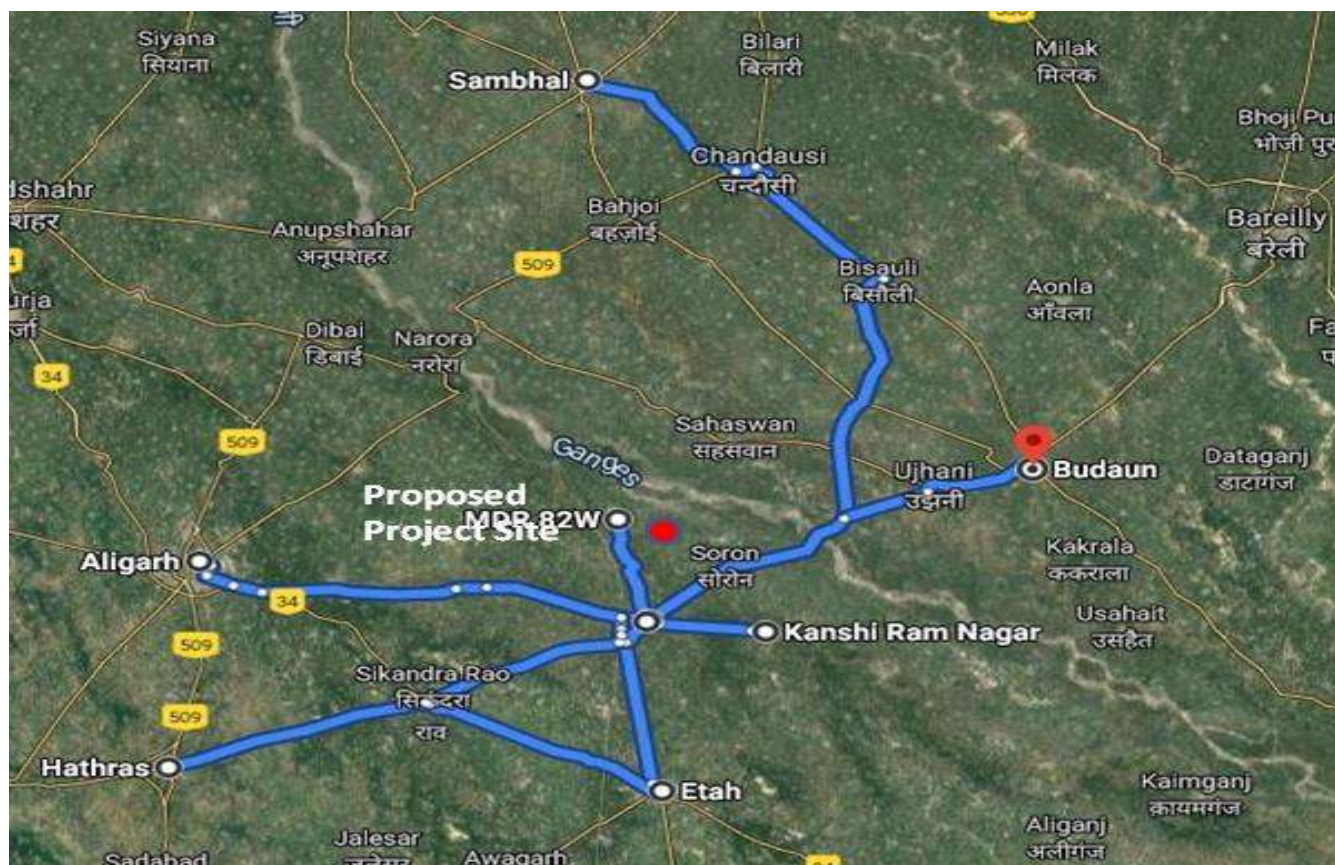
The Bio-Medical Waste collected will be transported to CBWTF in a fully covered specially designated vehicle. The vehicle will be designed as per the guidelines of CPCB.

- Separate cabins will be provided for driver/staff and the bio medical waste cabin.
- The base of the waste cabin will be leak proof and will be easy to wash and disinfect.
- The inner surface of the waste cabin will be made of smooth surface to minimize water retention.
- The vehicle will be properly labelled with the symbol of Biohazard as per schedule III of the Rules and will display the name, address and telephone number of the Company.

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- The waste cabin will have provision for sufficient opening from rear side so that Bio Medical Waste can be easily loaded and unloaded.
- The vehicles will be provided with the first aid kit to handle emergency situations.
- Mobile phones will be given at all the vehicles for effective supervision and monitoring the collection and transportation work.

FIGURE 2.15- HAULAGE ROUTE MAP



➤ Transportation Vehicle- Specification

- A fleet of 10 dedicated vehicles designed as per the specification and guidelines of CPCB/UPPCB
- Separate cabins for driver/staff and the bio medical waste.
- The inner surface of the waste cabin will be smooth to minimize water retention, easy to wash and disinfect.
- The waste cabin will have provision for sufficient opening from rear side so that BMW can be easily loaded and unloaded.
- Each vehicle will be fabricated so as to carry BMW without any spillage, leakage and meeting the other statutory requirements.

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- The vehicles will be properly labelled with the symbol of Biohazard as per schedule III of the Rules and will display the name, address and telephone number of the Company.
- The vehicles will be provided with the first aid kit to handle emergency situations.
- Vehicles will be equipped with communication equipment's and safety gadgets.
- Apart from above, the GPS Tracking system will be installed in vehicles to monitor the movement of vehicles.

➤ **Waste Storage Area**

Main waste storage room will be provided near the entry of the Common Bio Medical Waste Treatment Facility to unload and store all the Bio Medical Waste that will be transported to the facility by vehicles.

- The Size of the room will be adequate to store all wastes transported to the CBWTF.
- The front portion of the room will be utilized for unloading the wastes from the vehicle and back or side portion shall be utilized for shifting the wastes to the respective treatment equipment.
- The area in front of the room will be made impermeable so that any liquid spilled during unloading does not percolate into the ground. The liquid, if any, generated during handling of waste and washing, shall be diverted to the inlet of ETP.
- Waste shall be stacked with clear distinction as per the colour coding.
- The main waste storage room will be well ventilated, easy to wash floors and walls and will have smooth and fine surfaces.

➤ **Treatment Equipment Room**

- A separate housing will be provided for each treatment equipment at the CBWTF.
- Each room will have well designed roof and walls, will be properly ventilated and easy to wash. The floor and interior finishing of the room will be such that chances of sticking/harboring of micro-organisms are minimized. Smooth and fine flooring and tiles walls will be provided to a height of 2 metres from the floor.
- A separate cabin will be provided to supervise the operation of the equipment and to record the waste handling and equipment operation data.
- Attached to each equipment room there will be two waste storage rooms, one for the storage of untreated waste and another for treated waste.
- Following separate treatment rooms will be provided:

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(i) Incinerator Room

(ii) Autoclave Room

(iii) Shredder Room

➤ **Treated Waste Storage Room**

A separate room will be provided for the storage of treated waste. The waste shall be stored in separate groups as per the disposal options. This room will also be provided with smooth and fine flooring and tiles on walls. The room will be well ventilated.

➤ **Disposal of Treated Bio Medical Waste**

The treated bio medical waste will be disposed as under:

- Plastic waste after disinfection and shredding will be handed over to authorized plastic waste recycler.
- Disinfected sharps will be encapsulated on site.
- An ash pit will be provided inside the CBWTF for storage of Incineration ash. Ash pit will be non-leachate and will be covered properly to avoid any rain water entry. If available, the ash will be sent to TSDF site as specified by the prescribed authority.
- Oil and grease will be incinerated.
- Treated water will be used for gardening purpose.

➤ **Washing Facility for Vehicle/Containers**

A separate area will be provided for washing of vehicles/containers. The floor will be smooth and impermeable so that liquid does not percolate into the ground. The liquid generated out of washing of vehicles and containers will be collected and treated in an Effluent Treatment Plant. The impermeable area will be of appropriate size so as to avoid to spillage of liquid during washing.

2.10.8 Disinfection and Destruction

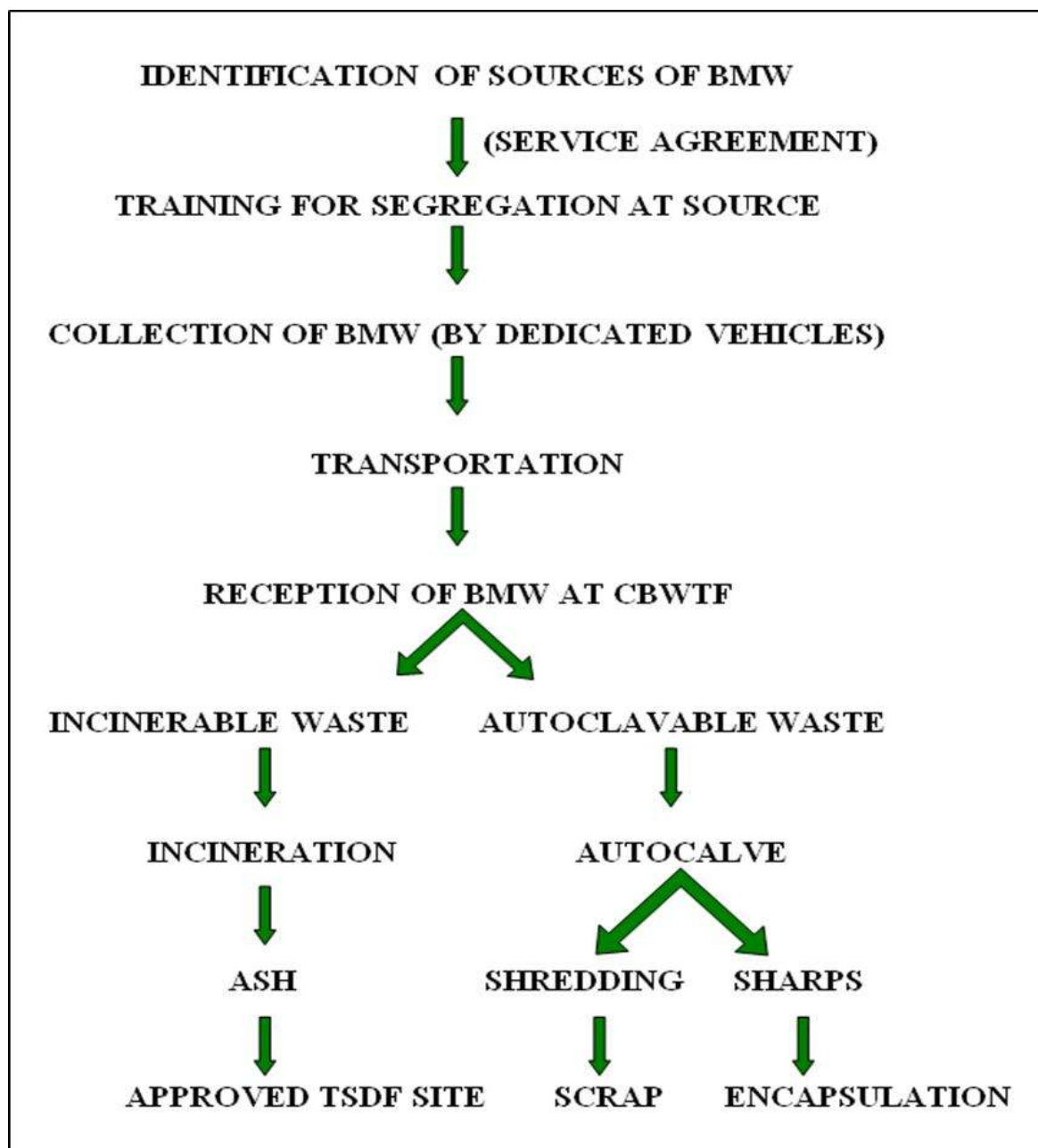
Upon receipt at the facility, wastes containers shall be unloaded. Wastes based on their colour codes shall be separated and properly treated and disposed off as per MoEF&CC rules the incinerable waste shall be loaded into the incinerator while autoclavable shall be loaded into the autoclave for dis-infection. Residue from incinerator units shall be disposed into a landfill and waste from autoclave shall send to authorized recyclers. Detailed process description of the treatment technologies is presented in the subsequent sections.

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2.10.9 Disposal

Ash, residue from high temperature incineration and other material residues from the process shall be collected into containers and shall be sent to TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi (VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101.

FIGURE 2.16– FLOW CHART-PROPOSED BMW FACILITY



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CHAPTER-III

DESCRIPTION OF THE ENVIRONMENT

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CHAPTER-III

DESCRIPTION OF THE ENVIRONMENT

3.1 Preamble

Baseline environmental status in and around the proposed project site depicts the existing environmental conditions of Air, Noise, Water, Soil, Biological and Socio-economic environment. Considering the project as the centre, a radial distance of 10 km is deemed as 'study area' for baseline data collection and environmental monitoring. Baseline data was collected for various environmental attributes so as to compute the impacts that are likely to arise due to proposed Common Bio-Medical Waste Treatment Facility at Village- Kumraua, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh.

The main aim of the baseline study is to identify the critical environmental attributes which will be affected and have adverse impacts on the surrounding systems due to the present scenario. This study is carried out during the project planning stage itself, so that the proposed facilities can be implemented in a technically, financially and environmentally sustainable long term basis.

The study depends mainly upon two factors. First is estimation of impact from existing project on the environment and the second is assessment of the baseline environmental condition. Both are key factors to arrive at the post project scenario. The estimated impact due to the proposed project can be superimposed over the existing conditions to arrive at the post project scenario. The scope of the baseline studies includes detailed characterization of the following environmental components, which are most likely to be influenced by setting up the proposed facility:

- Meteorological Conditions
- Ambient Air Quality
- Noise Levels
- Water Quality (Surface & Ground Water)
- Soil Quality
- Biological Environment
- Land Environment
- Socio Economic Studies

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a) Study Period

The baseline data generation for the CBMWTF project has been carried out during the Pre Monsoon of (March 2021 to May 2021). The data is collected with respect to meteorological conditions, air pollution levels, noise levels, water quality, soil quality, land use and socio economic conditions were carried out during the study period. The analysis results of the baseline data are enclosed as annexure – IX.

3.2 Micrometeorology

The study of micrometeorological conditions of a particular region is of utmost importance to understand the variations in ambient air quality status in that region. The prevailing micrometeorology at project site plays a crucial role in transport and dispersion of air pollutants released from the project site. The persistence of the predominant wind direction and wind speed at the project site will decide the direction and extent of air pollution impact zone. The principal variables which affect the micrometeorology are horizontal transport and dispersion (average wind speed and directions), convective transport and vertical mixing (atmospheric stability) and topography of the area towards local influences.

The micrometeorological data recorded in the study region as well as surface meteorological data procured from IMD corresponding to nearest available observatories are appropriately used in this study. The hourly record of wind speed and wind direction during the study period was used for computing the relative percentage frequencies of wind occurrences in various directions. The observed meteorological data at site is given in Table-3.1. The wind rose diagram for winter season is presented in Figure 3.1. Secondary meteorological data has been mentioned in Table 3.2 is procured from the nearest IMD station of Aligarh.

TABLE 3.1 METEOROLOGICAL DATA FROM IMD, CLIMATOLOGICAL (1981-2010)

Period	Temp (°C)		Humidity (%)		Rain fall	Predominant wind direction
	Min	Max	Min	Max	(mm)	
March 2021	15	32.2	7.5	69.7	0	NW to SE
April 2021	17.2	38.5	9.9	64.2	0	
May 2021	17.9	38.6	10.6	75.0	0	

During the summer season, the winds were predominantly recorded from NW. The average wind speed for the season was observed to be 2.13 m/s.

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TABLE 3.2 METEOROLOGICAL DATA FROM IMD, CLIMATOLOGICAL (1981-2010)

IMD Station–Aligarh							
Month	Temperature		Relative Humidity		Rainfall	Wind Direction	
	Min	Max	Min	Max	Total	1 st Predominant	2 nd Predominant
January	3.3	24.7	64	83	13.4	W	SE
February	5.2	28.6	56	76	15.4	W	NW
March	9.2	35.9	46	64	9.1	NW	W
April	14.3	41.6	32	48	9.8	NW	W
May	19.3	44.4	34	51	29	W	NW
June	22.1	44.3	46	61	65.8	W	NE
July	22.8	39.9	67	79	207.4	NW	NE
August	22.7	37	75	84	234.5	E	W
September	20.4	36.9	67	81	112.2	W	E
October	14.2	36	53	72	19.7	W	E
November	9.1	31.9	57	72	4.3	W	NW
December	5	26.6	61	78	7.2	W	NW
	3.2	44.5	55	71	727.7 mm	W	NW

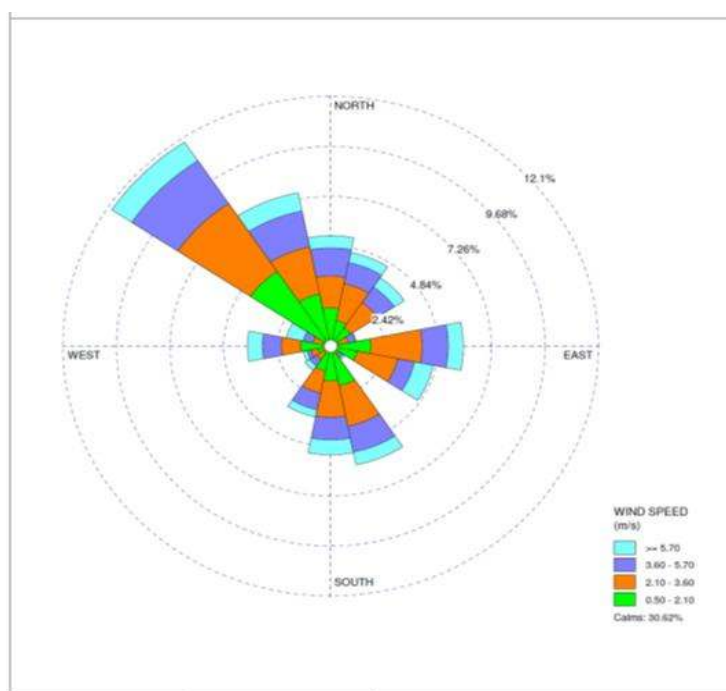
Source: GOI, Ministry of Earth Sciences, IMD, Climatological Tables - 1981-2010

TABLE 3.3 SEASON (March 2021 to May 2021) FREQUENCY DISTRIBUTION TABLE

Direction/ Wind Classes (m/s)	0.5-2.0	2.0-3.5	3.5-5.0	>5.0	Total (%)
N	0.77	0.54	0.23	0.59	2.13
NNE	1.31	1.81	0.77	0.95	4.85
NE	0.95	1.54	0.54	0.68	3.71
ENE	0.45	0.45	0.18	0.23	1.31
E	1.36	2.17	0.72	0.95	5.21
ESE	1.72	1.99	0.63	1.27	5.62
SE	0.05	0.05	0.14	0.00	0.23
SSE	1.95	1.99	0.91	1.09	5.93
S	1.45	1.72	0.63	1.04	4.85
SSW	1.31	1.22	0.32	1.00	3.85
SW	0.27	0.36	0.18	0.18	1.00
WSW	0.54	0.32	0.23	0.23	1.31
W	1.18	0.86	0.63	1.09	3.76
WNW	0.59	0.54	0.32	0.82	2.26
NW	4.17	4.21	1.49	2.17	12.05
NNW	3.13	3.08	1.77	1.72	9.69
Calms (<0.5m/s)					31.92
Total					100%
Note: 1. All Values are in Percentage					

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FIGURE 3.1 WIND ROSE DIAGRAM MARCH 2021 TO MAY 2021



3.3 Ambient Air Quality

The ambient air quality in the study area was monitored as per MoEF&CC guidelines. The prime objective of the baseline air quality study is to assess the existing ambient air quality of the area with reference

The baseline status of the ambient air quality has been assessed through a scientifically designed ambient air quality network. The design of monitoring network in the air quality surveillance programme has been made based on the following considerations to conventional air pollutants.

Methodology adopted for the study

- Topography of the study area.
- Representation of regional background.
- Populated and sensitive areas.
- Screening of maximum ground level concentrations and distances of their likely occurrences as per climatologically normal.
- Representation of valid cross sectional distribution in downwind direction

Ambient Air Quality Monitoring (AAQM) stations were installed at 8 different locations with due consideration to the above mentioned points. AAQ locations were selected in downwind, cross wind and upwind direction of the proposed project location. The details of air quality monitoring

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stations are given in Table 3.4. The map showing ambient air quality sampling locations is given in Figure 3.2.

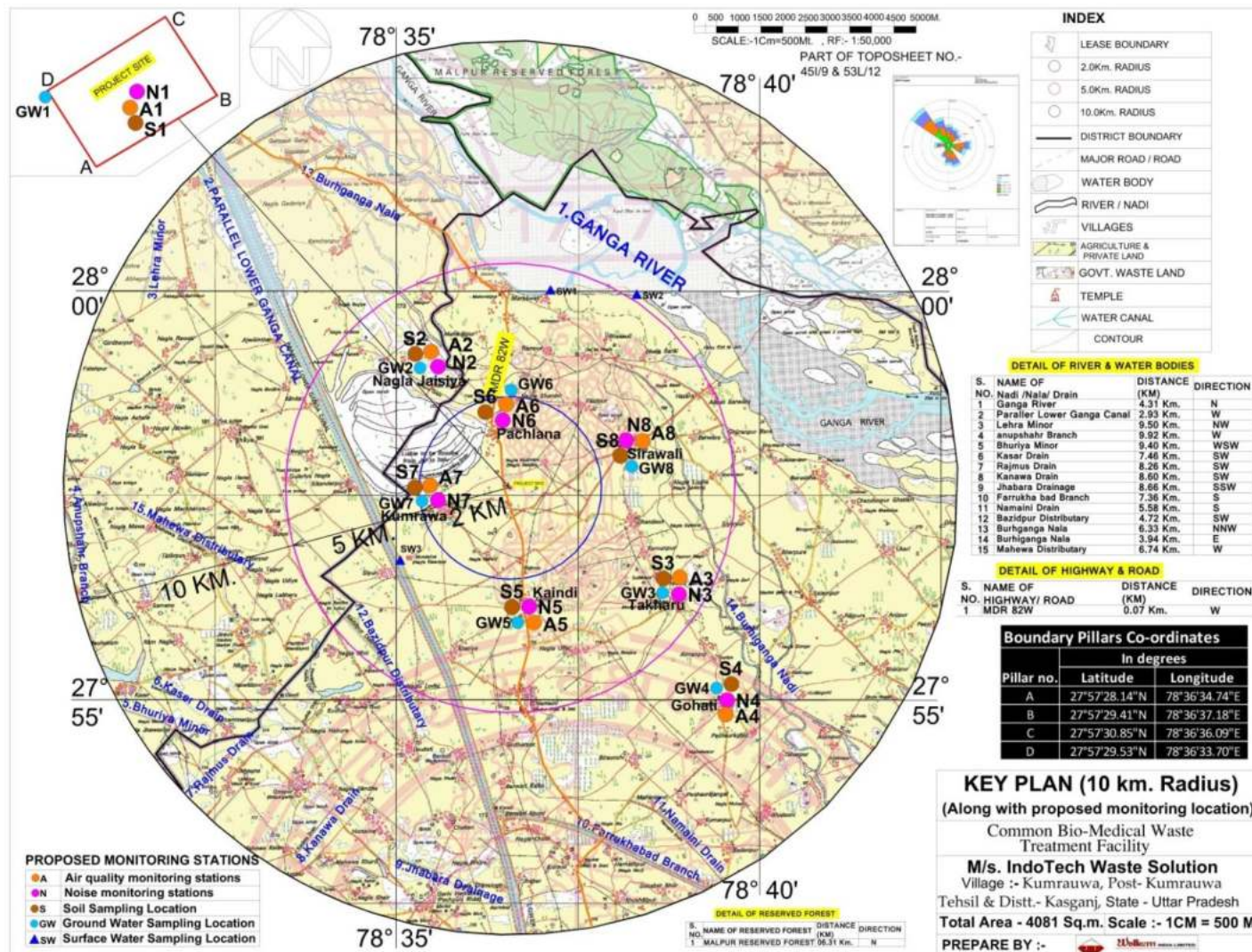
The common air pollutants namely Particulate matter (PM₁₀& PM_{2.5}), Sulphur dioxide (SO₂), the oxides of nitrogen (NO_x), Carbon Monoxide (CO), Ammonia (NH₃), Benzene (C₆H₆), Methane (CH₄) Lead (Pb), Nickel (Ni), Ozone (O₃), Arsenic (As), Hydrogen Sulfide (H₂S), VOCs, Mercury (Hg) and Benzo (a) Pyrene (BaP) were sampled on 8/24 hourly and results were averaged to 24 hours to meet the requirements of the MoEF&CC and compared with the standards stipulated by CPCB. The detailed ambient air quality levels are given in Table 3.5 – 3.9. and analysis reports are attached as **Annexure- IX**.

TABLE 3.4 AMBIENT AIR QUALITY MONITORING LOCATIONS

Code	Name of the Location	W.R.T Site			Latitude (N)	Longitude (E)
		Direction	Wind	Distance km		
A1	Project Site	-	Core	-	27°57'29.51"	78°36'35.05"
A2	Nagla Jaisiya	NW	UW	3.0	27°58'49.35"	78°35'28.59"
A3	Takharu	SE	DW	4.2	27°56'14.92"	78°38'47.76"
A4	Gohati	SE	DW	6.8	27°55'00.33"	78°39'40.57"
A5	Kaindi	S	CW	2.5	27°56'05.83"	78°36'45.41"
A6	Pachlana	N	CW	1.4	27°58'14.97"	78°36'22.39"
A7	Kumraua	W	CW	1.2	27°57'26.79"	78°35'50.36"
A8	Sirawali	ENE	CW	2.7	27°57'56.08"	78°38'12.03"

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FIGURE 3.2 AMBIENT AIR QUALITY MONITORING LOCATIONS



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TABLE 3.5 AMBIENT AIR QUALITY LEVELS PM₁₀, PM_{2.5} SO₂, (µg/m³)

Code	Name of the Location	PM ₁₀			PM _{2.5}			SO ₂		
		Min	Max	98 th %	Min	Max	98 th %	Min	Max	98%
A1	Project Site	57.02	96.25	94.81	33.60	47.21	46.44	8.06	15.70	15.69
A2	Nagla Jaisiya	55.29	72.34	72.01	29.02	38.99	38.94	6.23	12.31	12.19
A3	Takharu	56.09	78.00	76.95	29.40	41.29	40.30	6.84	13.17	13.05
A4	Gohati	50.80	63.42	62.60	26.16	35.79	35.11	7.82	11.28	11.14
A5	Kaindi	46.86	62.66	62.67	26.16	36.17	35.61	5.72	9.25	9.00
A6	Pachlana	54.03	66.18	66.11	30.93	38.64	38.64	6.85	8.73	8.57
A7	Kumraua	49.13	65.23	63.62	27.86	33.43	33.37	6.08	9.39	9.24
A8	Sirawali	47.00	86.84	81.11	25.83	39.91	39.32	8.29	14.33	14.03
98th Percentile Range		62.60 to 94.81			33.37 to 46.44			8.57 to 15.69		
NAAQ Standards 2009		100 (24 hourly)			60 (24 hourly)			80 (24 hourly)		

TABLE 3.6 AMBIENT AIR QUALITY LEVELS NO_x, NH₃, O₃ (µg /m³)

Code	Name of the Location	NO _x			NH ₃			O ₃		
		Min	Max	98 th %	Min	Max	98 th %	Min	Max	98%
A1	Project Site	12.09	19.21	18.63	28.60	66.60	60.90	14.75	44.97	42.90
A2	Nagla Jaisiya	11.75	16.56	16.39	27.90	51.99	51.59	19.48	38.10	36.52
A3	Takharu	11.07	17.85	17.57	25.56	51.25	49.63	14.75	44.97	42.90
A4	Gohati	11.04	17.52	17.26	22.43	41.73	39.67	14.75	44.97	42.25
A5	Kaindi	10.98	14.52	14.47	16.38	43.18	42.58	19.05	38.24	37.53
A6	Pachlana	12.46	16.14	16.14	38.94	51.57	50.43	18.05	39.67	36.74
A7	Kumraua	11.06	15.42	15.29	35.76	41.54	41.06	18.05	39.67	39.67
A8	Sirawali	9.39	17.07	16.98	25.38	42.57	41.87	18.05	39.67	38.24
98th Percentile Range		14.47 to 18.63			39.67 to 60.90			36.52 to 42.90		
NAAQ Standards 2009		80 (24 hourly)			400 (24 hourly)			100 (8 hourly)		

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TABLE 3.7 AMBIENT AIR QUALITY LEVELS OF VOLATILE ORGANIC POLLUTANTS

Code	Name of the Location	CO mg/m ³			C ₆ H ₆ µg/m ³			CH ₄ mg/m ³		
		Min	Max	98 th %	Min	Max	98 th %	Min	Max	98 th %
A1	Project Site	0.55	0.95	0.90	<0.2	<0.2	<0.2	0.38	0.52	0.52
A2	Nagla Jaisiya	0.57	0.96	0.95	<0.2	<0.2	<0.2	0.32	0.53	0.52
A3	Takharu	0.44	1.02	1.01	<0.2	<0.2	<0.2	0.30	0.51	0.51
A4	Gohati	0.45	1.02	1.01	<0.2	<0.2	<0.2	0.30	0.51	0.51
A5	Kaindi	0.44	1.02	1.01	<0.2	<0.2	<0.2	0.30	0.52	0.52
A6	Pachlana	0.45	0.95	0.90	<0.2	<0.2	<0.2	0.29	0.48	0.47
A7	Kumraua	0.34	1.02	0.96	<0.2	<0.2	<0.2	0.30	0.50	0.50
A8	Sirawali	0.46	0.95	0.95	<0.2	<0.2	<0.2	0.32	0.50	0.50
98th Percentile Range		0.90 to 1.01			<0.2			0.47 to 0.52		
NAAQ Standards 2009		4			5					

TABLE 3.8 AMBIENT AIR QUALITY LEVELS (LEAD, NICKEL, ARSENIC, HYDROGEN SULFIDE (µg/m³), BENZO PYRENE-ng/m³)

Parameter	Lead - µg/m ³	Nickel - ng/m ³	Arsenic - ng/m ³	Benzo (a) Pyrene - ng/m ³	Hydrogen Sulfide- PPM
98 th Percentile Range	*BDL (<0.05)	BDL (<5)	BDL (<1.0)	BDL (<0.2)	BDL (0.05)
NAAQ Standards & CPCB Norms	1.0	20	6	1.0	0.36

*BDL – Below Detectable Limit

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Regional Scenario

Particulate Matter

The 98th percentile of Particulate Matter <2.5µm recorded within the study area were in the range of **33.37 to 46.44 µg/m³**. The 98th Percentile of Particulate Matter <10µm recorded within the study area were in the range of **62.60 to 94.81 µg/m³**. The 24 hourly average values of Particulate Matter <2.5µm & Particulate Matter <10µm were compared with national ambient air quality standards and found that all sampling locations recorded values within the applicable limits of residential and rural area limits for all locations in the study area.

Sulphur dioxide

The 98th Percentile of SO₂ recorded within the study area was in the range of **8.57 to 15.69 µg/m³**. The 98th percentile values of SO₂ were compared with the national ambient air quality standards and it was found that all sampling locations recorded values much lower than the applicable limit to 80 µg/m³ for industrial, residential and rural areas.

Oxides of Nitrogen

The 98th Percentile of NO_x recorded within the study area was in the range of **14.47 to 18.63 µg/m³**. The 24 hourly average values of NO_x were compared with national ambient air quality standards and it was found that all the sampling locations recorded values much lower than the applicable limit of 80µg/m³ for industrial, residential and rural areas.

Ozone (O₃)

The 98th Percentile of O₃ recorded within the study area was in the range of **36.52 to 42.90 µg/m³**. The 8 hour average values of Ozone were compared with the national ambient air quality standards and found that the recorded values were within the applicable limits of residential and rural area limits for all the locations in study area.

Carbon Monoxide (CO)

The 98th Percentile of CO recorded within the study area was in the range of **0.90 to 1.01 mg/m³**. The 8 hourly average values of CO were compared with national ambient air quality standards and it was found that all the sampling locations recorded values much lower than the applicable limit of 2000µg/m³ (2 mg/m³) for industrial, residential and rural areas.

Ammonia (NH₃)

The 98th Percentile of Ammonia recorded within the study area was in the range of **39.67 to 60.90 µg/m³**.

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Remaining Parameters (Lead, Nickel, Arsenic and Benzo (a) Pyrene) are all falling below detectable Limits. Ambient Air Quality Standards (NAAQS)/CPCB are given in **Table 3.9**.

TABLE 3.9 NAAQ/CPCB STANDARDS FOR AMBIENT AIR QUALITY

S.No	Pollutant	Time weighted Average	Concentration in Ambient Air		Method of Measurement
			Industrial, Residential, Rural and Other Area	Ecologically sensitive area (notified by Central Govt.)	
1	Sulphur Dioxide (SO ₂), µg/m ³	Annual*	50	20	➤ Improved West and Geake ➤ Ultraviolet fluorescence
		24 hours**	80	80	
2	Nitrogen Dioxide (NO ₂), µg/m ³	Annual*	40	30	➤ Modified Jacob & Hochheiser (Na-Arsenite) ➤ Chemiluminescence
		24 hours**	80	80	
3	Particulate Matter (size less than 10 µm) or PM ₁₀ µg/m ³	Annual*	60	60	➤ Gravimetric ➤ TOEM ➤ Beta attenuation
		24 hours**	100	100	
4	Particulate Matter (size less than 2.5 microns) or PM _{2.5} µg/m ³	Annual*	40	40	➤ Gravimetric ➤ TOEM ➤ Beta attenuation
		24 hours**	60	60	
5	Ozone (O ₃) µg/m ³	8 hours**	100	100	➤ UV photometric ➤ Chemiluminescence ➤ Chemical method
		1 hour**	180	180	
6	Lead (Pb) µg/m ³	Annual*	0.5	0.5	➤ ASS / ICP method after sampling on EPM 2000 or equivalent filter paper ➤ ED – XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide	8 hours**	2	2	Non Dispersive Infra RED (NDIR) Spectroscopy

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S.No	Pollutant	Time weighted Average	Concentration in Ambient Air		Method of Measurement
			Industrial, Residential, Rural and Other Area	Ecologically sensitive area (notified by Central Govt.)	
	(CO) mg/m3				
		1 hour**	4	4	
8	Ammonia (NH ₃) µg/m3	Annual*	100	100	➤ Chemiluminescence ➤ Indophenol blue method
		24 hours**	400	400	➤
9	Benzene (C ₆ H ₆) µg/m3	Annual*	5	5	➤ Gas chromatography based continuous analyser ➤ Adsorption and desorption followed by GC analysis
10	Benzo (a) Pyrene (BaP) – particulate phase only ng/m3	Annual*	1	1	Solvent extraction followed by HPLC / GC analysis
11	Arsenic (As) ng/m3	Annual*	6	6	AAS / ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni) ng/m3	Annual*	20	20	

*Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

**24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

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3.4 Water Quality Assessment

Surface water and ground water samples were collected from different sources within the study area and analyzed for some important physical and chemical parameters including heavy metals for depicting the baseline status of the study area.

During the study period, a total of 8 ground water samples and 3 surface water samples were collected from the study area in order to assess the water quality. Ground water samples were drawn from hand pumps and bore wells used by the villagers for their domestic needs. Surface water samples were collected from river/nallas/lake in the study area. Details of the sampling locations are given in Table 3.10 and Figure 3.3.

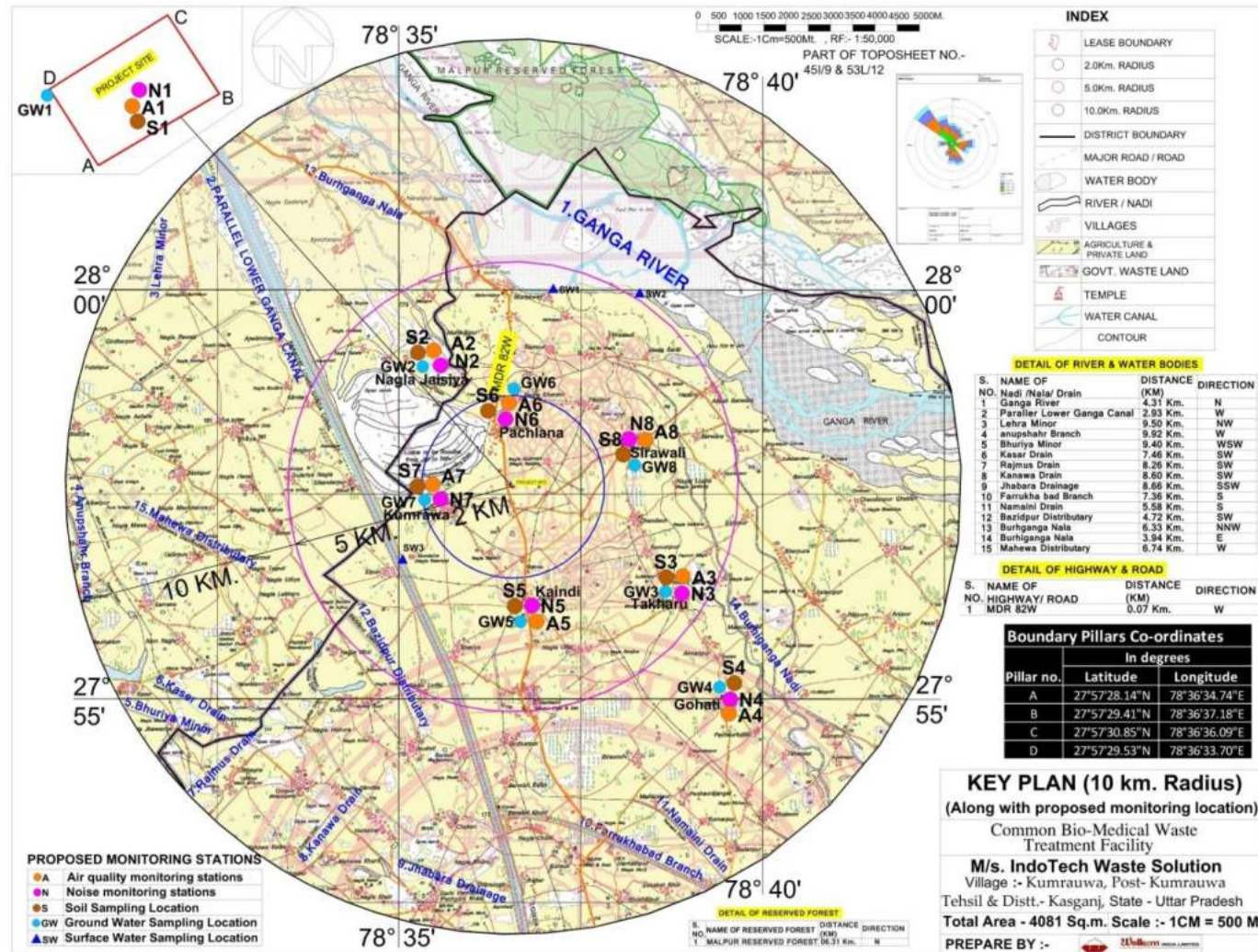
Water samples collected from the locations below were analyzed for important water quality parameters and the analytical results were compared with IS: 10500-2012 drinking water standards. The results are shown in Table 3.11. Surface water results were compared with IS: 2296-1992 and shown in Table 3.12.

TABLE 3.10 WATER QUALITY MONITORING LOCATIONS

Code	Name of the Location	W.R.T. Site		Latitude (North)	Longitude (East)
		Distance (km)	Direction		
Ground Water					
GW1	Project Site	-	-	27°57'30.18"	78°36'31.31"
GW2	Nagla Jaisiya	3.0	NW	27°58'49.35"	78°35'28.59"
GW3	Takharu	4.2	SE	27°56'14.92"	78°38'47.76"
GW4	Gohati	6.8	SE	27°54'56.43"	78°39'35.30"
GW5	Kaindi	2.5	S	27°56'05.52"	78°36'45.10"
GW6	Pachlana	1.4	N	27°58'14.97"	78°36'22.39"
GW7	Kumraua	1.2	W	27°57'26.79"	78°35'50.36"
GW8	Sirawali	2.7	ENE	27°57'56.08"	78°38'12.03"
Surface Water					
SW1	Ganga River (Up-stream)	4.3	NE	27°59'18.61"	78°38'16.96"
SW2	Ganga River (Down-stream)	5.2	NE	27°59'14.77"	78°39'06.06"
SW3	Parallel Lower Ganga Canal	2.8	SW	27°56'40.61"	78°35'04.18"

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FIGURE 3.3 GROUND WATER & SURFACE WATER QUALITY SAMPLING LOCATIONS



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TABLE 3.11 GROUND WATER SAMPLES ANALYSIS

S. No	Parameter	Unit	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8	IS:10500-2012 Standards	
											Acceptable	Permissible
1	Odor		Agreeable								Agreeable	
2	pH	-	7.15	7.10	7.28	7.08	7.22	7.03	7.17	6.96	6.5-8.5	No relaxation.
3	Turbidity	NTU	0.4	0.3	0.5	0.4	0.4	0.5	0.6	0.4	1	5
4	Elec. Cond	µs/cm	803.2	739.4	343.2	1079	337.9	414.6	486.4	560.4	-	-
5	Total Dissolved solids	mg/l	510	456	216	706	208	272	322	370	500	2000
6	Alkalinity as CaCO3	mg/l	280	360	218	300	198	192	202	276	200	600
7	Chlorides as Cl	mg/l	38	34	16	74	18	16	38	20	250	1000
8	Sulphates as SO4	mg/l	27.4	54.7	11.2	73.2	11.9	14.1	11.2	13.8	200	400
9	Nitrate as NO3	mg/l	3.3	5.5	2.4	3.8	3.8	1.7	2.9	1.7	45	No relaxation.
10	Total Hardness as CaCO3	mg/l	316	290	160	388	144	196	232	284	200	600
11	Calcium as Ca	mg/l	78.4	88.8	48	110.4	45.6	56	59.2	70.4	75	200
12	Magnesium as Mg	mg/l	28.8	16.3	9.6	26.9	7.2	13.4	20.2	25.9	30	100
13	Sodium as Na	mg/l	74.2	83.4	17.9	108.4	24.8	41.6	36.1	40.6	-	-
14	Potassium as K	mg/l	5.1	7.6	4.2	6.4	4.4	4.8	5.1	4.9	-	-
15	Phosphate as P	mg/l	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)		
16	Flouride as F	mg/l	0.4	0.5	0.3	0.5	0.3	0.3	0.4	0.4	1	1.5
17	Iron as Fe	mg/l	0.10	0.18	(<0. 1)	0.12	0.14	(<0. 1)	0.11	(<0.1)	0.3	No relaxation.
18	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	
19	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
21	Cadmium as Cd	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	
22	Chromium as Cr	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	
23	Copper as Cu	mg/l	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	0.05	1.5
24	Cyanide as CN-	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	No relaxation.
25	Arsenic as As	mg/l	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	0.01	0.05
26	Boron as B	mg/l	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	0.5	1
27	Zinc as Zn	mg/l	0.11	(<0.01)	(<0.01)	0.10	(<0.01)	(<0.01)	(<0.01)	0.11	5	15

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TABLE 3.12 SURFACE WATER SAMPLES ANALYSIS

Parameter	Unit	SW1	SW2	SW3	IS 2296 – 1992 Inland surface water Stds				
					A	B	C	D	E
Color	Pt-Co	<5	<5	<5	10	300	300	-	-
pH	-	7.11	7.18	7.29	6.5 – 8.5				
Odor	Agreeable				-	-	-	-	-
Turbidity	NTU	0.5	0.5	0.7	-	-	-	-	-
Elec. Cond	µs/cm	213.3	223.1	239.7	-	-	-	-	2250
Total Dissolved solids	mg/l	122	128	156	500	-	1500	-	2100
Alkalinity as CaCO ₃	mg/l	74	78	82	-	-	-	-	-
Chlorides as Cl	mg/l	11	12	14	250	-	600	-	600
Sulphates as SO ₄	mg/l	7.8	9.3	14.8	400	-	400	-	1000
Nitrate as NO ₃	mg/l	1.2	1.4	2.1	20	-	50	-	-
Total Hardness as CaCO ₃	mg/l	80	86	98	200	-	-	-	-
Calcium as Ca	mg/l	17.6	18.4	24.8	-	-	-	-	-
Magnesium as Mg	mg/l	9.6	9.6	8.6	-	-	-	-	-
Sodium as Na	mg/l	11.8	12.8	19.2	-	-	-	-	-
Phosphate as PO ₄	mg/l	(<0.1) BDL	(<0.1) BDL	0.10	-	-	-	-	-
Potassium as K	mg/l	2.4	2.7	2.6	-	-	-	-	-
Flouride as F	mg/l	0.2	0.2	0.2	1.5	1.5	1.5	-	-
Iron as Fe	mg/l	(<0.1) BDL	(<0.1) BDL	(<0.1) BDL	0.3	-	0.5	-	-
Lead as Pb	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL	0.1	-	0.1	-	-
Copper as Cu	mg/l	(<0.1) BDL	(<0.1) BDL	(<0.1) BDL	1.5	-	1.5	-	-
Zinc as Zn	mg/l	(<0.1) BDL	(<0.1) BDL	(<0.1) BDL	15	-	15	-	-
Cadmium as Cd	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL	0.01	-	0.01	-	-
Arsenic s As	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL	0.05	0.2	0.2	-	-
Mercury as Hg	mg/l	(<0.001) BDL	(<0.001) BDL	(<0.001) BDL	0.001	-	-	-	-
Cyanide as CN	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL	0.05	0.05	0.05	0.05	0.05
Boron as B	mg/l	(<0.1) BDL	(<0.1) BDL	(<0.1) BDL	-	-	-	-	2
DO	mg/l	7.8	7.3	7.0	6	5	4	4	-
COD	mg/l	(<5) BDL	8.3	8.3	-	-	-	-	-
BOD	mg/l	1.9	2.2	2.5	2	3	3	-	-

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Class A Drinking water source without Conventional Treatment,

Class B Outdoor Bathing,

Class C Drinking Water Source with Conventional Treatment Followed by Disinfection,

Class D Fish Culture and Wild Life Population,

Class E Irrigation, Industrial Cooling.

Regional Scenario

Ground water

- The pH limit fixed for drinking water samples as per IS 10500-2012 is 6.5 to 8.5 beyond this range the water will affect the mucus membrane and or water supply system. During study period the pH in the ground water samples was varying from **6.96 to 7.28**. The pH of all samples was falling within the acceptable limit.
- The acceptable limit for total dissolved solids as per IS 10500:2012 is 500 mg/l, whereas the permissible limit in absence of alternate source is 2000 mg/l, beyond this palatability decreases and may cause gastro intestinal irritation. In water samples collected from the study area, the total dissolved solids in groundwater are varying from **216 to 703 mg/l**. Six sample is falling within acceptable limit and two samples are falling above acceptable limit but within permissible limit.
- The acceptable limit for chloride is 250 mg/l as per IS10500:2012 whereas the permissible limit of the same is 1000 mg/l beyond this limit taste, corrosion and palatability are affected. The Chloride levels in the ground water samples collected in the study area were ranging from **16 to 74 mg/l**. All samples are falling within acceptable limit.
- The acceptable limit as per IS10500:2012 for hardness is 200mg/l whereas the permissible limit for the same is 600mg/l beyond this limit encrustation in water supply structure and adverse effects on domestic use will be observed. In the water samples collected from the study area, the hardness is varying from **144 to 388 mg/l**. All three samples are falling above the acceptable limit and five samples are falling above the acceptable limit but within permissible limits.

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Surface Water

- The pH was varying between 7.11 to 7.29. The pH values for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS: 2296-1992.
- The total dissolved solids were in the range of 122 to 156 mg/l. The TDS for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS:2296-1992.
- The chlorides were in the range of 11 to 14 mg/l, indicating that all samples were meeting the Class 'A' norms as per IS: 2296-1992.
- The total hardness is varying between 80 to 98 mg/l. n which all samples are meeting the Class 'A' norms as per IS: 2296-1992.
- DO for the all the surface water smaples varies between 7.0 to 7.8 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992.
- BOD for the all the surface water smaples varies between 1.9 to 2.5 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992.

Hence, the above analysis result of surface water quality are indicating & meets the Class 'B' norms as per IS: 2296-1992.

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3.5 Noise Environment

Noise can be defined as any undesirable sound that interferes with speech and hearing and is intense enough to damage hearing or is otherwise annoying. Noise can also disturb natural wildlife and ecological systems. Noise impacts can be a major concern during the construction and the operational phases of the project. Noise should also be considered in relation to present and future land use zoning and policies.

Construction noise can be a significant source of community noise. The impacts are felt on the people near the construction site, who are totally unrelated to construction activities (e.g. area residents, office workers, school children, staff, etc.). Factors which are important in determining noise levels that will potentially impact such populations include- distance from the noise source, natural or man-made barriers between the source and the impacted population, weather conditions which could potentially absorb, reflect or focus sound (such as wind speed, direction, temperature inversions), the scale and intensity of the particular construction phase (excavation, erection, or finishing). The Environment/ health impacts of noise can vary from Noise Induced Hearing Loss (NIHL) to annoyance depending on loudness of noise levels and tolerance levels of individuals.

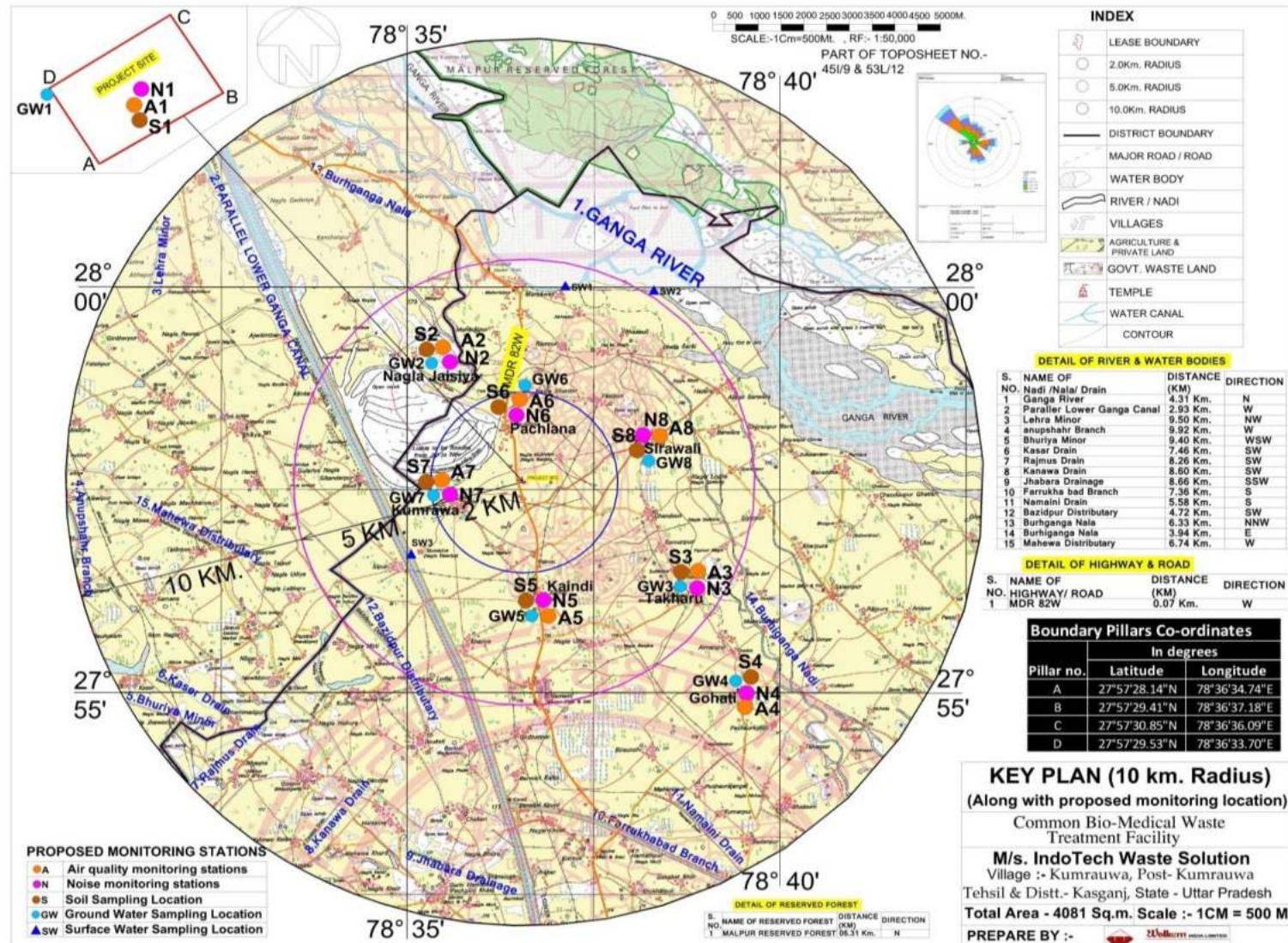
While measuring the day-night equivalent noise levels (L_{dn}), it is considered that one event at night is equivalent to ten similar events during the day time. L_{dn} is similar to 24 hours equivalent sound level (L_{Eq}) except that, during the daytime 10 dB (A) weighing is added. The L_{dn} for a given location in a community may be calculated from the hourly (L_{Eq}) equivalent sound levels with a 10 dB (A) correction added to the night time value (L_n).

Noise Levels in the Study Area

Noise levels were monitored at 8 locations within the study zone, using a noise measurement device. Random noise level measurements at various locations were carried out for assessment of existing noise levels. Keeping in view the land use pattern, residential areas, schools, bus stands, etc., the day levels of noise have been monitored during 6 AM to 10 PM and the night levels during 10 PM to 6 AM. The noise monitoring stations are shown in Table 3.13 and Figure 3.4. The results are presented in Table 3.14

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FIGURE 3.4 NOISE MONITORING LOCATIONS



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TABLE 3.13 NOISE MONITORING LOCATIONS

Code	Name of the Location	W.R.T. Site		Latitude (N)	Longitude (E)
		Distance km	Direction		
N1	Project Site	-	-	27°57'29.51"	78°36'35.05"
N2	Nagla Jaisiya	3.0	NW	27°58'49.35"	78°35'28.59"
N3	Takharu	4.5	SE	27°56'07.44"	78°38'51.68"
N4	Gohati	6.8	SE	27°55'00.33"	78°39'40.57"
N5	Kaindi	2.5	S	27°56'05.83"	78°36'45.41"
N6	Pachlana	1.4	N	27°58'14.97"	78°36'22.39"
N7	Kumraua	1.2	W	27°57'26.79"	78°35'50.36"
N8	Sirawali	2.7	ENE	27°57'56.08"	78°38'12.03"

TABLE 3.14 NOISE LEVELS IN THE STUDY AREA – DB (A)

Code	Name of the Location	Average Noise Level in dB(A)	
		Day Time	Night Time
N1	Project Site	50.6	38.7
N2	Nagla Jaisiya	52.0	39.0
N3	Takharu	52.8	37.8
N4	Gohati	52.3	36.7
N5	Kaindi	49.7	35.7
N6	Pachlana	51.9	37.0
N7	Kumraua	52.6	37.1
N8	Sirawali	50.4	36.8

Observations

The values of noise observed in some of the rural areas are primarily owing to vehicular traffic and other anthropogenic activities. In rural areas wind blowing and movements of birds would contribute to noise levels especially during the nights. The day equivalents during the study period are range between **49.7 to 52.8 dB (A)**, whereas the night equivalents were in the range of **35.7 to 39.0 dB (A)**. From the results it can be seen that the day equivalents and the Night equivalents were within the Ambient Noise standards of residential.

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3.6 Soil Quality

The study on soil quality establishes the baseline characteristics in the study area surrounding the project site. The study has been addressed with the following objectives to determine:

- The base line characteristics.
- The soil characteristics of proposed project site.
- The impact of industrialization/ urbanization on soil characteristics.
- The impacts on soils from agricultural productivity point of view

Criteria adopted for selection of sampling locations

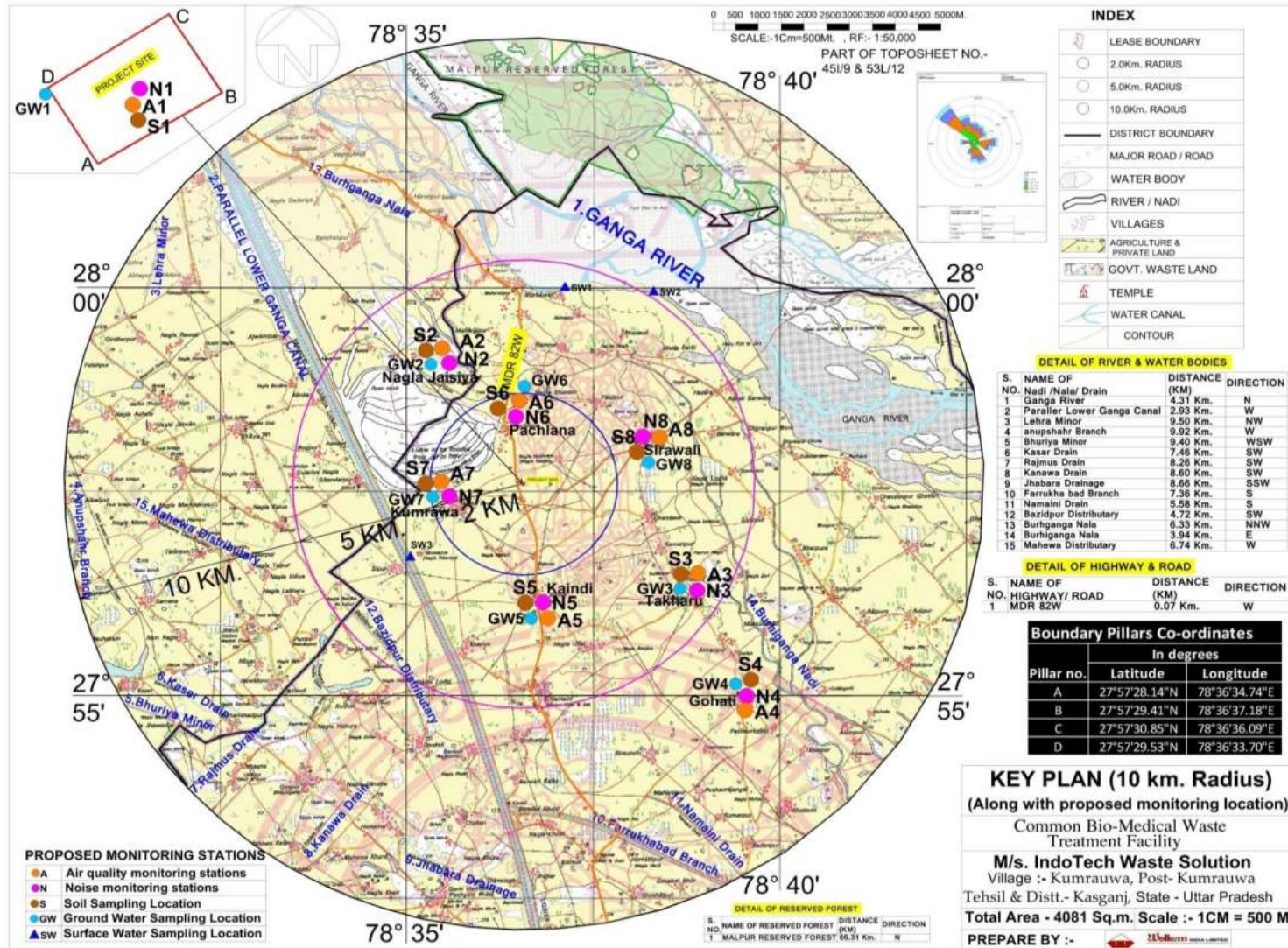
For studying the soil types and soil characteristics, 8 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features. Homogenized soil samples collected at different locations were packed in a polyethylene plastic bag and sealed. The sealed samples were sent to laboratory for analysis. Important physical and chemical parameters were determined for all samples.

TABLE 3.15 SOIL SAMPLING LOCATIONS

Code	Name of the Location	W.R.T. Site		Latitude (N)	Longitude (E)
		Distance km	Direction		
S1	Project Site	-	-	27°57'29.51"	78°36'35.05"
S2	Nagla Jaisiya	3.0	NW	27°58'49.35"	78°35'28.59"
S3	Takharu	4.2	SE	27°56'14.92"	78°38'47.76"
S4	Gohati	6.8	SE	27°55'00.33"	78°39'40.57"
S5	Kaindi	2.5	S	27°56'06.34"	78°36'45.28"
S6	Pachlana	1.4	N	27°58'15.17"	78°36'22.99"
S7	Kumraua	1.2	W	27°57'27.30"	78°35'49.81"
S8	Sirawali	2.7	ENE	27°57'56.08"	78°38'12.03"

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FIGURE 3.5 SOIL SAMPLING LOCATIONS



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TABLE 3.16 SOIL ANALYSIS REPORT

Parameter	Unit	S1	S2	S3	S4	S5	S6	S7	S8	Standard Soil Classification – (Indian Council of Agricultural Research, New Delhi)
Colour	-	brownish	yellowish brown	yellowish brown	brownish	yellowish brown	Brownish	Brownish	yellowish brown	
PH		7.98	7.76	8.02	7.69	8.56	8.12	7.95	7.88	Acidic<6.0, Normal to Saline 6.0-8.5, Tending to become Alkaline8.6 to 9.0, Alkaline above 9.
Electrical Conductivity	μS/cm	356	289	332	456	289	322	365	402	Normal<1000, Critical for germination 1000-2000, Critical for growing 2000 - 4000, Injurious to most crops>4000
Bulk Density	gm/cc	1.39	1.44	1.4	1.43	1.44	1.41	1.38	1.37	
Moisture	%	9.88	11.24	9.56	8.98	12.66	10.28	13.68	12.78	
Organic Carbon	%	0.42	0.35	0.38	0.44	0.48	0.29	0.34	0.39	Low < 0.5 , Medium 0.5 – 0.75, High >0.75
Organic Matter	%	0.72	0.60	0.65	0.75	0.82	0.50	0.58	0.68	
Calcium as Ca	mg/Kg	46.2	52.5	44.2	52	50.4	63.5	50.9	54.2	
Magnesium as Mg	mg/kg	11.6	9.68	8.4	7.5	8.8	7.76	10.04	7.2	
Available Potassium as K	kg/hac	137.6	113.3	138.4	112.0	105.7	128.9	148.3	127.0	Low below 110, Medium 110- 280 High above 280
Available Nitrogen as N	Kg/Ha	108.7	100.3	125.9	132.0	118.2	122.7	138.0	128.4	Low below 280, Medium 280-560, High above 560
Available Phosphorous as P	Kg/Ha	32.6	34.8	30.2	42.6	35.3	33.8	39.8	36.5	
Chloride	%	36.0	35.5	38.0	42.0	45.0	32.0	50.0	52.0	
Lead	Mg/kg	0.38	0.42	0.66	0.58	0.72	0.49	0.38	0.52	
Copper	%	0.42	0.46	0.55	0.49	0.58	0.76	0.68	0.57	
Zinc	Mg/kg	0.62	0.58	0.77	0.86	0.68	0.74	0.56	0.49	
Boron as B	%	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Texture	%	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	

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Parameter	Unit	S1	S2	S3	S4	S5	S6	S7	S8	Standard Soil Classification – (Indian Council of Agricultural Research, New Delhi)
		loamy	loamy	loamy	loamy	loamy	loamy	loamy	loamy	
Sand	%	60.84	60.34	60.44	60.86	60.98	60.88	60.98	60.80	
Silt	%	19.28	20.78	21.02	19.56	20.48	19.76	19.96	20.98	
Clay	%	19.88	18.88	18.54	19.58	18.54	19.36	19.06	18.22	

Observations

- The pH values in the study area are varying from **7.69 to 8.56** indicating that all soils are falling in normal to saline class.
- The electrical conductivity in the study area is varying from **289 to 456 $\mu\text{S}/\text{cm}$** indicating that all samples are falling in normal range.
- The other important parameters for characterization of soil for irrigation are N, P and K are known as primary nutrients and Ca, Mn and S as secondary nutrients. The primary and secondary nutrients are known as major elements. The classification is based on their relative abundance, and not on their relative importance.
- The available potassium in the study area is varying between **105.7 to 148.3 Kg/Ha** indicating that all samples are falling in medium range except one sample which is falling in Low range.

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3.7 Biological Environment

Introduction: The study of biological environment is one of the most important aspects of EIA & EMP report. The biological communities are good indicators of climatic and edaphic factors. EIA and EMP helps to identify the major and minor impact on the ecosystem and warns to check the major and minor impacts due to proposed Common Bio-medical Waste Treatment Facility activities. Therefore, the present study is proposed to assess the major and minor impacts of the M/s Indo Tech Waste Solution, Khasra No- 1161 Village Kumroua, Block- Saron Tehsil & District Kasganj , State Uttar Pradesh.

The list of flora & fauna species has been prepared with the help of Forest Department, Kasganj (CF, ACF, Range officer and field staff). The data were also collected on vernacular and ethno botanical aspects, as in practice by local inhabitants.

Objectives: The local flora & fauna of study area have been conducted to fully appreciate the ecological status of the existing flora and fauna to generate baseline information and correlation with secondary data, monitoring arrangement on the 10 Km radius along with evaluation of the probable major and minor impacts along with mitigation measures was made.

Methodology for Flora and Fauna Survey

- To have an inventory and details of vegetation found in the study area.
- To analyze the existing vegetation in order to ascertain future ecological balance of the area.
- Generation of primary data by undertaking systematic ecological studies in the area.
- Gathering data for ethno-biology.
- Preparation of an inventory of the terrestrial fauna inhabiting in the study area.
- Assessment of the existing status of endangered, endemic, threatened, and rare species in 10.0 Km radius of the area.
- Identification of components of the food chain & food web in the study area.

The biological study of terrestrial flora, fauna and aquatic biota has been carried with an aim to establish different transects in the 10 K.M radius. An insight of terrestrial fauna was carried out to gain required knowledge about species of carnivores, ungulates, non-human primates, birds, reptiles and invertebrates etc.

Equipment/Material used:

Digital camera, GPS, Brunton Compass, Magnifying Glass, Hammer, Sample bag, Binocular, Rope, ballpoint pen, field notebook, etc.

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Study of flora & fauna in Core & Buffer zone:

The Ecological and biodiversity survey has been conducted during 1st March 2021 to 31st May, 2021, Pre-Monsoon season in the core & buffer zone.

Methodology Adopted for Generic & Specific Flora Study

Flora: The present study on the floral assessment for the proposed project activity is based on extensive field survey of the area. The study has been conducted in pre monsoon season, 2021. The local flora was identified by their morphological observation, such as its size and shape of the leaf, flowers, fruits and their bark features of stem and also documented their habitat viz. Trees, Shrubs, Herbs, Grasses and Climbers etc with the help of secondary sources like degree colleges and forest department. The plants which were not identified at field were collected, brought to the laboratory and identified using standard reference books and internet. Photo documentation of some of the key species present the study area was also done. Besides the collection of plant species, information was also collected with vernacular names of plant species made by local inhabitants. In this process the whole study area was divided into different sections to get the maximum diversity of plant species. The sampling sites were selected based on land use pattern, topography and floristic composition of the study area. Data on forest type, legal status and their extent in the study area has been collected from forest department. The other relevant data on biodiversity, economically important plant species and medicinal plant, rare and endangered species in the study area have been collected during site visit and from different secondary sources.

Fauna: For the baseline status of different faunal classes were done by following techniques. The study of fauna takes substantial amount of time to understand the specific faunal characteristics of the area. The assessment of fauna has been done by extensive field survey of the area. During survey, Line Transect method was used for the study of mammals and Transact & Patch sampling was used for Amphibians. In addition the following sources were also used during survey.

- Sighting during ecological studies
- Animal call
- Foot mark and excreta

During survey, the presence of wildlife was also confirmed from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area which was later confirmed from different government offices like forest department, wildlife department etc.

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Mammals: Presence of mammals was documented by using both direct and indirect evidence. Opportunistic sightings were also included. Transect line were used to search indirect evidence i.e. animal burrows / holes, scat, pellets, feeding signs, and tracks. Photographic (colored pictorial guide) field guide were used for interviews with local residents (Burnham et al. 1980; Rodgers 1991; Sale and Berkmuller, 1988 & Daniel, 1992)

Avifauna: During Birds survey actual counts of birds were made with standard survey technique. Observations were made during a walk through in the chosen to transect for sighting birds. The number of birds observed in each sampling location was directly counted & listed. Birds were noted, counted & identified with the help of 8X40 “Optima Zenith” binocular & standard field identification guides. Identification by calls was also made for species identification which was not directly encountered or was hidden in the vegetation/canopy (Sridharan, 1989; Bhupathy, 1991; Bibby et al., 1992 & Hutto et al., 1986).

Herpetofauna: The 10-meter radius size circular plot was used for the investigation of reptiles and amphibians. In an area search for investigation also involve turning cover objects like logs, boulders etc. (Welsh, 1987) within the plot area. Sampling for these species involved through binoculars and aural surveys.

Assessment of Rare, Endangered and threatened Flora and Fauna: As per the Wildlife Protection Act, 1972 and their subsequent amendments, schedule category for wild plant and animals also consider for assessing the sensitive species. The scheduled species are given for the assessment of the any available sensitive species. This Act is enacted for protection of plants and animal species. It has six schedules which give varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection - offences under these are prescribed the highest penalties. Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower. Schedule V includes the animals which may be hunted. The plants in Schedule VI are prohibited from cultivation and planting. The hunting to the enforcement authorities have the power to compound offences under this Schedule (i.e. they impose fines on the offenders).

A Brief Overview of Forestry Scenario

As per the Champion & Seth Classification of Forest Types (1968), the forests in Uttar Pradesh belong to five Forest Type Groups, which are further divided into 28 Forest Types. In recent years, massive plantation programmes have been taken up in the State to increase the forest & tree cover. Through the Nursery Management Scheme, the tall saplings of 8 to 12 feet height are also

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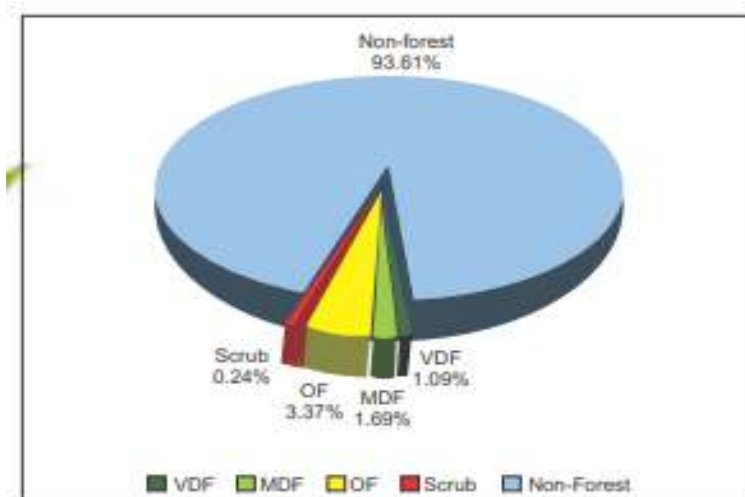
being raised for planting. During the plantation season of 2019 more than 22.5 crores saplings were planted across the State under the Vriksha Mahakhumbh Programme. To promote tree plantations outside the forest areas, improve livelihoods and enhance income of the farmers, the State Government has exempted most of the trees species from felling and transit rules. Recorded Forest Area (RFA) in the State is 16,582 sq km of which 12,070 sq km is Reserved Forest, 1,157 sq km is Protected Forest and 3,355 sq km is Unclassed Forests. In Uttar Pradesh, during the period 1st January 2015 to 5th February 2019, a total of 163.76 hectares of forest land was diverted for non-forestry purposes under the Forest Conservation Act, 1980 (MoEF& CC, 2019). One National Park and 26 Wildlife Sanctuaries constitute the Protected Area network of the State covering 11.82% of its geographical area. Dudhwa National Park located in the State is known for successful translocation of one horned rhinoceros.

Forest Area:- Based on the interpretation of IRS Resourcesat-2 LISS III satellite data of the period Oct 2017 to Jan 2018, the Forest cover in the State is 14,805.65 sq km which is 6.15 % of the State's geographical area. In terms of forest canopy density classes, the State has 2,616.43 sq km under Very Dense Forest (VDF), 4,080.04 sq km under Moderately Dense Forest (MDF) and 8,109.18 sq km under Open Forest (OF). Forest Cover in the State has increased by 126.65 sq km as compared to the previous assessment reported in ISFR 2017.

TABLE 3.17 FOREST COVER OF UTTAR PRADESH (in Sq.Km)

Class	Cover	% of G.A
Very Dense Forest (VDF)	2,616.43	1.09
Moderately Dense Forest (MDF)	4,080.04	1.69
Open Forest (OF)	8,109.18	3.37
Total	14805.65	6.15
Scrub	586.52	0.24

FIGURE 3.6: FOREST COVER OF UTTAR PRADESH (in Sq.Km)

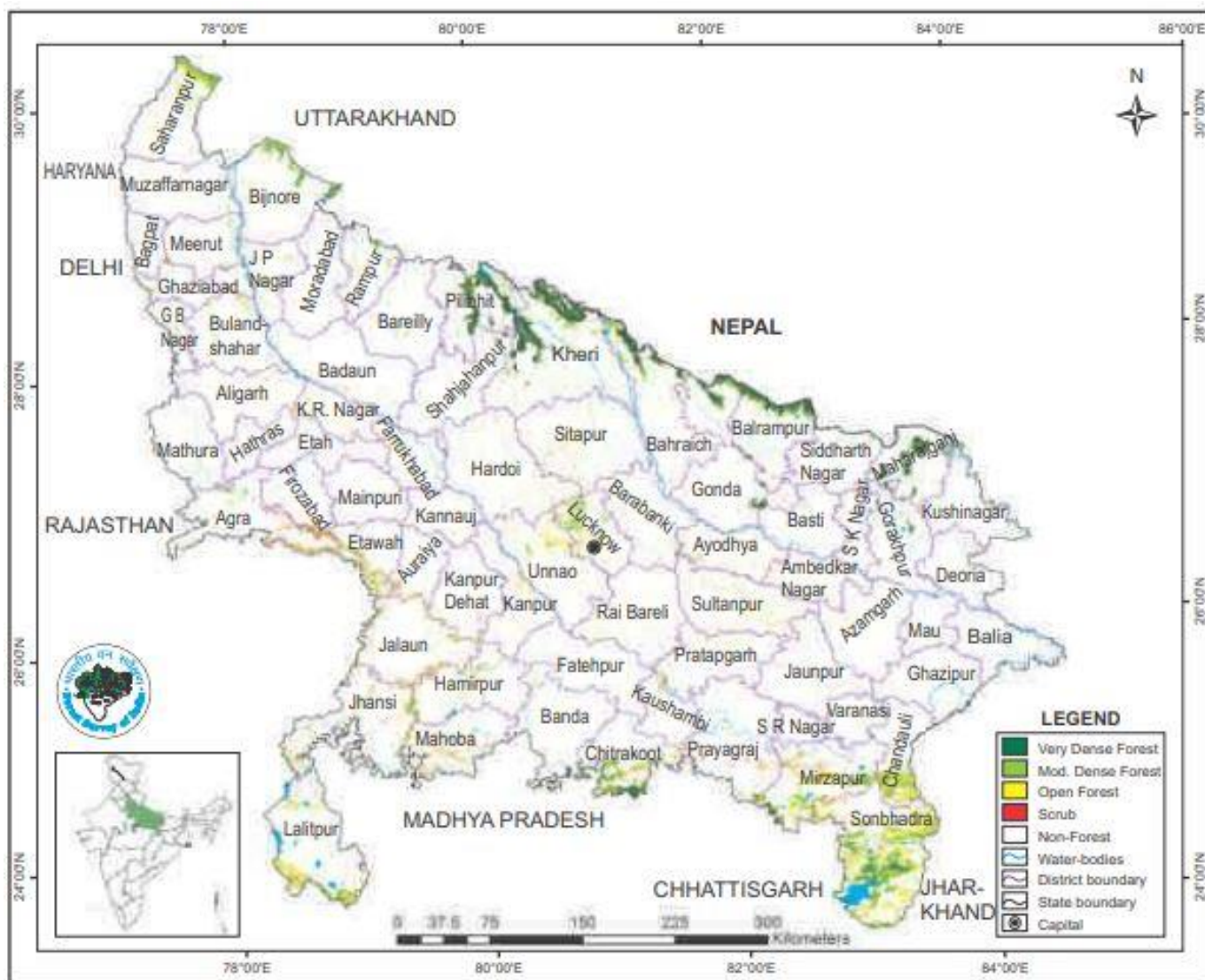


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TABLE 3.18 KANSHIRAM NAGAR FOREST COVER (in Sq. Km)

Name of District	Geo. Area in Sp. Km.	Very dense forest	Mod. Dense forest	Open forest	Total	% GA	Change	Scrub
Kanshiram Nagar	1955	0	7.67	41.13	48.80	2.5	-19.2	0

FIGURE 3.7: MAP SHOWING FOREST TYPES OF UTTAR PRADESH



The natural vegetation present within 10 K.M radius of the project site is in the form of Trees, shrubs, herbs, grasses and climbers. Most of the vegetative areas are present along canal banks/bunds, roadsides and village. Dominant species are mostly of trees like Poplar, hybrid Eucalyptus, Mango, Arjun, Neem, Shisham, Siris, Semal, Teak and Babool. Shrubs like Aak, Bhang, along with grasses like Munj, Pawar, Kans, Patera, and Guner are naturally growing in the area.

Flora of the Core Zone :- The core zone are is only 4081 Sq.m, In the core zone no trees and shrubs

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and herbs available . The area is fully agriculture. Mainly three crops are growing e.g Wheat, Groundnut and Bajar, chiily, Bhindi and palak etc

TABLE 3.19 LIST OF FLORAL IN THE BUFFER ZONE

S. No.	Local name	Scientific Name	Family
1.	Khair	<i>Acacia catechu</i>	Mimosaceae
2.	Riyonj	<i>Acacia leucophloea</i>	Mimosaceae
3.	Babul	<i>Acacia nilotica</i>	Mimosaceae
4.	Bel	<i>Aegle marmelos</i>	Rutaceae
5.	Siris	<i>Albizia lebbek</i>	Mimosaceae
6.	Kadam	<i>Anthocephalus cadamba</i>	Rubiaceae
7.	Kathal	<i>Artocarpus heterophyllus</i>	Moraceae
8.	Neem	<i>Azadirachta indica</i>	Meliaceae
9.	Kachnar	<i>Bauhinia variegata</i>	Fabaceae
10.	Semal	<i>Bombax cieba</i>	Malvaceae
11.	Amaltash	<i>Cassia fistula</i>	Fabaceae
12.	Neembu	<i>Citrus aurantifolia</i>	Rutaceae
13.	Shisham	<i>Dalbergia sissoo</i>	Fabaceae
14.	Gulmohar	<i>Delonix regia</i>	Caesalpinaceae
15.	Amla	<i>Emblica officinalis</i>	Euphorbiaceae
16.	Eucalyptus	<i>Eucalyptus hybrid</i>	Myrtaceae
17.	Bargad	<i>Ficus bengalensis</i>	Moraceae
18.	Anjeer	<i>Ficus carica</i>	Moraceae
19.	Khemri	<i>Ficus palmata</i>	Moraceae
20.	Peepal	<i>Ficus religiosa</i>	Moraceae
21.	Falsa	<i>Grewia asiatica</i>	Tiliaceae
22.	Kanju	<i>Holoptelea integrifolia</i>	Ulmaceae
23.	Subabul	<i>Leucaena leucocephala</i>	Mimosaceae
24.	Aam	<i>Mangifera indica</i>	Anacardiaceae
25.	Bakain	<i>Melia azaderach</i>	Meliaceae
41.	Karanj	<i>Millettia pinnata</i>	Fabaceae
26.	Shahtoot	<i>Morus alba</i>	Moraceae
27.	Khajoor	<i>Phoenix sylvestris</i>	Arecaceae
28.	Ashok	<i>Polyalthia longifolia</i>	Lauraceae
29.	Poplar	<i>Populus spp</i>	Salicaceae
30.	Chaunkar	<i>Prosopis cineraria</i>	Mimosaceae
31.	Bilayati babool	<i>Prosopis juliflora</i>	Mimosaceae
32.	Amrud	<i>Psidium guajava</i>	Myrtaceae
33.	Kusum	<i>Schleicher oleosa</i>	Hippocastanaceae
34.	Katera	<i>Solanum surrattense</i>	Solanaceae
35.	Jamun	<i>Syzygium cumini</i>	Myrtaceae

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36.	Sawan	<i>Tectona grandis</i>	Verbenaceae
37.	Arjun	<i>Terminalia arjuna</i>	Combretaceae
38.	Ber	<i>Zizipus jujuba</i>	Rhamnaceae

TABLE 3.20 SHRUB SPECIES RECORDED FROM STUDY AREA

S. No.	Local name	Scientific Name	Family
1.	Aak	<i>Calotropis procera</i>	Asclepiadaceae
2.	Bhang	<i>Canabis indica</i>	Cannabaceae
3.	Kareel	<i>Capparis deciduas</i>	Capparaceae
4.	Chakunda	<i>Cassia occidentalis</i>	Caesalpiniaceae
5.	Pawar	<i>Cassia tora</i>	Caesalpiniaceae
6.	Datura	<i>Datura spp</i>	Solanaceae
7.	Bans	<i>Dendrocalamus strictus</i>	Poaceae
8.	Kairi	<i>Dichrostachys cinerea</i>	Mimosaceae
9.	Kataiya	<i>Flacourtia indica</i>	Flacourtiaceae
10.	Gudhal	<i>Hibiscus rosasinensis</i>	Malvaceae
11.	Kuri	<i>Lantana camara</i>	Verbenaceae
12.	Jatropha	<i>Ricinus communis</i>	Euphorbiaceae
13.	Dhaicha	<i>Sesbania sesban</i>	Fabeaceae
14.	-	<i>Solanum xanthocarpum</i>	Solanaceae
15.	Barseem	<i>Trifolium alexandrinum</i>	Fabeaceae
16.	Mola	<i>Vitex negundo</i>	Verbenaceae
17.	Cocklebur	<i>Xanthium strumarium</i>	Asteraceae
18.	Jharberi	<i>Ziziphus mauritiana</i>	Rhamnaceae
19.	Ber	<i>Ziziphus nummularia</i>	Rhamnaceae

TABLE 3.21 HERB SPECIES RECORDED FROM STUDY AREA

Sl. No.	Local name	Scientific Name	Family
1	Ghonghchi	<i>Abrus precatorius</i>	Fabaceae
2.	Kakai	<i>Abutilon indicum</i>	Malvaceae
3	Kuchi	<i>Acacia pennata</i>	Mimosaceae
4	Latjeera	<i>Achyranthes aspera</i>	Amerenthaceae
5	Rambans	<i>Agave americana</i>	Agavaceae
6	Phulenda	<i>Ageratum conyzoides</i>	Asteraceae
7	Dhikwar	<i>Aloe vera</i>	Asphodelaceae
8	Jungle Chaulai	<i>Amaranthus viridis</i>	Amerenthaceae
9	Gaigrwa	<i>Andropogon punilus</i>	Poaceae
10	Bhajuri	<i>Apluda mutica</i>	Poaceae
11	Peeli kateli	<i>Argemone mexicana</i>	Papaveraceae
12	Satavar	<i>Asparagus racemosus</i>	Asparagaceae
13	Sarso	<i>Brassica campestris</i>	Brassicaceae
14	Musk Melon	<i>Cucumis melo</i>	Cucurbitaceae

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15	Kheera	<i>Cucumis sativus</i>	Cucurbitaceae
16	Amarbel	<i>Cuscuta reflexa</i>	Cuscutaceae
17	Dub	<i>Cynodon dactylon</i>	Poaceae
18	Nagar Motha	<i>Cyperus rotundus</i>	Poaceae
19	Makra	<i>Dactyloctenium aegyptium</i>	Poaceae
20	Jalkumbhi	<i>Eichhornia crassipes</i>	Pontederiaceae
21	Dudhee	<i>Euphorbia hirta</i>	Euphorbiaceae
22	Gumma	<i>Leucas sp</i>	Lamiaceae
23	Tomato	<i>Lycopersicon lycopersicum</i>	Solanaceae
24	Bilpat	<i>Melochia corchorifolia</i>	Malvaceae
25	Kamal	<i>Nelumbo nucifera</i>	Nelumbonaceae
26	Tulsi	<i>Ocimum sanctum</i>	Lamiaceae
27	Pitpapra	<i>Oldenlandia corymbosa</i>	Rubiaceae
28	Amrul	<i>Oxalis corniculata</i>	Oxalidaceae
29	Gajar Ghas	<i>Parthenium hysterophorus</i>	Asteraceae
30	Pacholi	<i>Pogostemon bengalensis</i>	Lamiaceae
31	Knot Weed	<i>Polygonum sp</i>	Polygonaceae
32	Jungle palak	<i>Rumex sp.</i>	Polygonaceae
33	Munj	<i>Saccharum munja</i>	Poaceae
34	Sugarcane	<i>Saccharum officinarum</i>	Poaceae
35	Kans	<i>Saccharum spontaneum</i>	Poaceae
36	Bhatkataya	<i>Solanum indicum</i>	Solanaceae
37	Makoy	<i>Solanum nigrum</i>	Solanaceae

Sl. No.	Local name	Scientific Name	Family
1	Amarbel	<i>Cuscuta reflexa</i>	Convolvulaceae
2	Ramdatun	<i>Smilax macrophylla</i>	Smilacaceae
3	Biswal	<i>Acacia pennata</i>	Mimosaceae
4	Geloy	<i>Tinospora cordifolia</i>	Menispermaceae

Sl. No.	Local name	Scientific Name	Family
1	Dhoob	<i>Cynodon dactylon</i>	Poaceae
2.	Bristle grass	<i>Aristida adscensionis</i>	Poaceae
3.	Sheda grass	<i>Dichanthium annulatum</i>	Poaceae
4.	Anjan	<i>Cenchrus ciliaris</i>	Poaceae
5	Dib	<i>Desmostachya bipinnara</i>	Poaceae
6.	Kans	<i>Saccharum spontaneum</i>	Poaceae
1.	Jal Kumbhi	<i>Eichhornia crassipes</i>	Pontederiaceae

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FIGURE 3.8: PROJECT PHOTOGRAPHS**PROJECT PHOTOGRAPHS***Calotropis procera* (AaK)*Ficus bengalensis* (Bargad)*Prosopis juliflora*

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Fauna: A baseline survey had been conducted to document the faunal biodiversity of the study area with respect to birds, reptiles, amphibians and butterfly species. Fauna is a gift of nature, and the different beasts and birds, forming part of wild life, need to be preserved. The wild animal and birds help in protecting crops, by preying upon worms and insects, which might damage them. The Wild Life Protection Act, 1972 (Government of India) is now applicable.

TABLE 3.22 LIST OF FAUNA IN THE STUDY AREA

S. No	Common Name	Zoological Name	Order	Family	Schedule
A	Mammals				
1	Indian Hare	<i>Lepus nigricollis</i>	Lagomorpha	Leporidae	IV
2	Five striped palm squirrel	<i>Funambulus pennanti</i>	Rodentia	Sciuridae	IV
3	Common House rat	<i>Rattus rattus</i>	Rodentia	Muridae	IV
4	Indian Grey Mongoose	<i>Herpestes edwardsi</i>	Carnivora	Herpestidae	II
5	Indian fox	<i>Vulpes bengalensis</i>	Carnivora	Canidae	II
6	Bat (Indian Flying fox)	<i>Pteropus gigantius</i>	Chiroptera	Pteropodidae	IV
7	Monkey	Rhesus macaque	Primates	Cercopithecidae	II
8	Blue Bull	<i>Boselaphus tragocamelus</i>	Artiodactyla	Bovidae	IV
9	Porcupine	<i>Hystrix indica</i>	Rodentia	Hystriidae	IV
10	Wild Boar	<i>Sus scrofa</i>	Artiodactyla	Suidae	III
11	Greater yellow house bat	<i>Scotophilus heathii</i>	Chiroptera	Vespertilionidae	NL
12	Mouse	<i>Vandeleuria oleraceae</i>	Rodentia	Muridae	V
B	Birds				
1	House sparrow	<i>Passer domesticus</i>	Passeriformes	Passeridae	IV
2	Common bulbul	<i>Pycnonotus barbatus</i>	Passeriformes	Pycnonotidae	IV
3	House crow	<i>Corvus splendens</i>	Passeriformes	Corvidae	V
4	Common Myna	<i>Acridotheres tristis</i>	Passeriformes	Sturnidae	IV
5	Rose-ringed Parakeet	<i>Psittacula krameri</i>	Psittaciformes	Psittacidae	IV
6	Indian Ring Dove	<i>Streptopelia decaocto</i>	Columbiformes	Columbidae	IV
7	Pigeon	<i>Columba livia</i>	Columbiformes	Columbidae	IV
8	Jungle hen	<i>Gallus gallus</i>	Galliformes	Phasianidae	IV
9	Indian Grey Hornbill	<i>Ocyrceros birostris</i>	Bucerotiformes	Bucerotidae	IV
10	Indian Roller	<i>Coracias benghalensis</i>	Coraciiformes	Coraciidae	IV

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S. No	Common Name	Zoological Name	Order	Family	Schedule
11	Indian Jungle crow	<i>Corvus macrorhynchos culminatus</i>	Passeriformes	Corvidae	V
12	Drongo	<i>Dicrurus bracteatus</i>	Dicruridae	Passeriformes	IV
13	Common babbler	<i>Turdoides caudate</i>	Passeriformes	Leiothrichidae	IV
14	Cattle Egret	<i>Bubulcus ibis</i>	Pelecaniformes	Ardeidae	IV
15	Little Egret	<i>Egretta garzetta</i>	Pelecaniformes	Ardeidae	IV
16	Indian pond heron	<i>Ardeola grayii</i>	Pelecaniformes	Ardeidae	IV
17	Owl	<i>Bubo bubo</i>	Strigiformes	Strigidae	IV
18	Baya	<i>Ploceus philippinus</i>	Passeriformes	Ploceidae	IV
19	Red-vented bulbul	<i>Pycnonotus cafer</i>	Passeriformes	Pycnonotidae	IV
20	Little grebe	<i>Tachybaptus ruficollis</i>	Podicipediformes	Podicipedidae	IV
21	Little Cormorant	<i>Microcarbo niger</i>	Suliformes	Phalacrocoracidae	IV
22	Great cormorant	<i>Phalacrocorax carbo</i>	Suliformes	Phalacrocoracidae	IV
23	Oriental darter	<i>Anhinga melanogaster</i>	Suliformes	Anhingidae	IV
24	<i>Coturnix coturnix</i>	Common Quail	Galliformes	Phasianidae	IV
25	Grey heron	<i>Ardea cinerea</i>	Pelecaniformes	Ardeidae	IV
26	Striated heron	<i>Butorides striata</i>	Pelecaniformes	Ardeidae	IV
27	Great egret	<i>Ardea alba</i>	Pelecaniformes	Ardeidae	IV
28	Black Drongo	<i>Dicrurus macrocercus</i>	Passeriformes	Dicruridae	IV
29	Common Crane	<i>Grus grus</i>	Gruiformes	Gruidae	IV
30	White-breasted waterhen	<i>Amaurornis phoenicurus</i>	Gruiformes	Rallidae	IV
31	Common moorhen	<i>Gallinula chloropus</i>	Gruiformes	Rallidae	IV
32	Red-wattled lapwing	<i>Vanellus indicus</i>	Shorebirds	Charadriidae	IV
33	Little ringed plover	<i>Charadrius dubius</i>	Charadriiformes	Charadriidae	IV
34	Common redshank	<i>Tringa tetanus</i>	Charadriiformes	Scolopacidae	IV
35	Asian koel	<i>Eudynamis scolopaceus</i>	Cuculiformes		IV
36	Common kingfisher	<i>Alcedo atthis</i>	Coraciiformes	Alcedinidae	IV
37	White-throated kingfisher	<i>Halcyon smyrnensis</i>	Coraciiformes	Alcedinidae	IV
38	Common Hawk Cuckoo	<i>Hierococcyx varius</i>	Cuculiformes	Cuculidae	IV
39	Brown-headed	<i>Megalaima zeylanica</i>	Piciformes	Megalaimidae	IV

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S. No	Common Name	Zoological Name	Order	Family	Schedule
	Barbet				
40	Common Tailor Bird	<i>Orthotomus sutorius</i>	Passeriformes	Cisticolidae	IV
41	Oriental Honey Buzzard	<i>Pernis ptilorhynchus</i>	Accipitriformes	Accipitridae	IV
42	Oriental Turtle Dove	<i>Streptopelia orientalis</i>	Columbiformes	Columbidae	IV
43	Common Barn Owl	<i>Tyto alba</i>	Strigiformes	Tytonidae	IV
C	AMPHIBIAN				
1	Common frog	<i>Rana temporaria</i>	Anura	Ranidae	-
2	India bull frog	<i>Hoplobatrachus tigerinus</i>	Anura	Dicroglossidae	IV
3	Common Indian Toad	<i>Bufo melanostictus</i>	Anura	Bufo	LC
D	REPTILES				
1	Garden lizard	<i>Calotes versicolor</i>	Squamata	Agamidae	IV
2	House lizard	<i>Hemidactylus frenatus</i>	Squamata	Gekkonidae	IV
3	Nevala	<i>Herpestes smithi</i>	Carnivora	Herpestidae	III
4	Indian chameleon	<i>Chamaeleo zeylanicus</i>	Squamata	Chamaeleonidae	LC
5	Common House Gecko	<i>Hemidactylus flaviviridis</i>	Squamata	Gekkonidae	NA
6	Dhaman	<i>Ptyas mucosus</i>	Squamata	Colubridae	NA
7	Naag	<i>Naja naja</i>	Squamata	Elapidae	LC
	Butterflies				
1	Common Grass Yellow	<i>Eurema hecabe</i>	Lepidoptera	Pieridae	Common
2	Common Leopard	<i>Phalantha phalantha</i>	Lepidoptera	Nymphalidae	Fairly Common
3	Lemon Pansy	<i>Junonia lemonias</i>	Lepidoptera	Nymphalidae	Common
4	Great Egg fly	<i>Hypolimnas bolina</i>	Lepidoptera	Nymphalidae	Common
5	Common Castor	<i>Ariadne merione</i>	Lepidoptera	Nymphalidae	Common
6	Plain tiger	<i>Danaus chrysippus</i>	Lepidoptera	Nymphalidae	Common
7	Danaid Egg fly	<i>Hypolimnas misippus</i>	Lepidoptera	Nymphalidae	Common

Endemic Fauna of the Study Area

As per list of The Indian Wildlife (Protection) Act, 1972, Fauna coming under the schedule – I is treated as endangered species. As per reconnaissance survey no schedule – I faunal species have been reported from the 10 K.M radius area. Although schedule-II,III,IV,V species have been reported during the site survey, which are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wild life.

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FIGURE 3.9: PHOTOGRAPHS OF AVIFAUNA/BUTTERFLY IN BUFFER ZONE

	
<i>Ardeola grayii</i>(Indian pond heron)	<i>Danaus chrysippus</i> (Plain Tiger)
	
<i>Red-wattled lapwing</i>	

Observation & Result

There is no National parks, Sanctuaries, Biosphere Reserves, Wildlife corridors, Tiger/Elephant reserves (existing as well as proposed), within 10 km of the area. We have collected secondary data for seasonality data of whole year and analysis of primary data. It discussed with forest experts, field staff and locals persons. FGD's has been done for verification of secondary data along with concerned officials of Forest Department.

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Cropping pattern in U.P

The soils in the region falling under Agro-climatic zone IV are alluvium-derived soils mostly khaddar (recent alluvium) and hangar (old alluvium). In some area the soil is highly calcareous. The soils are loamy and high in organic matter content. Rice, maize, pigeon pea, moong bean crops are common in kharif season. In post-rainy (rabi) season wheat, lentil, Bengal gram, pea, and sesame and at some places groundnut is grown on residual soil moisture with one or two supplemental irrigation. The important cash crops of the region are sugarcane, potato, tobacco, chillies, turmeric and coriander with supplemental irrigation. Rice–wheat cropping system is more predominant.

The dominant soil landscapes, representing the northern plains, constitute gently to very gently sloping lands. In some area the soil is highly calcareous. The soils in general are neutral in reaction and have moderate clay and low organic carbon content. Traditionally rain fed and irrigated agriculture is common. The main crops grown are rice, maize, pigeon pea, sorghum, pearl millet, moong beans during kharif and wheat, Bengal gram, green peas, rapeseed and mustard and lentil during rabi season. Sugarcane is the main cash crop. Rice–wheat cropping system is more predominant.

TABLE 3.23 AGRICULTURE CROPS GROWN IN THE STUDY AREA

S. No	Local Name	Botanical Name	Family
	Crop		
1	Wheat	<i>Triticum aestivum</i>	Poaceae
2	Maize	<i>Zea mays</i>	Poaceae
3	Mustard (Rai)	<i>Brassica juncea</i>	Brassicaceae
4	Sugar cane	<i>Saccharum officinarum</i>	Poaceae
5	Rice	<i>Oryza sativa</i>	Poaceae
6	Bajra	<i>Cenchrus americanus</i>	Poaceae
7	Jowar	<i>Sorghum spp</i>	Poaceae
8	Ground nut	<i>Arachis hypogaea</i>	Fabaceae
	Vegetables		
1	Bhindi	<i>Abelmoschus esculentus</i>	Malvaceae
2	Tomato	<i>Solanum lycopersicum</i>	Solanaceae
3	Cauliflower	<i>Brassica oleracea</i>	Brassicaceae
4	Palak	<i>Spinacia oleracea</i>	amaranthaceae,
5	Dhania	<i>Coriandrum sativum</i>	Apiaceae
6	Muli	<i>Raphanus sativus</i>	Brassicaceae
7	Chilly	<i>Capsicum annum</i>	Solanaceae
	Fruits		
1	Lemon	<i>Citrus limon</i>	Rutaceae
2	Guava	<i>Psidium guajava</i>	Myrtaceae
3	Papaya	<i>Carica papaya</i>	Caricaceae
4	Banana	<i>Musa paradisiacal</i>	Musaceae

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5	Annar	<i>Punica granatum</i>	Lythraceae
6	Aam	<i>Mangifera indica</i>	Anacardiaceae
	Pulses		
1	Urad	<i>Vigna mungo</i>	Fabaceae
2	Pigeon pea	<i>Cajanus cajan</i>	Fabaceae
3	Chanda Dal	<i>Cicer arietinum</i>	Fabaceae

Source: Field Survey and discussion with local villagers.

Methodology of Aquatic Ecology

The sampling was carried out for Ganga River Biological characteristics that were assessed include zooplankton, phytoplankton, and benthos & fish diversity. specific methodology in respect to aquatic ecology is given below.

Phytoplankton: For the study of phytoplankton, samples were collected from 10 cm depth below the water surface. Fresh Polythene bottles of 125 ml capacity (Polylab) were used for collection of water samples. After the sampling, the sample was preserved by adding Lugol's solution.

Zooplankton: For the quantification of zooplankton samples, 20 liters of sample water was filtered at each site by using standard plankton net made up of fine silk cloth (mesh size 25 µm). After the sampling, the preservation of samples was carried out without delay to avoid damage to animal tissue by bacterial action. The collected filtrate was preserved in the 4% formalin solution (Analytical grade). The density of zooplankton was estimated with the help of APHA (2012). After preservation the zooplankton samples were kept in well-ventilated room at temperature less than 25°C. The samples were kept in the wide mouth bottle. A good quality preprinted labels were used, on which date and time of sampling, fixative and preservative used and other field information were written for ready reference at the time of analysis.

TABLE 3.24 LIST OF PHYTO PLANKTONS FROM STUDY AREA

S.No	Scientific Name	Family
1	<i>Anabaena variabilis</i>	Nostocaceae
2	<i>Cladophora Sp.</i>	Cladophoraceae
3	Cyclotella	Stephanodiscaceae
4	<i>Navicula</i>	Naviculaceae
5	<i>Euglena Sp.</i>	Euglenaceae
6	<i>Nostoc communae</i>	Nostocaceae
7	<i>Oedogonium Sp.</i>	Oedogoniaceae
8	<i>Oscillatoria Sp.</i>	Oscillatoriaceae
9	<i>Volvox Sp.</i>	Volvocaceae
10	Scenedesmus sp.	Scenedesmaceae
11	Chlorella	Chlorellaceae
13	Closterium	Closteriaceae
14	Microsystis	Microcystaceae

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TABLE 3.25 LIST OF ZOOPLANKTONS FROM STUDY AREA

S.No	Scientific Name	Family
1	<i>Arcella Sp.</i>	Arcellidae
2	<i>Brachionus Sp.</i>	Brachionidae
3	<i>Cyclops Sp.</i>	Cyclopidae
4	<i>Daphnia sp.</i>	Daphniidae
5	<i>Lecane Sp.</i>	Lecanidae
6	<i>Mesocyclops</i>	Cyclopidae
7	<i>Actinophrys sp.</i>	Actinophryidae
8	<i>Monostyla</i>	Lecanidae

Fish: Fish samples were collected from different habitats such as Rivers, Dams and Village ponds. For fish collection Cast Net, Mosquito net and locally available fishing pole were used. After sample collection, fish were examined, and released back into the system. For unidentified species, some fish samples were preserved in formalin solution (30%) and transported for species confirmation. Species identification and confirmation were carried out using available literature, books and pictorial guides. At each sampling site, a set of the following environmental variables were recorded: Water source, stream order, altitude, stream width (m) approx. and water depth (cm).

TABLE 3.26 LIST OF FISH FAUNA RECORDED IN THE STUDY AREA

S.No.	Name	Scientific Name	Order	Family	IUCN status
1.	Catla	<i>Catla catla</i>	Cypriniformes	Cyprinidae	LC
2.	Nain	<i>Cirrhinus mrigala</i>	Cypriniformes	Cyprinidae	LC
3.	Mangur	<i>Clarias batrachus</i>	Siluriformes	Clariidae	LC
4.	Vacha	<i>Eutropiichthys vacha</i>	Siluriformes	Schilbeidae	LC
5.	Singhi	<i>Heteropneustes fossilis</i>	Siluriformes	Schilbeidae	LC
6.	Rohu	<i>Labeo rohita</i>	Cypriniformes	Cyprinidae	LC
7.	Tengra	<i>Mystus seenghala</i>	Siluriformes	Bagridae	LC
8	Ganges River Gizzard Shad	<i>Gonialosa manmina</i>	Clupeiformes	Clupeidae	LC
9	Cat fish	<i>Mystus cavasius</i>	Siluriformes	Bagridae	LC
10	Reba Carp	<i>Cirrhinus reba</i>	Cypriniformes	Cyprinidae	LC

Plantation - 33 % plantation will be developed in the plant area as per forest department and UPPCB.

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3.8 Land Use Land Cover

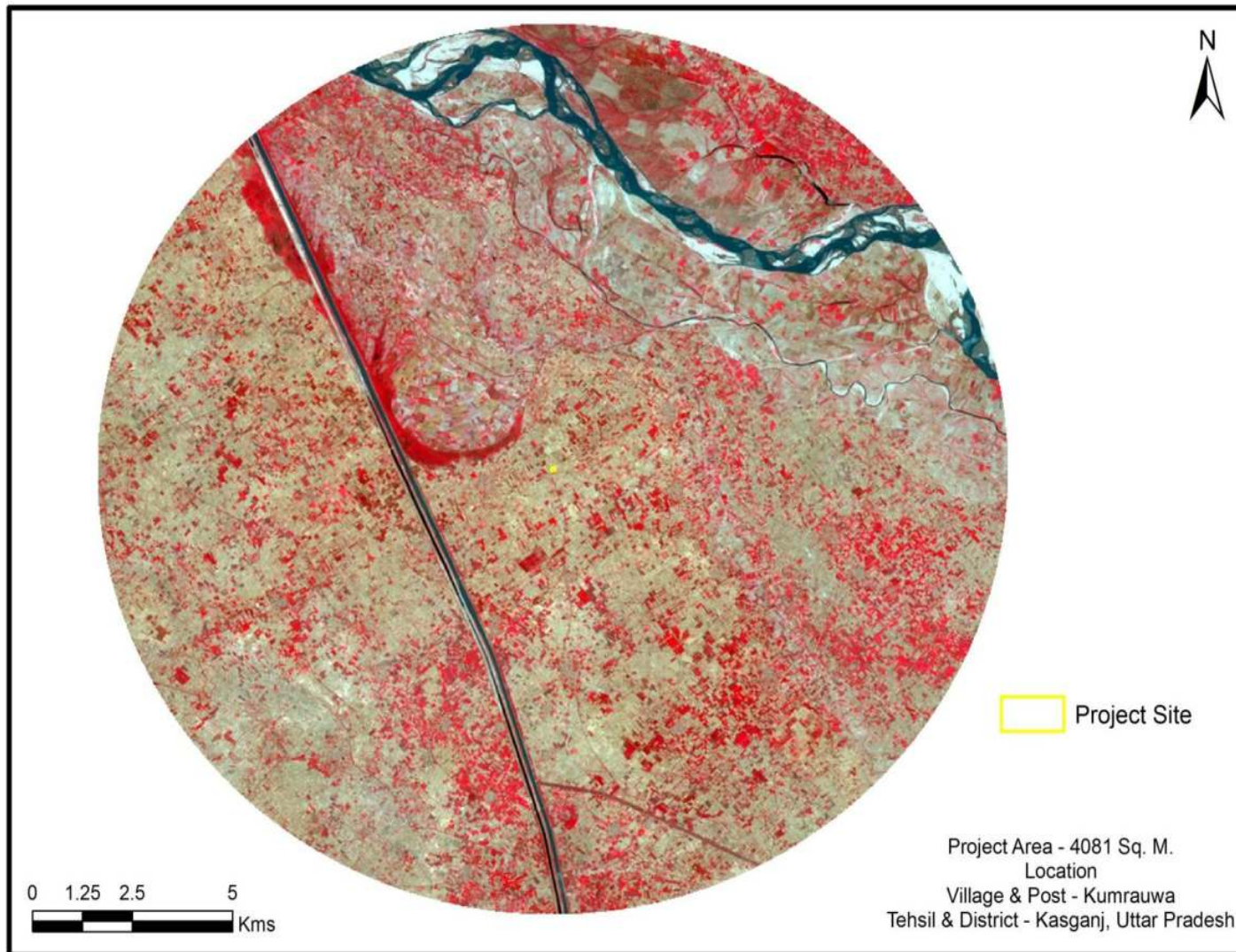
The satellite based remote sensing is a sustainable global information system because it has the potential to meet the needs and demands of the present and future. The synoptic Average, which provides capability for integration of real time information on regional and global scales, is a unique characteristic of this information system. Its versatility lies in its inherent capability to conceptualize situation to give clear perceptions for defining short term and long term objectives.

An activity could bring about changes in the Land use and Land cover in the vicinity. A data based on Land use and land cover indicates ecosystems existing in and around the centre of an economic activity, to safeguard to allow comparison at a future date to draw conclusions on the nature. The study reported here is with the honest intention of building such a database on land use and land cover in an area within about 10 km radius of the proposed project. The details of the land use present in the 10 km study area are given below in Table 3.25; Land use Land cover Map and satellite imagery shown in figure is shown in Figure 3.9 and 3.10.

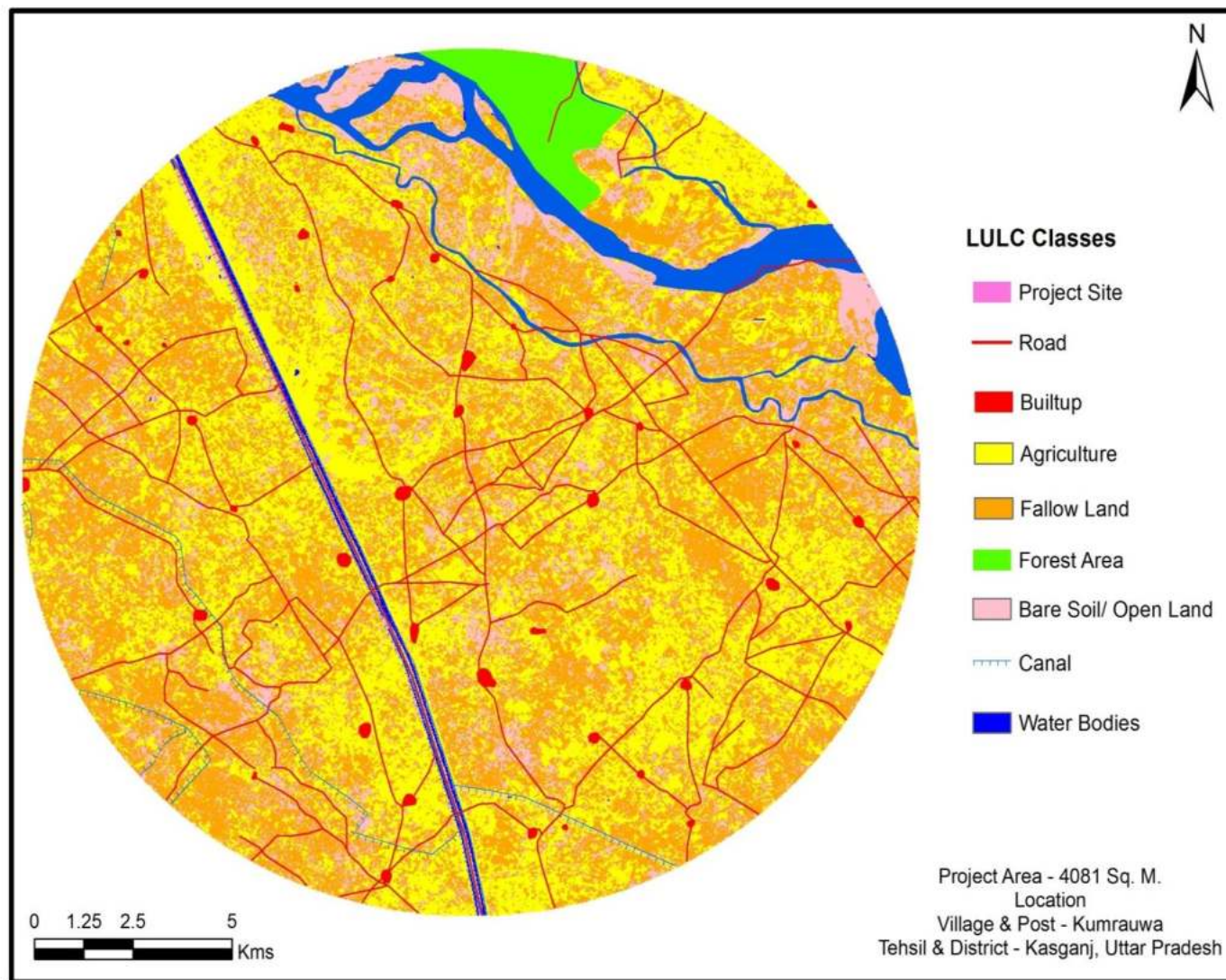
TABLE 3.27 DETAILS OF THE LAND USE PRESENT IN THE 10 KM STUDY AREA

Classes	Area (in Ha.)	Area (in %)
Project Area	0.41	0.01
Built-up Area	1119.99	3.56
Built-up Road	242.25	0.77
Agriculture	15283.46	48.58
Forest Land	1462.91	4.65
Fallow Land	6436.8	20.46
Barren/Hilly Area	6002.64	19.08
Water Bodies	909.21	2.89
Total	31457.67	100.00

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FIGURE- 3.10 SATELLITE IMAGERY

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FIGURE- 3.11 LANDUSE & LANDCOVER

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3.9 SOCIOECONOMIC SURVEY

Introduction

The study of socio-economic component of environment incorporates various facets, viz. demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region.

The project is for Proposed Common Bio-medical Waste Treatment Facility at Village- Kumraua, Block- Saron, Tehsil & District- Kasganj, U.P. On the basis of available census data, 2011 different aspects of socio-economic condition of total 66 villages in the study area have been analysed and surveyed.

Methodology used for the Field survey

In order to access and evaluate likely impacts arising out of any development projects on socio economic environment, it is necessary to gauge the apprehensions of the people in the study areas.

Methodology Adopted For the Study

Collection of data

The information analyzed for the project has been collected from various secondary sources, which has been supported by the extensive site visits and field observations.

- Secondary:_ Review of secondary data, such as District Primary Census of Kasganj and Aligarh District, Uttar Pradesh 2011 within the study area around the existing project.
- Primary: A social survey for examination of the respective site and specific region reference to its general character. A format developed to make it suitable to fulfill the objectives of the study. Primary data collected by Focus Group discussions in sample villages. Extensive site visits and observations of the socio economic environment.

In order to access and evaluate likely impacts arising out of any development projects on socio economic environment, it is necessary to gauge the apprehensions of the people in the study areas.

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Sampling method

The studies are conducted, and inferences are drawn on the basis of observation and field survey on the basis of non-probability random sampling and convenience sampling with access to the nearest villages of the project to the extent possible

Review of Demographic and Socio-Economic Profile – 2011

The sociological aspects of this study include human settlements, demography, social strata such as Scheduled Castes and Scheduled Tribes and literacy levels besides infrastructure facilities available in the study area. The economic aspects include occupational structure of workers. The information on socio-economic aspects of the study area has been collected from secondary sources, which mainly include District Primary Census 2011 of Kasganj and Aligarh District, Uttar Pradesh.

1. Data Collection and Quality Assurance

The available data have been complied to generate the existing socio-economic scenario of the study area. Information on socio-economic profile was collected from the Primary Census Abstract 2011, including the population details of the region and Village Directory 2011, having the details of basic amenities available in the region. In the 10 km radius study area constitute 66 villages from Kasganj and Aligarh District, Uttar Pradesh 2011

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Census 2011 data of SOCIO – ECONOMIC REPORT ON BMW PROJECT AT VILLAGE - KUMRAUA, TEHSIL & DISTRICT - KASGANJ, UTTAR PRADESH.

Table 00 - 10 KM

Sl. N.	Village name	No of Households	Population			Population 0-6			SC Population			ST Population			Literates				Workers			
			Total Population	Male	Female	Total Population 06	Male 06	Female06	SC Population	SC Male	SC Female	ST Population	ST Male	ST Female	P_LIT	M_LIT	F_LIT	P_ILL	Total worker	Main Worker	Marginal worker	Non Worker
	District - Kanshiram Nagar (Kasganj)																					
1	Mandawali	182	1091	576	515	265	128	137	364	200	164	0	0	0	121	91	30	970	270	267	3	821
2	Ismail Pur	320	1795	979	816	339	172	167	281	150	131	0	0	0	779	541	238	1016	597	548	49	1198
3	Abhaypura Rampur Pukhta	191	1091	602	489	190	107	83	119	64	55	0	0	0	311	220	91	780	314	311	3	777
4	Bahoranpur Dhelasarai	87	634	360	274	122	75	47	0	0	0	0	0	0	270	180	90	364	228	209	19	406
5	Allipurbarwara Pukhta	252	1546	827	719	234	111	123	170	92	78	0	0	0	740	471	269	806	602	408	194	944
6	Parmora Kham	39	198	109	89	36	18	18	135	76	59	0	0	0	102	70	32	96	57	44	13	141
7	Ghatesar	16	101	53	48	19	8	11	23	9	14	0	0	0	6	6	0	95	30	24	6	71
8	Gulabgarhi	44	266	153	113	57	36	21	0	0	0	0	0	0	65	43	22	201	65	56	9	201
9	Chandan Pur Ghatiyari	68	453	244	209	90	47	43	0	0	0	0	0	0	89	64	25	364	93	70	23	360
10	Parmora Pukhta	49	296	184	112	20	13	7	0	0	0	0	0	0	68	54	14	228	109	109	0	187
11	Ghuran Pur Pukhta	63	320	179	141	69	35	34	0	0	0	0	0	0	39	33	6	281	85	77	8	235
12	Dharm Pur	54	325	186	139	69	40	29	0	0	0	0	0	0	109	85	24	216	76	68	8	249
13	Baraoda	211	1286	713	573	253	141	112	28	15	13	0	0	0	517	366	151	769	404	400	4	882
14	Bharpura	215	1515	791	724	306	146	160	98	47	51	0	0	0	635	416	219	880	418	374	44	1097
15	Salem Pur Bibi	892	5322	2781	2541	1040	533	507	1017	509	508	0	0	0	2010	1303	707	3312	1776	1396	380	3546
16	Ukarri	336	1917	984	933	379	184	195	491	239	252	0	0	0	703	455	248	1214	560	555	5	1357
17	Bhaupur	230	1451	773	678	310	156	154	350	179	171	0	0	0	586	399	187	865	445	407	38	1006
18	Pachalana	308	1835	1028	807	363	204	159	167	99	68	0	0	0	521	370	151	1314	605	500	105	1230
19	Fazilpur	215	1161	662	499	246	142	104	249	141	108	0	0	0	460	350	110	701	336	243	93	825
20	Sirawali	437	2938	1622	1316	470	267	203	664	365	299	0	0	0	1254	824	430	1684	1117	643	474	1821
21	Kumraua	819	4881	2662	2219	857	455	402	378	201	177	0	0	0	1875	1247	628	3006	1872	1350	522	3009
22	Chandaus	381	2224	1208	1016	368	198	170	766	400	366	0	0	0	903	604	299	1321	1251	832	419	973
23	Kudhar	619	3730	2032	1698	593	291	302	867	469	398	0	0	0	1678	1223	455	2052	1186	947	239	2544
24	Daukeli	281	1691	900	791	265	142	123	290	164	126	0	0	0	721	509	212	970	504	418	86	1187
25	Patti Bhurha	37	203	106	97	35	19	16	108	55	53	0	0	0	65	45	20	138	73	71	2	130
26	Mahewa Khurd	125	619	346	273	102	53	49	33	19	14	0	0	0	259	182	77	360	316	196	120	303

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27	Harsaina	482	3197	1752	1445	522	258	264	843	471	372	0	0	0	1652	1131	521	1545	1193	990	203	2004
28	Kharhia	502	2808	1514	1294	501	252	249	1469	787	682	0	0	0	1249	842	407	1559	1251	1121	130	1557
29	Nameni	901	5449	2962	2487	871	472	399	993	538	455	0	0	0	2821	1834	987	2628	2391	1768	623	3058
30	Nagala Ulfat	253	1481	804	677	282	149	133	135	70	65	0	0	0	683	452	231	798	648	492	156	833
31	Aiman Pur	58	342	191	151	58	35	23	53	32	21	0	0	0	188	117	71	154	108	69	39	234
32	Ghatiya	62	401	202	199	65	32	33	0	0	0	0	0	0	208	132	76	193	214	208	6	187
33	Goyati	312	1687	899	788	285	141	144	183	90	93	0	0	0	826	540	286	861	770	659	111	917
34	Biraunchi	302	1725	927	798	326	173	153	450	248	202	0	0	0	767	513	254	958	601	437	164	1124
35	Pachura Goojar	46	236	127	109	47	28	19	10	5	5	0	0	0	114	69	45	122	78	78	0	158
36	Harnathpur Urf Nagalamoti	146	808	437	371	142	75	67	190	100	90	0	0	0	453	278	175	355	336	231	105	472
37	Bhidauni	310	1955	1055	900	351	182	169	221	113	108	0	0	0	1066	703	363	889	837	686	151	1118
38	Kislauli	464	2720	1502	1218	394	226	168	743	407	336	0	0	0	1482	953	529	1238	712	418	294	2008
39	Sohbat Bhoodh	160	911	473	438	174	88	86	188	96	92	0	0	0	471	299	172	440	254	227	27	657
	District – Aligarh																					
40	Gopalpur	102	514	275	239	110	54	56	323	176	147	0	0	0	198	141	57	316	159	127	32	355
41	Sankra	1081	6260	3417	2843	1129	584	545	384	192	192	0	0	0	2066	1416	650	4194	1816	1363	453	4444
42	Nagla Aliya	330	1862	976	886	448	226	222	119	66	53	0	0	0	481	302	179	1381	476	293	183	1386
43	Gopalpur	146	888	467	421	187	100	87	684	353	331	0	0	0	141	90	51	747	189	161	28	699
44	Haranpur Gair Ahatmali	255	1729	923	806	377	204	173	362	204	158	0	0	0	421	285	136	1308	454	242	212	1275
45	Kanchanpur	391	2436	1277	1159	487	266	221	484	256	228	0	0	0	812	546	266	1624	659	586	73	1777
46	Dari Alawlpur	289	1767	962	805	288	160	128	158	84	74	0	0	0	870	579	291	897	481	391	90	1286
47	Mohkampur Ta Dadon	147	953	509	444	157	79	78	47	23	24	0	0	0	396	259	137	557	249	248	1	704
48	Pithanpur	100	656	370	286	124	66	58	6	5	1	0	0	0	265	202	63	391	191	189	2	465
49	Abhaypur Bahlolpur	287	1874	1016	858	358	202	156	38	17	21	0	0	0	609	415	194	1265	614	535	79	1260
50	Ajvaman Dher	361	2242	1193	1049	426	214	212	132	67	65	0	0	0	765	552	213	1477	1125	1054	71	1117
51	Nah	573	3385	1873	1512	532	303	229	945	559	386	0	0	0	1477	1013	464	1908	1114	825	289	2271
52	Alampur Fatehpur	608	3521	1862	1659	579	290	289	893	466	427	0	0	0	1579	1121	458	1942	1049	847	202	2472
53	Bisora	345	2269	1264	1005	319	161	158	74	44	30	0	0	0	1144	776	368	1125	874	821	53	1395
54	Bajidpur	285	1840	990	850	301	159	142	613	305	308	0	0	0	964	618	346	876	655	607	48	1185
55	Bhay	227	1492	806	686	211	106	105	213	102	111	0	0	0	629	436	193	863	505	218	287	987
56	Nabipur	260	1510	825	685	368	196	172	434	238	196	0	0	0	499	329	170	1011	724	312	412	786
57	Sikanderpur	96	672	364	308	117	60	57	232	127	105	0	0	0	352	218	134	320	217	214	3	455
58	Kakabegpur	374	2288	1199	1089	456	214	242	47	22	25	0	0	0	645	448	197	1643	1004	660	344	1284
59	Bonai	690	4673	2507	2166	824	438	386	413	217	196	0	0	0	1849	1290	559	2824	1681	1193	488	2992
60	Samena Tatarpur	540	3693	2016	1677	632	346	286	224	122	102	0	0	0	1862	1249	613	1831	1227	1047	180	2466

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61	Nagla Meva	113	669	361	308	119	69	50	117	62	55	0	0	0	286	178	108	383	192	192	0	477
62	Kasimpur Math Kaser	312	1926	1052	874	306	171	135	295	154	141	0	0	0	886	607	279	1040	986	520	466	940
63	Jiravli	1145	6901	3767	3134	1148	606	542	1054	536	518	0	0	0	3179	2158	1021	3722	2174	1853	321	4727
64	Paindra Nawabpur	224	1375	712	663	262	137	125	361	184	177	0	0	0	775	469	306	600	407	219	188	968
65	Kaser	640	3667	1962	1705	603	314	289	976	505	471	0	0	0	1938	1274	664	1729	1077	870	207	2590
66	Bonai	224	1355	704	651	235	139	96	206	103	103	0	0	0	625	395	230	730	412	397	15	943
	Total	20614	125026	67554	57472	22218	11696	10522	21910	11639	10271	0	0	0	52579	35380	17199	72447	43493	33891	9602	81533

As per 2011 census the study area consisted of 125026 persons. The distribution of population in the study area is given below.

TABLE 3.28: DISTRIBUTION OF POPULATION

Particulars	0-10 Km
No. of Households	20614
Male Population	67554
Female Population	57472
Total Population	125026
Male Population(0-6 Years)	11696
Female Population (0-6 Years)	10522
Total Population (0-6 Years)	22218
Average Household Size	6
% Of 0-6 Years to the total Population	17.77%
% Of males to the total Population	54.03%
% of females to the total Population	45.97%
Sex Ratio (no of females per 1000 males)	851
Source: Primary census abstract 2011, Kasganj and Aligarh, Uttar Pradesh	

Human Settlement

The study area comprises 66 villages with population of about 125026 (Male-67554 & female – 57472) and number of households are 20614. (According to the Census 2011).

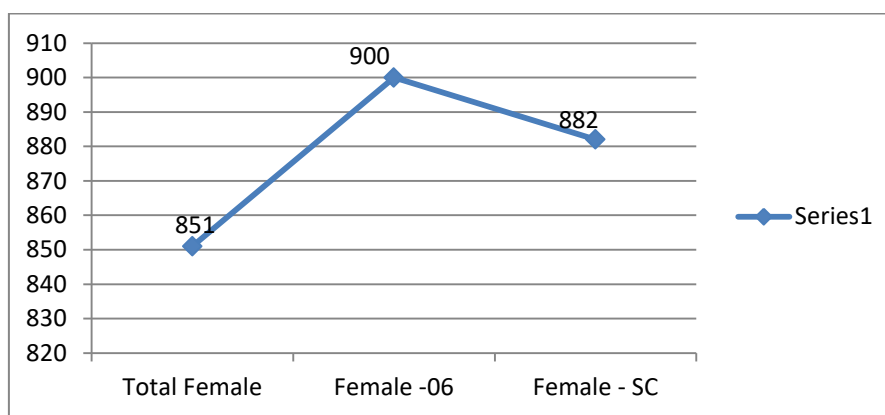
Population The total number of households is 20614 with an average household size of 6 people. Hence, it is interpreted there are joint family systems in the study area. There are 125026 people in the study area as per the census survey of India, 2011.

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Gender Ratio

The data reveals that male and female percentage in this area is 54.03% and 45.97% respectively. The study areas on an average 851 females are per 1000 males which are not good indicators inspect of gender equality. Accordingly census record the number of females per 1000 males indirectly reveals certain sociological aspects in relation with female births, infant mortality among female children. The complete demography of the area is given above in table no.1. Child 0-6 sex ratio is 900 females to 1000 male. In SC category 882 female to 1000 male and there is no ST category population in study area, details are presented in Figure 3.10.

FIGURE 3.12: SEX RATIO IN THE STUDY AREA



Caste Categories:-

As per the classification under our constitution castes are divided into 4 major groups i.e., General, SC, ST and OBC as per their social status.

TABLE 3.29: DISTRIBUTION OF POPULATION BY SOCIAL STRUCTURE

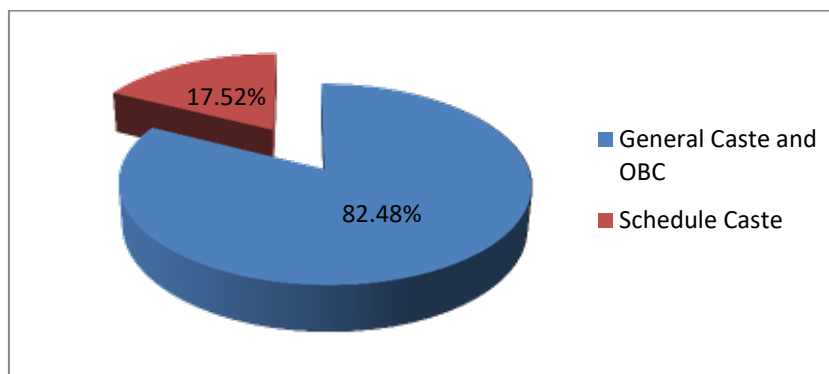
Particulars	0-10 km
Total Population	125026
SC Male Population	11639
SC Female Population	10271
Schedule Caste Total Population	21910
% to the total population	16.49%
ST Male Population	0
ST Female Population	0
Schedule Tribes Total Population	0
% to the total population	17.52%
Total SC and ST population	0
% to total population	17.52%
Source: Primary census abstract 2011, Kasganj and Aligarh, Uttar Pradesh	

Social stratification on the basis of caste is very much prevalent in our society from the date back to the history. The population from general/upper castes is richer than SCs in terms of land

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and livestock. Various religion castes consisting of Hindus and Muslim inhabit the study area. As per 2011 census, the percentage of Schedule caste population is very low i.e. 17.52% and there are not any Schedule tribe population. Only 17.52%, total population of SC in study areas. Details are presented in Figure 3.13.

FIGURE 3.13: CASTE CATEGORIES IN THE STUDY AREA



Literacy Levels

The study area experiences a considerably average literacy rate of 51.14% (2011). The distribution of literate and literacy rate of study area is in tabulated below

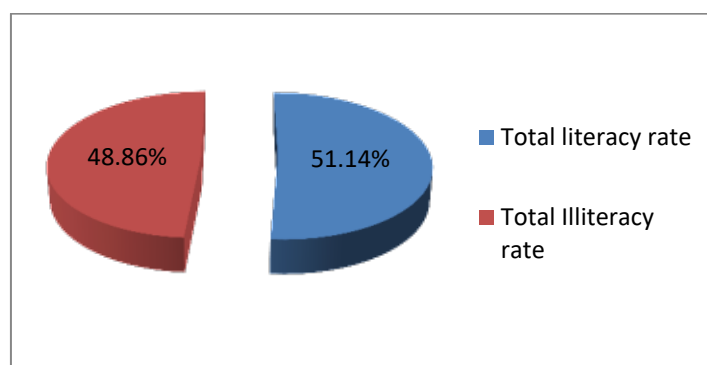
TABLE 3.30: DISTRIBUTION OF LITERATE AND LITERACY RATES

Particulars	0-10 km
Male population	67554
Female population	57472
Total population	125026(-22218)
Male population (0-6years)	11696
Female population (0-6 years)	10522
Total population (0-6 years)	22218
Male literates	35380
Female literates	17199
Total literates	52579
Male literacy rate (%)	63.34%
Female literacy rate (%)	36.63%
Total literacy rate (%)	51.14%
Total Illiterates	72447 (-22218)
Total Illiteracy rate (%)	48.86%
Source: Primary census abstract 2011, Kasganj and Aligarh, Uttar Pradesh	

The male literacy i.e. the percentage of literate males to the total males works out to be 63.34%. The female literacy rate, which is an important indicator for social change, is observed to be 36.63 % as per 2011 census records.

From the above given data, it is revealed that illiterate rate is very high in the study area. 48.86% Population is illiterate in the study area. Literacy rate is given in Table 3.26 and Figure 3.12.

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FIGURE 3.14: LITERACY RATE IN THE STUDY AREA

Employment Pattern

Economic resource base of any region mainly depends upon its economically active group i.e. the working population involved in productive work. Work may be defined as participation in any economically productive activity. Such participation may be physical or mental in nature. Work not only involves actual work but also effective supervision and direction of work. It also includes unpaid work on farm or in family enterprise.

There are different types of workers that may be classified as - those persons who had worked for at least six months or 183 days are treated to be Main Workers, on the other hand if person categorized as worker has participated in any economic or productive activity for less than six months or 183 days during the last one year is treated as Marginal Worker. Non-workers are those who have not worked any time at all in the year preceding the enumeration.

The workers coming under the main and marginal workers category are those involved in activities such as cultivation, agriculture, livestock, forestry, fishing, hunting, plantations, orchards and allied activities, mining and quarrying, manufacturing, processing, servicing and repairs in household industry, construction, trade and commerce, transport, storage and communication and other services.

TABLE 3.31: EMPLOYMENT PATTERN

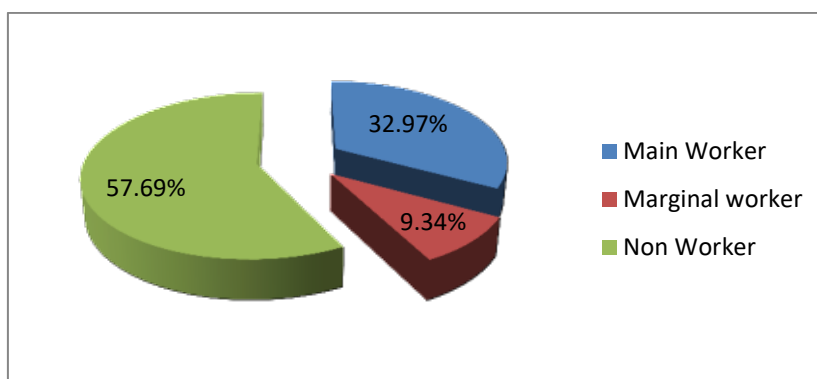
Particulars	0-10 km
Total population	125026 (-22218)
Total population (0-6 years)	22218
Total workers	43493
Work participation rate (%)	42.31%
Total main workers	33891
% of main workers to total population	32.97%
Marginal workers	9602

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% of marginal workers to total population	9.34%
Non-workers	81333 (-22218)
% of non- workers to total population	57.69%
Source: Primary census abstract 2011, Kasganj and Aligarh, Uttar Pradesh	

As per 2011 census records altogether the main workers works out to be 32.97% of the total population. The marginal workers and non-workers constitute to 9.34% and 57.69% of the total population respectively. The distribution of workers by occupation indicates that the non-workers are the predominant population.

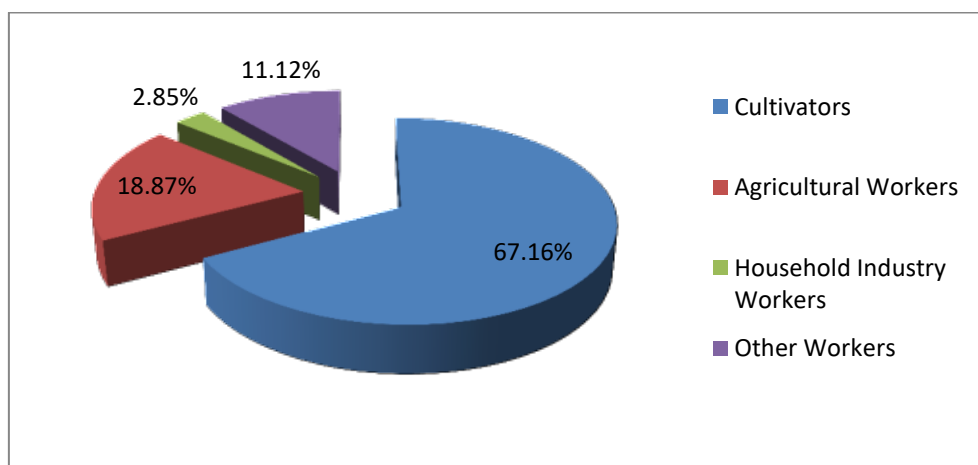
FIGURE 3.15: EMPLOYMENT PATTERN IN THE STUDY AREA



MAIN WORKERS EMPLOYMENT PATTERN

Main workers are classified in four categories as cultivators, agricultural workers, household industry workers and other workers. As per 2011 Census, out of total 33891 main workers in the study area, there were total 22762 cultivators (67.16%), 6396 agricultural workers (18.87%), 965 household industry workers (2.85%) and 3768 other workers (11.12%). Mostly in main workers population cultivators were highly found in study area.

FIGURE 3.16: MAIN WORKERS EMPLOYMENT PATTERN IN THE STUDY AREA



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Infrastructure Facilities

The infrastructure and amenities available in the area denotes the economic wellbeing of the region. The study area as a whole possesses poor to moderate level of infrastructure facilities. However, in comparison with the facilities available in other parts of the districts, this area has good level of amenities like education, health, drinking water, electrification, transport and communication network.

A review of infrastructure facilities available in the area has been done based on the information given in District Census of Kasganj and Aligarh, Uttar Pradesh.

Educational Facilities

Educational status is positively correlated to the economic development of a person and the society as a whole. This is very much reflected in the study area. In order to make the education profile more informative the Local people have been grouped into eight educational categories i.e., illiterate, literate, primary, HS, Intermediate, Graduate/PG, others (includes technical education such as Hotel Management, Polytechnique, ITI etc.) and those below the age of 5 years.

The general trend in the Buffer zone shows that the younger population is almost 95-96 % literate, whereas the majority of illiterates are in the 50+ age group. Education in the study area is average. The facilities are available in every village and is promoted and accepted.

- **Health Status:** - Health facilities, which include different types of hospitals and dispensaries, are available in the area. The level of health facilities is good in study area. All the medical facilities are available at Kasganj and Aligarh.
- **Drinking water facilities:** - Water is finite but all life is infinite from mankind's viewpoint. Hence water has to support and sustain all life – human, animal and plant. Some of villages are connected with tap water facility and rest of villages has Hand pumps for source of drinking water.
- **Electricity:** - There is no source of electricity generation. All the power consumed is received from Uttar Pradesh Power Corporation Ltd. (UPPCL). Almost all the villages are connected with electricity in the study area.
- **Rail head:** -Nearest railway station is Kasganj Railway Station, 16.10 Km in South from project site.
- **Airport:** - Agra (Pandit Deen Dayal Upadhyay) Airport, 110 Km in SW from project site.

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- **Post:** - Post Office is within in nearby villages and few villages have Post office or Sub Post Office & most of all Villages are connected with mobile phone facilities in the study area.
- **Bus:** - Kumroua Village is connected with Black Topped (Pucca) Road facility, Pvt. Bus & Jeeps are available for transportation. There is good network of road and most of the villages are connected with POVED & MUD Road. The Bus facilities are available in all villages in the Buffer zone and Uttar Pradesh State Transport (UPSRTC) Buses facility is good in the areas.

The Primary data of socio-economic status are collected in the study area. During study period, FAE & his team has discussed to the Villagers, School Teachers, Aaganbadi Employees, Van Sahayak, Gram Sevak, Patwari, Sarpunch and Filled the socio-economic survey formats by randomly in core & buffer zone. The details are given below:

Field Survey and Observations

Field survey and observations is made at each sampling village and the socio-economic status of that region is studied. Visits are made at hospitals, primary health centres and Schools to know the health and educational status of the region. Various Governmental organizations such as Statistical Department visited to collect the requisite details of that region.



Project Site



Village- Kumrawa



Village- Pachlana



Village- Nagla Jaisiya

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Village – Kendi



FGD at Kendi Village

TABLE 3.32: LIST OF SAMPLING VILLAGES

Sr. No	Villages
1.	Project Site
2.	Kumarua
3.	Pachlana
4.	Nagla Jaisiya
5.	Sirawali
6.	Takharu
7.	Gohati
8.	Kaindi

Salient Observation of the Survey/ Study Area

- ❖ **Economy:** The main occupations of the population are agriculture and animal husbandry. Some small industrial units have been established at Kasganj and Alighrah. Besides, army / para-military forces, teaching and making bricks are major source of employment for young people. Due to the lack of required infrastructure and the geography of the area, there are no major industries in this part of the district.
- ❖ **House pattern:** It is notable that Almost 90% of houses are Pucca Houses and rest are Semi- pucca houses in study area. People are using Hindi language.
- ❖ **Employment:** Main occupation in the study area is labour work, agriculture and its allied activities Cattle rearing, dairy farming etc. Agricultural activity was mainly depending on canal water supply and their own tube wells. Other income generation sources of the areas are small business, private jobs, engagement in making bricks etc. The labours were getting daily wages in the range of 350-450 Rs. depending on type of work they are doing.
- ❖ **Fuel:** Most of the villagers use LPG for cooking purpose.

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- ❖ **Agriculture:** Agriculture occupies the foremost place in the economy of Kasganj district as more than 50 percent of the total workers of the district were engaged in cultivation or allied occupations. The government is making all efforts to develop the agricultural sector by distributing improved seeds, fertilizers and pesticides, increasing irrigation facilities and promoting modern techniques of multiple cropping practices and improved agricultural implements. It also keenly promotes animal husbandry, fisheries and forestry which play a subsidiary but an important role in the agricultural economy. The wells and tube wells are the principal source of irrigation in the district.
- ❖ **Main Crops:** Bajra and paddy are major crops of Kasganj. crop grown by the farmer of study area are rice, wheat, maize, and pulses.
- ❖ **Migration:** During survey it was found that local population were migrating for employment purpose. Male from families are migrated to Delhi, Gurugram and Noida in search of work leaving females behind at home.
- ❖ **Sanitation:** Sanitation facility coverage as found in primary survey may be comparatively better in the urban areas, but in rural areas. Sanitation programme is going on in study area under “Swachh Bharat Mission” Namely – IJJAT GHAR and people are well aware about sanitation and its sustainability. Most of households are creating toilets in study area and rest of household’s work is going on.

FIGURE 3.17: COMMUNITY TOILETS IN THE VILLAGES CONSTRUCTED BY STATE GOVT. VILLAGE-GOHATI



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- ❖ **Drinking Water Facilities:** Water is a precious resource. Drinking water has always been on top of the priority list of social consumption items (drinking water, sanitation and medical, education facilities etc.). Water is not only essential but also scarce. With the development and growing population the share of drinking water sources is changing significantly. Tap is the major and dominant source of drinking water, in rural UP Tube well/borehole and Hand pumps are the next major source.
- ❖ **Education Facilities:** Most of the villages had education facilities in the form of Anganwadi and Primary Schools. Higher education facilities were available in the range of 5-10 km. Colleges and other diploma courses were available at Barwara and Kasganj.

FIGURE 3.18: PHOTOGRAPHS OF GOVT. SCHOOL- SIRAWALI & TAKHARU



Govt. School – Sirawali



Govt. School – Takharu

The highest education standard of family members is 8th -10th class which is in 75% families. The Education standard is good due to local people are aware about the education as well as professional qualification due to industrial area and city environment. They are sending the children at their village school and most of all villages have primary school. For further education they sent the children to another school which is situated at nearby village Batwara and Kasganj city. There are no school dropout children and all most all the children are enrolled in the schools. According to school teachers villagers are well aware about education and paying attention in sending children to school daily basis so absenteeism percentage is very low.

- ❖ **Transportation Facility:** For transportation purpose Auto, Public and Private Bus services were available in study areas. Transportation facilities were frequently available in the study area and connecting major cities. Private vehicles like Bicycles & Motor Cycles were mostly used by villagers for transportation purpose.

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- ❖ **Road Connectivity:** Most of the roads were pucca and connecting to villages. Dambar and cement roads were commonly seen inside the villages.
- ❖ **Communication Facilities:** For communication purpose mainly mobile phones, newspaper & post offices were seen in the villages.
- ❖ **Medical Facilities:** The availability of medical facilities in the study area is good, there are average numbers of dispensaries, maternity and family welfare centres are available
- ❖ **Electricity:** There is no source of electricity generation. All the power consumed is received from Uttar Pradesh Power Corporation Ltd. (UPPCL). Almost all the villages are connected with electricity in the study area
- ❖ **Market Facility:** Study area is predominantly rural. In villages, small shops were available for daily needs. Wholesale markets were available at Kasganj
- ❖ **Animal's husbandry:** The animal husbandry sector plays an important and vital role in providing a source of food, rich in animal protein to the general public and supplementary income to the economically weaker section of the society like S.C., S.T. and small farmers, marginal farmers and agricultural laborers. In addition, it offers a good employment generation potential, if adopted on large commercial basis. Despite mechanization in various agricultural operations, draught animal plays a very significant role. Normally local villagers are based upon cattle and buffaloes. Villagers are generating daily income from these animals. They are sailing Milk to dairy point and get appropriate rates during the year and also supply the milk in their village and nearby dairy point, Hotels/ road side Dhaba.
- ❖ **Savings:** - At study area earnings of families are depend on agriculture crops, daily labour work and some of their small type of business. 55% families has source of income is agriculture. Their yearly income and expenditure is equal so they enable to do saving.
- ❖ **Family assets:-** For assessing the family condition as per movable (material) assets information has been taken from the study area. Its show that People have own Television sets, tape, radio, mobile, LPG connections and refrigerator respectively in their houses. Few populations have two wheeler, 4 wheeler, and goods vehicle & own some other assets such as washing machine, telephone, VCD, sewing machine, etc.

Awareness and Opinion about the project

- The respondents from almost of all the villages are not aware about this BMW project. The respondents have mixed view about the project. Most of the respondents have fear about the increased solid waste, air, water & soil contamination and emission odour.

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- Some respondents from the nearby villages have in the region show favorable opinion about Project and associated activity as it may lead to increase in infrastructural facilities and job opportunities.

Expectation from the project

- Local employment
- Plantation at nearby areas and ensure their survival rate.
- Free Medical facilities for villagers and organize medical camps in nearby villages for seasonable diseases.

Impact on Human Settlement

The impact on socio economic of surrounding area will be positive, as Project will directly employ the local workers. Preference to local people residing nearby will be given direct employment for this project. There is no displacement of any habitation or personnel and hence the rehabilitation and resettlement action plan is not required.

Impact on Social Status: The socio-economic status of the nearby villages in the study area. Due to proposed project the facilities for public transport, water supply, telecommunications, education and public wealth are likely to improve. The study area is predominantly inhabited by rural population. The proposed project is likely to provide more opportunities in employment to this area. The preference in employment will be provided to the local residents in this area. Thus, population of the study area will be benefited due to the project in terms of direct and indirect employment opportunities. Overall socio - economic effect of construction phase will be positive due to direct and indirect employment opportunity for the local livings. Local people from nearby villages of the surroundings from the site will be employed for construction work to the maximum extent possible.

Employment Opportunity: The project will create opportunities for employment for local people. Skilled and unskilled manpower will be needed. Secondary jobs are also bound to be generated to provide day-today needs and services to the work force. This will also temporarily increase the demand for essential daily utilities in the local market. Due to this proposed project, relevant to this project other job opportunities may generate which will improve the socio-economic status of the area. Neighboring villagers of the project will get more benefits by giving preference to them in relation to direct employment associated with the various project activities. Construction and operation phase of the proposed project will involve a certain number of laborers, contractors and

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construction workers. There is a possibility that local people will be engaged for this purpose to the extent possible and hence improve the existing employment scenario of the region.

Impact on Public Health: Efficient Bio Medical waste collection & disposal of waste will improve the living & health condition of inhabitants in the area. Bio Medical waste management project will ensure timely collection of waste, efficient treatment & disposal in scientific & environment friendly manner. This will reduce the chances of spreading of diseases. This project will improve the health condition of the area and society.

Impact on Health Care Facilities: While BSW activities, sufficient care will be taken in providing health facilities to their employees besides organizing various medical camps for the surrounding villages. The improved health care facilities improve the quality of life in the area.

Impact on Economic Aspects: Project will generate both direct & indirect employment. Local people will be preferred for giving employment. This will improve economic status of the area. Emigration of local people to other parts of state/country due to unavailability of employment will be reduced. The land value of near to the project land will decrease due to this project because of emission of mal odour.

Impact on Archeological and Historical and Places of Religious worship & Tourist Places: The BMW project is unlikely to cause any impact on these places or structures or devotees.

Socio-Economic Development

Based on the requirement of the people in the area, various development activities will be taken by project proponent regularly. The basic requirement of the community are strengthened by extending health care, educational facilities, providing drinking water to the villages affected, building/strengthening of existing roads in the area etc.; In order to obtain felt needs of the surrounding villagers for effective implantation of desired needs. The proposed project may create opportunities for indirect employment in the field of vehicle hiring, labors, trading of construction material, service sector etc. This will help in improving the socio-economic status of the region.

Steps to be taken to Improve Socio-Economic Conditions

The socio-economic conditions in the study area indicate the quality of life of the people. The important indicators which decide the quality of life and required to be improved for better living conditions are literacy levels, occupational structure, infrastructural facilities, transportation, communication linkages, land development and cropping pattern. The project proponents are envisaging undertaking the following socio-economic measures.

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- **Health Care:** The adequate funds will be allocated for mobile dispensary, family planning, medical camps and aid to the Govt. hospitals
- **Educational Facilities:** These include adult education facilities, financial assistance for higher studies, sponsorship to vocational / professional training institution, computer education camps, vocational training for students and aid to existing/proposed Govt. schools and colleges.
- **Civic Amenities:** These include support to community toilets, drinking water facilities like public stand posts, elevated service reservoirs, playgrounds for children and recreation facilities for all age groups. In addition to this participation and support to government efforts.
- **Employment:** Development of project will provide employment opportunity to local skilled, unskilled & semiskilled people during both construction & operation phase. Indirect employment may also generate during construction phase of project. Tea stalls, and food shop may come up around project site for workers

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CHAPTER-IV

ANTICIPATED

IMPACT &

MITIGATION

MEASURE

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CHAPTER-IV

ANTICIPATED IMPACTS & MITIGATION MEASURES

4.1 IDENTIFICATION OF IMPACTS

In this chapter, an endeavor has been made to identify various environmental impacts associated with the operation of facility and other activities wherein, there may be a chance of pollution. Based on the possible worst case emissions and waste generation from the proposed project and also taking into consideration the baseline environmental status at the proposed project site, the environmental factors that are likely to be affected (Impacts) are identified, quantified and assessed. Both instrumental (positive) and detrimental (negative) impacts are accounted for this purpose. The prediction of impacts helps in the preparation of a sound environmental management plan which has to be executed during the on-going activities for the proposed project to minimize the adverse impacts on the environmental quality.

4.2 METHODOLOGY

The potential impacts on the environment from the proposed project are identified based on the nature of the various activities associated not only with the project implementation and operation, but also on the current status of the environmental quality at the project site.

4.3 POTENTIAL IMPACTS

The potential significant environmental impacts associated with the project are grouped as below:

Air Environment

- Impacts on ambient air quality
- Impacts on ambient odor
- Impacts on ambient noise

Water Environment

- Impacts on surface & ground water quality
- Impacts on aquatic life

Land Environment

- Impacts on land use
- Impacts on agriculture/ soil fertility

Socio Economics

- Impacts on infrastructure
- Impacts on employment

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Indirect Impacts

- Impacts on public health and safety
- Impacts on aesthetics

4.3 IMPACTS DURING CONSTRUCTION

Construction phase works include site clearance, site formation, excavation, material handling, building works, infrastructure provision and any other infrastructure activities. The impacts due to construction activities are short term and area limited to the construction phase. The impacts will be mainly on air quality, water quality and soil quality.

4.3.1 Impact on Air Quality

The principal potential source of air quality impact arising from the construction of the proposed project is fugitive dust generation. The dust, measurable as Particulate Matter would be generated as a result of construction activities. The potential dust sources associated with construction activities are loading and unloading of the materials, top soil removal, travel over unpaved roads and wind erosion etc. The construction works associated with the proposed development are broadly given below.

1. Site development and foundation works
2. Dust generation due to vehicles bringing raw materials
3. Unloading of raw materials, removal of unwanted waste material from site
4. Civil constructions and provision of infrastructure required for various activities proposed

Exhaust emissions from vehicles and equipment deployed during the construction phase is also likely to result in marginal increase in the levels of SO₂, NO_x, PM, CO and un-burnt hydrocarbons. The impact of such activities would be temporary and restricted to the construction phase. The impact is generally confined to the project area and is expected to be negligible outside the plant boundaries.

Mitigation Measures-

For the proposed project site levelling and grading will be carried out, where ever possible to maintain the natural elevations that will not be disturbed, only levelling 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 shall be reused within the project boundary. The movement of cut and fill material will be limited.

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Dust will be generated from the movement of construction vehicles on unpaved roads. Unloading and removal of soil material shall also act as a potential source for dust nuisance. The control measures proposed to be taken up are given below.

- The important dust suppression measures proposed will be regular water sprinkling on main haul roads in the project area, this activity will be carried out at least twice a day, if need arises frequency will be increased on windy days, in this way around 50% reduction on the dust contribution from the exposed surface will be achieved.
- The duration of stockpiling will be as short as possible as most of the material will be used as backfill material for the open cut trenches for 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, so that the area will be moist for most part of the day.
- To reduce the dust movement from civil construction site to the neighbourhood the external part of the building (administration, canteen, etc) will be covered by plastic sheets.

Given the implementation of proper control measures for dust suppression, no adverse impacts are expected.

4.3.2 Impact on Water Quality

The proposed project will involve various construction activities. The following section summarizes the activities likely to be undertaken during the proposed development and describes the potential impacts on water quality from each activity. The site formation may produce large quantities of run-off with high suspended solids loading in the absence of appropriate mitigation measures. This potential problem may be aggravated during rainy season.

The used engine oil and lubricants, and their storage as waste materials as the potential to create impacts if spillage occurs. Waste oil may infiltrate into the surface soil layers, or runoff into local Water courses, increasing hydrocarbon levels. Proper precautionary measures should be taken to prevent any spillage of the above materials and their subsequent runoff into the water bodies.

During construction, impacts from the workers include waste and wastewater generated from eating areas, and sewage from temporary sanitary facilities. Sewage is characterized by high levels

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of BOD, ammonia and E.Coli. Significant water quality impact will happen only if the sewage is discharged directly into the receiving waters without any prior treatment.

Mitigation measure

During site development necessary precautions will be taken, so that the runoff water from the site gets collected to working pit and if any over flow is, will be diverted to nearby greenbelt/ plantation area. During construction activity all the equipment washed water will be diverted to working pit to arrest the suspended solids if any and the settled water will be reused for construction purposes, and for sprinkling on roads to control the dust emission, etc.

The domestic waste water generated from temporary toilets used by the work force will be diverted to septic tank followed by soak pit. If the waste water generation is more a mobile STP will be hired from local suppliers.

4.3.3 Impact of Noise Levels

The major activities, which produce periodic noise, during construction phase, are as follows:

- Foundation works
- Fabrication of structures
- Plant erection
- Operation of construction equipment
- Movement of vehicles etc.

Mitigation measures

All noise generating equipment will be used during day time for brief period of its requirement. Proper enclosures will be used for reduction in noise levels, where ever possible the noise generating equipment will be kept away from the human habitation.

Therefore, impact on noise environment due to proposed project would be insignificant. All vehicles entering into the project will be informed to maintain speed limits, and not blow horns unless it is required.

4.3.4 Impact Due to Solid Waste Generation

This category of waste generation in the proposed project is due to different types of raw materials being used during construction stage in general may comprise the following

- Cement concrete
- Bricks, tiles,
- Cement plaster

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- Steel (RCC, door/ window frames, roofing support, railings of staircase etc)
- Rubble, sand, Stone (Marble, granite, sand stone)
- Timber/wood
- Paints/varnishes

Besides above there are some major and minor components namely conduits, geo membrane, pipes, electrical fixtures, panels, etc. all the above items will be segregated and stored at the site and once the facility established the same will be used in respective treatment facilities within the site.

Mitigation measure

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

- All construction waste shall be stored within the site itself. A proper screen will be provided so that the waste does not get scattered.
- Attempts will be made to keep the waste segregated into different heaps as far as possible so that their further gradation and reuse is facilitated.
- Materials, which can be reused for purpose of construction, levelling, making roads/ pavement will also be kept in separate heaps from those which are to be sold.
- The local body or a private company may be arranged to provide appropriate number of skip containers/ trolleys on hire

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. It would, however, be desirable to have quality standards for the recycled materials. Construction waste can 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/ auction of materials which cannot be used at the site due to design constraint
- Plastics, broken glass, scrap metal etc will be stored and processed within the site premises.
- Rubble/ brick bats can be used for building activity, such as levelling, under coat of lanes where the traffic does not constitute heavy moving loads.

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- Larger unusable pieces can be sent for filling up low lying areas.
- Fine material such as sand, dust, etc can be used as cover material
- The unearthed soil can be used for levelling as well as for lawn development
- The broken pieces of the flooring material can be used for levelling in the building or can be disposed off
- The unused or remaining paints/varnishes/wood can either be reused or can be disposed off.

4.3.5 Impact on Land Environment

No significant impacts on land use are anticipated from construction activities. However, there may be minor impacts because of construction debris, paint, diesel etc.

Mitigation measures

Following steps are proposed to take care of impact of construction activity on project land area:

- On completion of civil works, all debris etc. will be completely removed from site to avoid any incompatibility with future use.
- Other materials like paint, diesel etc. will be properly stored and handled to prevent any spillage on land.
- All the wastes will be stored at a designated site within the premises to prevent scattered discharge on land.

4.3.6 Impact on Ecology & Biodiversity (Flora & Fauna)

- Spillage of construction material in the plant area and dust emission due to transportation and construction activities. Deposition of dust (PM₁₀ & PM_{2.5}) on leaves may reduce the rate of photosynthesis and metabolic activities by construction activities. It is major impact on the flora of the surrounding area. Plant leaves will be degraded and reduce its growth.
- Noise and Vibration generation due to movement of machineries, Use of equipment's installation of machinery, new fabrication work, movement of two and four vehicles and transportation of materials (In and Outside) to and other project activities.
- Due to all project activities wildlife and birds may move to nearby villages other area. Its site specific and minor impact on surrounding people and ecology and biodiversity of the area.
- Loss of existing soil characteristic due to proposed project activities.
- Change in land use pattern in the core zone due to construction phase which lead to minor disturbance of growth of flora species.

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- Less than 1 KLD domestic wastewater would be generated from workers. It will be minor impact on ecology and biodiversity of the area.

Mitigation Measures

- Proposed planation (greenbelt development) with suitable native species as per CPCB guidelines will help to mitigate likely cumulative impacts by absorbing pollutants like CO₂, SO₂, NO_x etc.
- Plantation in safety zone will also protect the soil from wind erosions.
- Water sprinkling shall be carried out regularly; so as to avoid fugitives dust formation and deposition of same on plantation.
- Proper fencing will be provided and maintained at the boundary to avoid any animals at proposed project site.
- Personnel protective equipment's (PPE's) will be provided to all workers who are engaged for construction activities at inside project area.
- Proper and timely maintenance of machines and transport vehicle will help to check and reduce sound nuisance.
- The wastewater generated shall be treated and reused within the premises for greenbelt development & floor, vehicle washing purposes. Thus, proposed plant is zero liquid discharge plant.
- Emission levels of NO_x and SO₂ all pollutants will be kept within CPCB permissible levels through various engineering control measures.
- All pollutants will be kept within CPCB permissible limits, considering impact, minor short-term impacts are expected on surrounding flora and fauna.
- The emission levels of emitted pollutants will remain in permissible limits due to use of PUC certified vehicles complying vehicular emissions norms, considering cumulative impact, minor short-term impacts are expected on associated biodiversity.
- Proper sanitary will be maintained at site during construction activities.

4.3.7 Impact on Socio-Economics

Overall socio - economic effect of construction phase will be positive due to direct and indirect employment opportunity for the local livings. Local people from nearby villages of the surroundings from the site will be employed for construction work to the maximum extent possible.

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4.4 IMPACTS DURING OPERATION PHASE

During the operation phase of the proposed project there would be impacts on the air environment, water environment, Land environment and socio-economic aspects.

4.4.1 Prediction of Impacts on the Air Environment

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

1. Line source emissions from vehicular movement
2. Point source emissions from Incinerator, DG set.

The emissions from the DG sets are minimal since they will be operated only during power failures.

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 9.9.0 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.

$$C(x, y, z) = \frac{Q}{2\pi u \sigma_y \sigma_z} e^{-\frac{y^2}{2\sigma_y^2}} \left(e^{-\frac{(z+H)^2}{2\sigma_z^2}} + e^{-\frac{(z-H)^2}{2\sigma_z^2}} \right)$$

Where C = Plume contaminant concentration (µg/m³)

Q = Pollutant emission rate (g/s)

u = Average wind speed (m/s)

σ_y = y direction plume standard deviation (m)

σ_z = z direction plume standard deviation (m)

y = y position (m)

z = z position (m)

H = Effective stack height (m)

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

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- Predictions have been carried out to estimate concentration values 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

Pollution Sources

The main air pollutant expected from line sources are dust generation from the movement incoming & outgoing vehicle.

To minimize the impact from line source, black carpeted road will be maintained properly to reduce the dust generation. All vehicles will be maintained properly to meet emission standard of respective vehicles. Green belt will be provided along the boundary and along the road.

The point source emissions considered for the proposed project are Incinerator and DG set. 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. The inputs used to run the model are stack details, emissions details are given in **Table 4.1**.

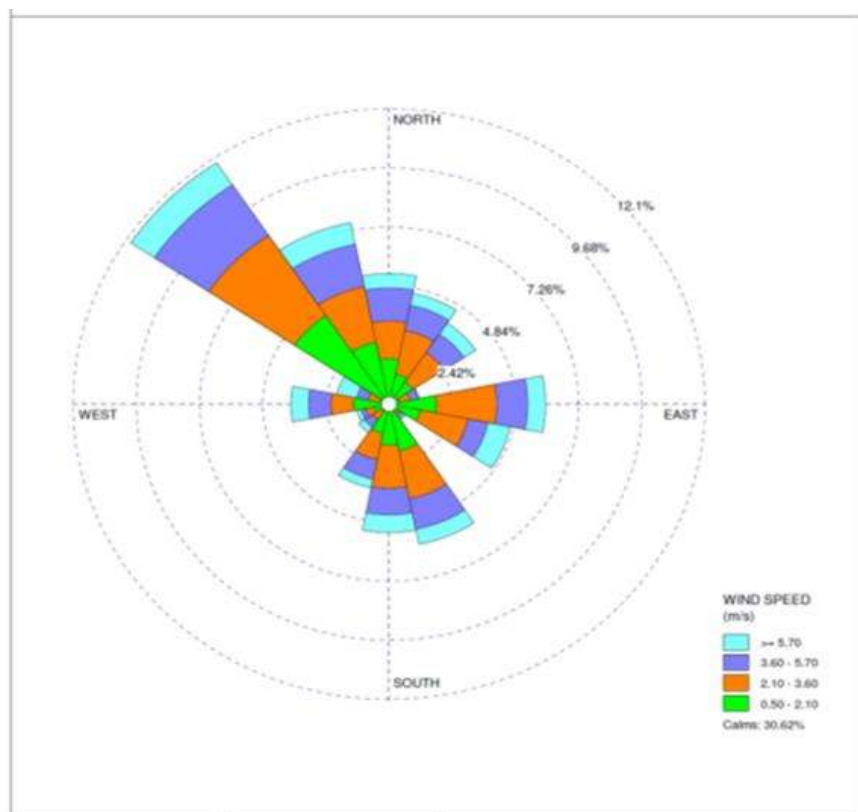
The Predicted maximum Ground level concentration of 24 Hour average PM, SO₂ and NO_x concentrations considering 24 hour mean meteorological data of study season are superimposed on the maximum baseline concentrations obtained during the study period to estimate the post project scenario, which would prevail at the post operational phase. The wind rose diagram & overall scenario with predicted concentrations over the maximum baseline concentrations is shown in **Table 4.2** and isopleths are shown in the **Figure 4.1 to 4.4**.

TABLE 4.1- STACK EMISSIONS DETIALS

Details	Incinerator
Capacity	200 kg/hr
Type of fuel	HSD
Height of the stack (m)	30
Temp of flue gas (°C)	120
Internal Dia. of the stack (m)	0.85
Velocity of flue gas (m/s)	16.5
Flue gas Flow rate (m ³ /s)	9.35
PM Emissions (g/s)	0.42
SO ₂ Emissions (g/s)	1.53
NO _x Emissions (g/s)	3.12

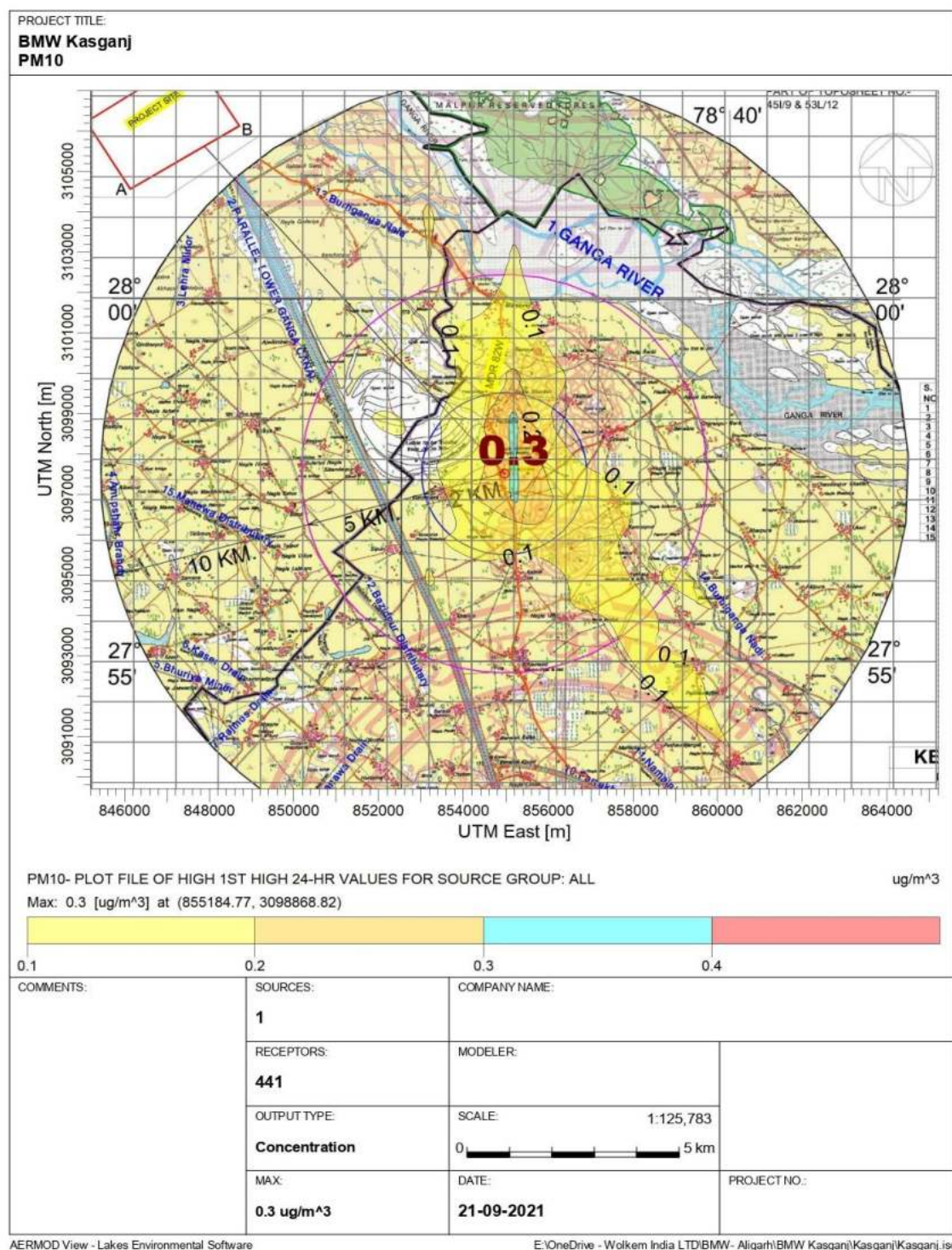
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FIGURE 4.1: WIND ROSE DIAGRAM

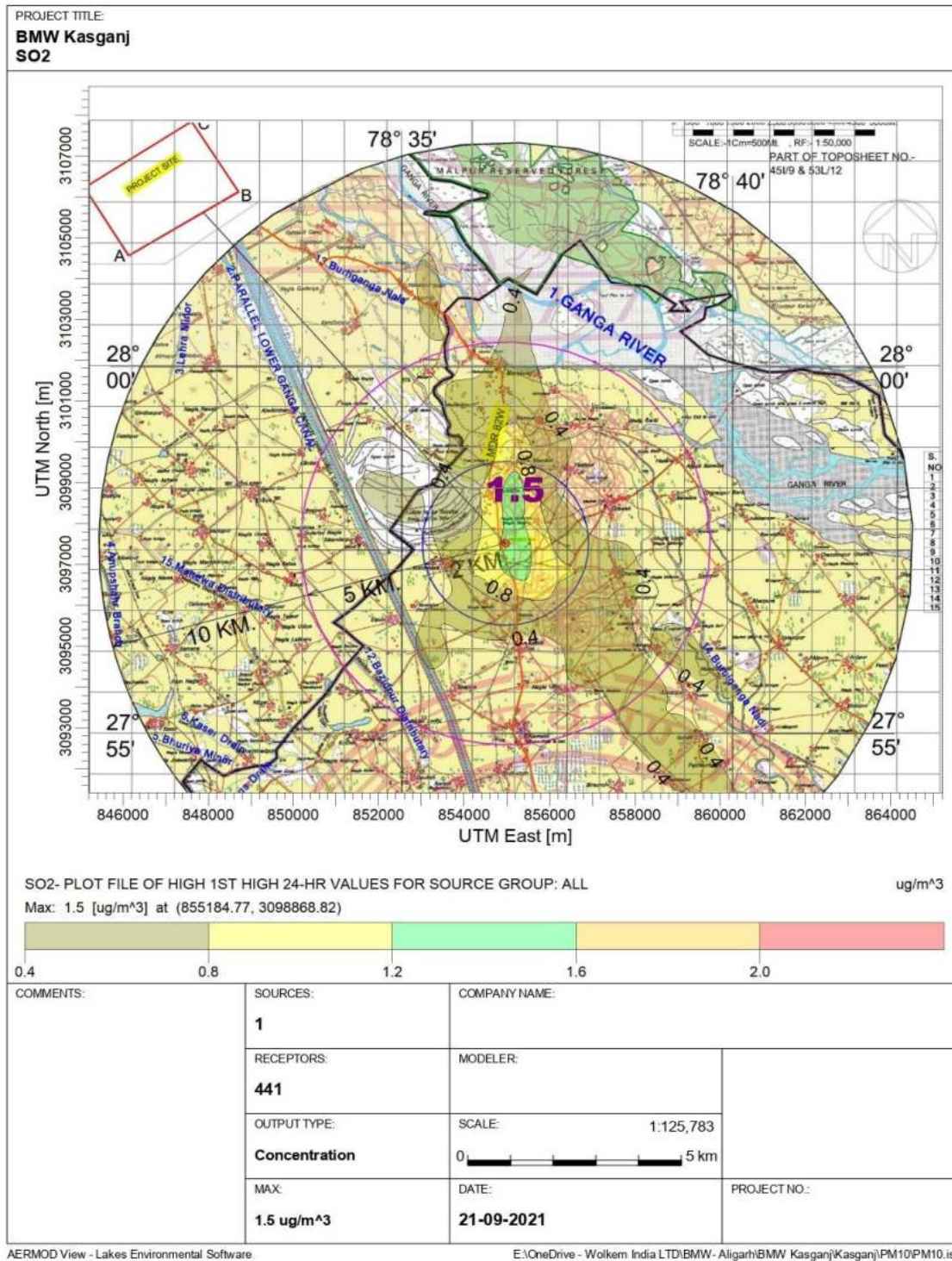
TABLE 4.2- POST PROJECT SCENARIO- UNITS: $\mu\text{g}/\text{m}^3$

Particulars	Particulate Matter (PM)	Sulphur dioxide (SO_2)	Oxides of Nitrogen (NO_x)
Baseline Scenario (Max)	94.81	15.69	18.63
Predicted GLC (Max)	0.3	1.5	2.9
Overall Scenario (Worst Case)	95.11	17.19	21.53
NAAQ Standards 2009	100	80	80

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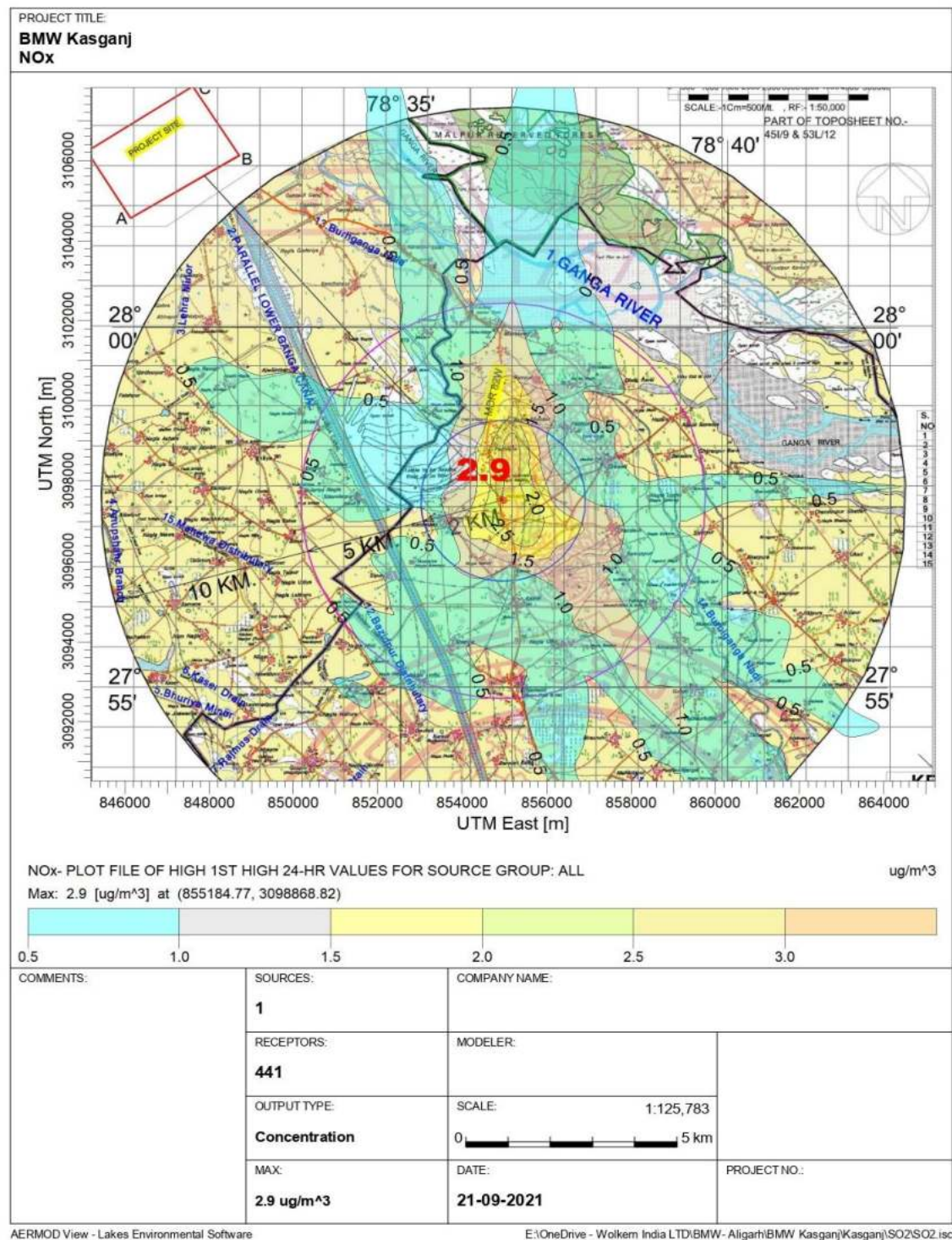
FIGURE 4.2: PREDICTED GLCs of PM ($\mu\text{g}/\text{m}^3$)

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FIGURE 4.3: PREDICTED GLCs of SO₂ (µg/m³)

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FIGURE 4.4: PREDICTED GLCs of NO_x (µg/m³)



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Mitigation Measures

The major air pollutants generated from the proposed project are given below.

- Dust particulates in flue gas
- Sulphur dioxide (SO₂) in flue gas
- Nitrogen oxides (NO_x) in flue gas

Incinerator: Incinerator will be provided with a stack height meeting MoEF&CC guidelines (minimum 30m), quencher, venturi scrubber, and alkaline wet scrubber. Potential pollutants and respective pollution control devices are as listed below:

Dioxins: To prevent reformation of dioxins by rapidly lowering the flue gas temperatures, particularly from 500°C to less than 200°C by adopting rapid quenching

Mercury: If the feeding waste contains mercury and its compounds, activated carbon treatment for control of these emissions is given, as necessary to meet the emission standards prescribed in Bio-Medical Waste Management Rules, 2016 and its subsequent amendments.

Particulate Matter: A venturi scrubber shall be put in place (after quencher) to remove particulate matter.

Mist: Often there is a need to eliminate the mist in the stack emissions, therefore, where necessary de-mister may be provided.

HCl Emissions: A wet alkaline scrubber will be provided to remove HCl emissions. Caustic soda solution shall be injected in wet alkaline scrubber for neutralization/removal of HCl.

Gases: For proper dispersion of Sulphur dioxide & Oxides of Nitrogen emissions from the incinerator stack height meeting MoEF&CC/CPCB guidelines will be provided for proper dispersion into atmosphere.

4.4.2 Impact on Water Quality

The water demand of the project will be met through borewell. To minimize the water consumption; water saving options will be planned

- Improve energy efficiency of operations
- Eliminate leaks of the pipelines
- Rain water holding tanks
- Treatment and reuse of Wastewater

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TABLE 4.3- WASTE WATER GENERATION DETAILS

S. No.	Activity	Fresh Water (Requirement)	Treated Water (Requirement)	Discharge to ETP
1.	Floor, Vehicle, wheel Washing, Water Sprinkling	1.4KLD	0.7 KLD	1.9 KLD
3.	Blow down	0.1 KLD	-	0.08 KLD
4.	Domestic use	2 KLD	-	Sent to Soak Pit/Septic Tank
5.	Gardening	1.5 KLD	1 KLD	-
Total		5 KLD	1.7 KLD	2 KLD

Mitigation Measures

Wastewaters including vehicle and container washing, floor washing, incineration, recycling plants shall be treated at ETP. The domestic wastewater will be sent to septic tank followed by soak pit for the safe guard of water environment. The treated waste water shall be used for greenbelt development and washing purpose within the plant premises.

Storm water drains shall be provided throughout the facility taking topography into consideration. The storm water drains are connected to rain water collection chamber. The rain water thus collected shall be used for greenbelt, vehicle washing etc., after treatment, if necessary.

4.4.3 Impact on Noise Environment

The major source of noise in proposed project will be from unloading of bio-medical waste and use of Incinerator, DG set, pumps, motors etc.

Mitigation Measures

Adequate measures for noise control, at the design stage shall be taken such as keeping high noise generating equipment's like pumps, motors, etc., on anti-vibration pads, closed rooms and regular maintenance as suggested by the manufacturer. Some of the mitigation measures proposed is as below

- 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, helmets, safety shoes, etc.
- Development of greenbelt all along the boundary and along the roads within the project.

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4.4.4 Impact on Land Environment

Waste such as incineration ash generated in the process of incineration shall be stored in a separate area under the shed so as to avoid entry of rain water during the monsoon and for easy collection and in case, incineration ash is hazardous in nature and the same shall be disposed by sending it to TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi(VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101.

4.4.5 Impact on Socio Economic & Mitigation Measures

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 public transport, water supply, telecommunications, education and public wealth are likely to improve.

4.4.6 Impact on Ecology and Mitigation Measure

Impact on Flora and Fauna during operation Phase

1. Spillages and leakages of BMW waste during transportation.
2. Penetration of leachate in the surface area during storage, handling and disposal of solid waste and hazardous waste.
3. Leakage or spillage of effluent material in the surface area.
4. Emission of various pollutants due to Incineration of Bio Medical wastes. Due to this activities air quality may be affected which is not good for breath for flora and fauna of the area.
5. Disposal of Hazardous waste and air pollution control failures:- Penetration of leachate in the surface area during storage, handling and disposal of solid waste and hazardous waste.
6. Leakage or spillage of effluent can cause site-specific short-term disturbance of subsoil fauna.
7. Generation of PM_{2.5}, PM₁₀ and emission of SO₂ & NO_x due to vehicular movement, during operation of Incineration and DG sets. Deposition of dust particulate on leaves may reduce the rate of photosynthesis by plants. It is major Impact on the flora of the surrounding area. Minor Impact on surrounding Flora, Fauna and biodiversity of the area.
8. Generation of wastewater from ETP and STP plant, plant activity will not deteriorate groundwater quality because no toxic element will be mixed into groundwater as well as surface water.
9. Noise and Vibration generation due to all BMW activities. Due to activities worker working

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efficiency and hearing capacity will be slightly reduced. Its site specific and major impact on plant workers.

10. Due to BMW activity's pollution load (SO_2 & NO_x) will be increase in the 1-2 Km radius.

Mitigation Measures

- Proposed planation (greenbelt development) with suitable native species as per CPCB guidelines will help to mitigate likely cumulative impacts by absorbing pollutants like CO_2 , SO_2 , NO_x etc.
- Plantation in safety zone will also protect the soil from wind erosions.
- Water sprinkling wshall be carried out regularly; so as to avoid fugitives dust formation and deposition of same on plantation.
- Proper fencing will be provided and maintained at the boundary to avoid any animals at proposed project site.
- Proper and timely maintenance of machines and transport vehicle will help to check and reduce sound nuisance.
- The wastewater generated shall be treated and resued within the premises for greenbelt development & floor, vehicle washing purposes. Thus, proposed plant is zero liquid discharge plant.
- Emission levels of NO_x and SO_2 all pollutants will be kept within CPCB permissible levels through various engineering control measures.
- All pollutants will be kept within CPCB permissible limits, considering impact, minor short-term impacts are expected on surrounding flora and fauna.
- The emission levels of emitted pollutants will remain in permissible limits due to use of PUC certified vehicles complying vehicular emissions norms, considering cumulative impact, minor short-term impacts are expected on associated biodiversity.

Conclusion: - The major and minor impact of the project activities will be minimal on the ecological and biological of the environment. Forthcoming environmental impacts due to air pollution, water pollution, Soil pollution and land pollution and other activities, it is advisable to increase green belt planation in the project area and buffer zone available land so that the local faunal and floral biodiversity may increase.

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CHAPTER-V

ANALYSIS OF

ALTERNATIVE

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CHAPTER-V

ANALYSIS OF ALTERNATIVES

5.1 Introduction

The Proposed project is going to be established at Kumraua village, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh. The proposed project site is meeting guidelines of CBWTF issued by MoEF&CC.

5.1.1 Alternative Site Analysis

One alternative site was examined for setting up Common Bio-medical Waste Treatment Facility at Village - Vishanpur, Tehsil- Iglas, Aligarh, Uttar Pradesh. This Aligarh site was falling under 75 km radius of existing CBMWTF at Mathura. Hence, the Aligarh site is not meeting siting criteria as per BMW Rules 2016.

Therefore, another site is been proposed and considered at Kumraua village, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh for proposed Common Bio-medical Waste Treatment Facility which meets above criteria with the guidelines of MoEF&CC/CPCB/UPPCB/CPHEEO.

5.1.2 Site Selection

Environmentally sound management of biomedical wastes would require common bio medical waste management facilities for health care facilities spread all over the country, as it is not possible to have waste management facility for each unit. Hence common facilities become more necessary in the wake of our country, which either have no funds or space for development of biomedical waste management facility.

The proposed project is going to be established near Kumraua village and the proposed land was taken on lease for 15 years by Mr. Raman Kumar, partner of M/s Indo Tech Waste Solution. Currently, proposed land has been applied for conversion for industrial land use to establish the proposed common bio-medical waste treatment facility via Revenue Council Uttar Pradesh online portal case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amendment 2016) section 80 (1) on dated; 11.10.2021. The proposed project site is meeting site selection criteria of MoEF&CC/CPCB/CPHEEO guidelines as well as the stringent site selection criteria of TSDF's.

- Areas with unstable geological features like unstable or weak soil, soft clay or clay-sand mixture, soil that strength with compaction or with wetting, clays with a shrink-swell character, sand subjected to subsidence and hydraulic influence.

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- Subsidence: e.g owing to subsurface mines, water, oil or gas withdrawal or solution prone subsurface.
- Wet lands.
- Historical migration zone.
- Flood prone areas
- Area with 500 m from water supply zone and within 200 m from property line
- Natural depression and valleys where water contamination is likely
- Areas of ground water recharge and extremely high water table zone
- Unique habitation areas, close to national parks with scenic beauty and formerly used landfills.
- Areas with high population, unique archaeological, historical, paleontological and religious interests.
- Agricultural and forests lands and existing dump sites.
- Atmospheric conditions that would prevent safe disposal of an accidental release.
- Major natural hazards, e.g. volcanic activity, seismic disturbance, etc.
- Sensitive locations, e.g. storing flammable or explosive materials, airports.
- An unfavorable local hydro-geological situation, e.g. springs or drinking water well within very close proximity to the chosen area.
- Extremely bad access i.e. no existing access roads to the selected site which may be involved.
- Long distance more than 5 km from main roads.
- Great differences in altitude between the area of waste collection and the selected site.

Site selection criteria for the proposed project as per MoEF&CC/CPCB/CPHEEO guidelines are given in Table No- 5.1

TABLE-5.1 SITE SELECTION CRITERIA FOR THE PROPOSED PROJECT

S.No.	Parameters	Criteria	Description of the Proposed Site
1	Lake/Pond (Distance from SW body)	Should not be within 200 m	No water body located in site.
2	River/Streams	Should not be within 100 m	No river within 100m of site. Paraller Lower Ganga Canal at 2.93km W direction & Ganga River at 4.31 km N direction
3	Flood Plain	Should not be within a 100 year flood plain	Not a 100 year flood plain area

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4	Highways – National or State	Should not be within 500 m	No NH/SH within 500 m. MDR 82W is 0.07 km at W direction
5	Habitation – Notified Habituated Area	Should not be within 500 m	No habitation within 500m from the proposed site area. Nagla Mukhram 802 meter in NE and Pachlana 1 Km in NNE.
6	Public Parks	Should not be within 500 m	There are no public parks within 500 m.
7	Critical Habitat Area – It is defined as the area in which 1 or more endangered species live	Not Suitable	The proposed site is not within critical habitat area.
8	Wet Lands	Not Suitable	Not a wet land
9	Airports	Should not be within zone around the airport	Agra Airport is the nearest airport at an aerial distance of 110 km in SW direction.
10	Water Supply Schemes/Wells	No water supply well within 500 m.	No Water Supply Schemes/ Wells located within 500 m.
11	Coastal Regulation Zone (CRZ)	Not Suitable	The proposed site is not within coastal regulation zone.
12	Ground Water Table level	GW table should be >2 m from the base of the landfill.	No landfill is proposed.

5.2 Biomedical Waste Treatment, Storage & Disposal Options

Waste treatment can be effectively performed by two operations running parallel to each other.

Treatment/ storage and disposal of the wastes have various options available are:

- I. A Disinfecting Unit
- II. A Destruction Unit

A Disinfecting unit is one that will effectively kill all the microorganisms. Autoclaving, Microwaving, Hydroclaving and chemical disinfection processes are the most prevalent technologies used for disinfection of pathogens from the bio-medical wastes.

Autoclave is used for the purpose of bio-medical waste management and is expected to operate under standards specified by MoEF&CC. Medical wastes shall not be considered treated unless the time, temperature and pressure indicated in the standards are reached (for eg. 121°C, 15 psi for 1 hour for normal autoclave).

Microwave and Hydroclave disinfection units are similar in application to that of an autoclave. Microwave technology cannot be applied for cytotoxins, hazardous or radioactive wastes, contaminated animal carcasses, body parts and large metal items. Microwave shall completely and consistently kill the bacteria and other microorganisms. Chemical disinfection is a process of

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disinfection wherein chemical disinfectants like chlorine and its derivatives or other disinfectants are used in a closed process to attain complete killing of the pathogens.

A Destruction unit is one that will completely destroy the wastes into safe end products. High temperature incinerators are used to achieve this. Incineration is a process by which combustible materials are burnt, producing combustion gases and non-combustible residue and ash. The combustible gases are vented into the air after treatment through air pollution control devices. Ash and other non-combustible residue remain after the destruction/ incineration process and are disposed in nearest TSDF.

Dry Static Incinerators:

The new incinerator installations in India are being done by us using Dry Scrubbing Technologies which is the optimum technology designed to meet the stringent emission standards and also ensuring zero waste water discharge. The new dry technology incinerators are the most advanced incineration technology in the world. High levels of automation, variable frequency drives at all critical points to ensure the finest adjustments of chemicals for injection in the system to control the pollutant gases for complying the stringent norms in the country.

Waste Storage is an applicable option for effective storage of certain hazardous wastes like mercury and cytotoxins that do not have a cost-effective treatment technology as yet. Its disposal is primarily performed by deep burial of wastes.

Waste disposal is an option which remains to exist irrespective of the treatment options, in case of disinfection waste material post-disinfection and incineration the non-combustible residue and ash needs to be disposed off to nearest TSDF.

5.3 Alternative Treatment Technologies

5.3.1 Incineration

Incineration is a controlled combustion process where waste is completely oxidized and harmful microorganisms present in it are destroyed /denatured under high temperature. The incinerator for operation in CBWTF shall meet and follow all the design requirements as per Schedule II of the Bio-medical Waste Management Rules, 2016 and its subsequent amendments & CPCB/UPPCB Guidelines.

5.3.2 Plasma Pyrolysis

Plasma Pyrolysis treatment technology can be installed for disposal of bio-medical waste wherein waste is treated at high temperature under controlled condition to form gases like methane,

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hydrogen and carbon monoxide which are subjected to combustion (oxidation) in secondary chamber. In this process waste is converted into small clinker which can be disposed in secured landfills.

Plasma pyrolysis technology requires technical persons for operation and is very expensive. Hence incineration technology has been adopted meeting all the emission standards as per Bio-Medical Waste Management Rules 2016 and its subsequent amendments.

5.3.3 Microwaving

In microwaving, microbial inactivation occurs as a result of the thermal effect of electromagnetic radiation spectrum lying between the frequencies 300 and 300,000 MHz. Microwave heating is an inter-molecular heating process. The heating occurs inside the waste material in the presence of steam.

5.3.4 Hydroclaving

Hydroclaving is similar to that of autoclaving except that the waste is subjected to indirect heating by applying steam in the outer jacket. The waste is continuously tumbled in the chamber during the process.

Over the years of industrial experience it is identified that the overall performance of autoclave is consistent and less expensive compared to Microwaving and Hydroclaving.

5.3.5 Chemical Disinfection

Though chemical disinfection or alternates as stipulates under the BMW rules is also an option for treatment of certain categories of bio-medical waste such as glass water but looking at the volume of waste to be disinfectants, the chemical disinfection for treatment of bio-medical waste as part of a CBWTF may be used sparingly or avoided as far as possible.

5.3.6 Shredder

Shredding is a process by which waste are de-shaped or cut into smaller pieces so as to make the wastes unrecognizable. It helps in prevention of reuse of bio-medical waste and also acts as identifier that wastes have been disinfected and are safe to dispose off.

5.3.7 Sharp pit/Encapsulation

A sharp pit or a facility for sharp encapsulation in a metal container or cement concrete shall be provided for treated sharps (i.e., treatment by autoclaving or dry heat sterilization followed by shredding or mutilation). An option may also be worked out for recovery of metal from treated

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and shredded waste sharps within the CBWTF or iron foundries having consent to operate from the SPCBs/PCCs and located nearby, as per the conditions imposed in authorization granted under BMWM Rules by the SPCB/PCC.

A sharp pit may be of circular or rectangular shape and shall be dug and lined with cement plastered brick masonry or concrete rings. The pit should be covered with a heavy concrete slab with a provision of galvanized steel pipe projecting about 1.5 meters above the slab, with an internal diameter of up to 50 mm or 1.5 times the length of vials, whichever is more. The top opening of the steel pipe shall have a provision of locking after the treated waste sharps are disposed into the sharp pit. When the pit is full, it can be sealed completely, after another pit is prepared. In case of high water table regions (i.e., where water table is less than 6 metres beneath the bottom of the sharp pit), a tank with above mentioned arrangements shall be made above the ground.

5.4 Advantages of CBWTF over Individual Facilities at HCEs

The bio-medical waste management facility would be most effective if incorporated as a common facility with a disinfecting unit, a destruction unit and a disposal unit. The options for locating such a unit shall have a common facility that will cater to a group of hospitals or an inbuilt facility within every hospital, having a common management system.

The advantages of a common facility over inbuilt facility in each of the components of waste management are elaborated below:

- **Waste minimization** would require the same effort in both the options.
- **Collection and Transportation** of the wastes would be minimal for an inbuilt facility compared to that of a common facility.
- **Efficient management** and treatment options would be low in inbuilt facility as this would require a group of trained professionals to handle.
- **Social Acceptability** for inbuilt facility is very low, as most of the hospitals are located in the heart of the residential areas with high population density. The prevalent concept of NIMBY (Not in my Backyard) further decreases the level of social acceptability. As a centralized facility would be located away from residential areas having low population density, it would be more acceptable.

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- Impacts on Human Health and the Environment would be much higher in case of inbuilt facilities as the number of individuals exposed to the various pathways would be much higher, while at the common facility it is really low.
- **Commercial Aspects** can be broadly grouped into capital and operational costs. The capital costs would be significantly higher in the case of inbuilt facility. Installation of a Common bio-medical waste management facility would incur a capital cost that would not be commercially viable for most institutions. The operating cost would also be higher at the inbuilt facility as this would require professional supervision and manpower and the actual operating cost of the machinery. A holistic view of the bio-medical waste management clearly indicates that operations of such waste management facilities should be left to trained professionals for a safe and better disposal.

5.5 Technology Adopted

M/s. Indo Tech Waste Solution is proposing the most feasible combination of technology option recommended for the CBWTF at Village- Kumraua, Block- Saron District- Kasganj, Uttar Pradesh based on the quality, quantity of waste to be processed, land availability (limited in the area), capital cost and maintenance cost and meeting & following BMW rules 2016 and its subsequent amendments as well as CPCB/UPPCB guidelines are Dry Statist Incinerator using dry scrubbing technology, Autoclave & Shredder and also including ETP for maintain zero liquid discharge plant. Ash and other non-combustible residue remain after the destruction/ incineration process which shall be disposed in nearest TSDF.

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CHAPTER-VI

ENVIRONMENTAL

MONITORING

PROGRAMME

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CHAPTER – VI

ENVIRONMENTAL MONITORING PROGRAMME

6.1 Introduction

Environmental monitoring describes the processes and activities that need to take place to characterize and monitor the quality of the environment. It checks efficiency of mitigation measures and changes in environment over period of time.

The objectives of environmental monitoring program are;

- To verify the results of the impact assessment study in particular with regard to new development;
- To follow the trend of parameters which have been identified as critical;
- To check or assess the efficiency of the pollution control measures;
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical through the commissioning of new installations;
- To check assumption made with regard to the development and to detect deviations in order to initiate necessary measures; and
- To establish a database for future Impact Assessment Studies for new projects.

The monitoring program will have three phases

1. Construction phase
2. Monitoring phase

6.2 Construction Phase

The proposed project envisages setting up of Proposed Common Bio-Medical Waste Treatment Facility at Kumraua village, Soron Block, Tehsi & District Kasganj, Uttar Pradesh, the major construction activities involved in setting up the unit are construction of sheds for treatment units, stores, administrative blocks etc., major components in the industry are incinerator, autoclave, shredder, diesel generator, and other civil, mechanical and electrical equipment. The construction activities require clearing of vegetation, mobilisation of construction material and equipment. The construction activities are expected to last for few months.

During construction phase of the CBMWT facility at every stage quality of construction will be monitored viz. base preparation, installation of equipment. The generic environmental measures that need to be undertaken during project construction stage are given in the following **Table 6.1**.

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TABLE 6.1 ENVIRONMENTAL CONTROL MEASURES DURING CONSTRUCTION SITE

S. No.	Potential Impact	Detailed actions to be followed as per EMP	Parameters for Monitoring	Frequency of Monitoring
1.	Air Emissions	All equipments are operated within specified design parameters.	Random checks of equipment logs/manuals	Periodic
		Vehicle trips to be minimized to the extent possible	Vehicle logs	Periodic during site clearance & construction activities
		Waster Sprinkling to avoid fugitive dust	PM ₁₀ PM _{2.5}	As per CPCB/ SPCB requirements
		Any dry, dusty materials stored in sealed containers or prevented from blowing.	Stockpiles or open containers of dusty materials.	Periodic during construction activities
		Compaction of soil during various construction activities	Construction logs	
		Maintenance of construction DG set emissions to meet stipulated standards	Gaseous emissions (SO ₂ , HC, CO, NO _x)	Periodic emission monitoring
		Ambient air quality within the premises & adjacent villages of the proposed unit to be monitored.	PM ₁₀ PM _{2.5} , SO ₂ , NO _x , and CO	As per CPCB/ SPCB requirements
2.	Noise	List of all noise generating machinery onsite along with age to be prepared.	Equipment logs, noise reading	Regular during construction activities
		Night working is to be minimized.	Working hour records	Periodic during construction activities
		Generation of vehicular noise	Maintenance of records of vehicles	
		Implement good working practices (equipment selection and siting) to minimize noise and also reduce its impacts on human health (ear muffs, safe distances, and enclosures).	Site working practices records, noise reading	
		No machinery running when not required.		
		Acoustic mufflers / enclosures to be provided in large engines	Mufflers / enclosures shall be in place.	Prior to use of equipment.
		Noise to be monitored in ambient air within the plant premises.	Instant Noise recording	As per CPCB/SPCB requirements
		The Noise level will not		

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S. No.	Potential Impact	Detailed actions to be followed as per EMP	Parameters for Monitoring	Frequency of Monitoring
		exceed the permissible limit both during day and night times.		
		All equipment's operated within specified design parameters.	Random checks of equipment logs/manuals	Periodic during construction activities
		Vehicle trips to be minimized to the extent possible	Vehicle logs	
3.	Wastewater Discharge	No direct discharge of wastewater to be made to surface water, groundwater or soil. As the plant is proposed as zero liquid discharge.	No discharge hoses shall be in vicinity of watercourses.	Periodic during construction activities
		The discharge point would be selected properly and sampling and analysis would be undertaken prior to discharge.	Discharge norms for effluents as given in Permits	Periodic during construction activities
		Take care in disposal of wastewater generated such that soil and groundwater resources are protected.	Discharge norms for effluents as given in permits	
4.	Soil Erosion	Minimize area extent of site clearance, by staying within the defined boundaries	Site boundaries not extended / breached as per plan document.	Periodic during construction activities
		Protect topsoil stockpile	Effective cover in place.	Periodic during construction activities
5.	Drainage and effluent Management	Ensure drainage system and specific design measures are working effectively. The design to incorporate existing drainage pattern and avoid disturbing the same.	Visual inspection of drainage and records thereof	Periodic during construction activities
6.	Waste Management	Implement waste management plan that identifies and characterizes every waste arising associated with proposed activities and which identifies the procedures for collection, handling & disposal of each waste arising.	Comprehensive Waste Management Plan should be in place and available for inspection on-site. Compliance with Bio-Medical Wastes (Management and Handling) Rules	Periodic check during construction activities

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S. No.	Potential Impact	Detailed actions to be followed as per EMP	Parameters for Monitoring	Frequency of Monitoring
			2016, under the aegis of Environment (Protection) Act, 1986.	
7.	Non-routine events and accidental releases	Plan will be drawn, considering likely emergencies and steps required to prevent / limit consequences.	Mock drills and records of the same	Periodic during construction activities
8.	Health	Employees and migrant labour health check ups	All relevant parameters including HIV	Regular checkups as per Factories Act

6.3 Operational Phase

During operational phase air emissions from incinerator, DG set and other process if any, 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 characterisation (Ash, leachate treatment plant & Septic tank/soak pit sludge);
- Soil quality;
- Noise levels (equipment and machinery noise levels, occupational exposures and ambient noise levels); and
- Ecological preservation and afforestation.

TABLE 6.2 ENVIRONMENTAL MONITORING DURING OPERATIONAL PHASE

S. No	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
	Air Emissions	Stack emissions from Incinerator	Temperature, Pressure, CO, Excess Oxygen, Particulates, HCl, SO ₂ , NO _x ,	Continuous Monitoring
			HF, TOC	Once in Month
			Mercury, Heavy metals, dioxins & furans	Twice in a year

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S. No	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
		Stack emissions from DG sets	As per CFE conditions PM, SO ₂ , NO _x	As per CFE conditions
		AAQ within the project premises and adjacent areas (3 places at 120°) to be monitored. All vehicles to be PUC certificate.	As per CFE conditions / NAAQ Standards Vehicle logs to be maintained	As per CFE conditions
		Meteorological data	Wind speed, direction, temp., relative humidity and rainfall.	
2.	Noise	Noise generated from operation of boiler, cooling towers, etc to be monitored	Spot Noise Level recording;	Periodic during operation phase Once in month by third party
3.	Wastewater Discharge	Compliance to wastewater discharge standards and maintaining zero liquid discharge.	pH, TSS, TDS, BOD, COD & Oil & grease (Heavy metals if required)	Daily at regular intervals Once in a month by third party
4.	Solid waste/ Hazardous Waste	Check compliance to HWM rules	Quality & quantity monitoring	Periodically / CPCB norms.
5.	Ground Water Quality	Monitoring ground water quality, around plant site and piezometers	Comprehensive monitoring as per IS 10500 Groundwater level BGL	Periodically & as per CPCB norms.
6.	Flora and fauna	Vegetation, greenbelt / green cover development	No. of plants, species	Once a year
7.	Soil quality	Checking & Maintenance of good soil quality around	Physico-chemical parameters and metals.	Once a year
8.	Health	Employees and migrant labour health check ups	All relevant parameters (BP, Sugar, chest X-ray, Eye vision, etc.)	Regular checkups as per factories act.

6.4.1 Pollution Monitoring Facilities

Incinerator stack, DG set stack should have provision of platform and port hold to stack sampling meeting MoEF&CC standards with necessary power point. Sampling and Analysis of air, water etc., will be given for third party monitoring (MOEF Accredited laboratories). The appointed Environmental laboratory shall have above equipment/instruments to analyze air and wastewater parameters.

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6.4.2 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 six monthly bases to the local state PCB officials and to Regional office of MoEF&CC. The Environmental Audit reports shall be prepared for the entire year of operations and shall be regularly submitted to regulatory authorities.

6.5 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
- 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 on a regular basis.

6.6 Budgetary Provision for EMP

In order to comply with the environmental protection measures as suggested in the above section, a budgetary provision for Environmental Protection is given in:

TABLE-6.4 BUDGET OF IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLAN

S. No.	Particulars	Capital Cost (Rs) lakhs	Recurring Cost (Rs) lakhs/annum
1	Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc	20	5
2	Odor and Noise Control Measures	5	2
3	Landscaping and Greenbelt Development	5	2
4	Storm Water Drains & Storage Tanks	2	2.5
5	Ambient Air Monitoring & Online Stack Monitoring	10	0.5
6	Ash Disposal	1	4
7	Health Care (Performing free Cataract surgeries, Infrastructure support to area Govt. Hospitals like providing bed and equipment for treatment etc.) COVID financial assistance	0.85	0.10

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8	Promoting Education (providing infrastructure like construction of additional class rooms, furniture, smart class facilities, support to special children education /therapy etc. in nearby village)	0.85	0.10
9	Environment care (taking up avenue plantation, Plantation in communities, providing solar power/ lights, rain water harvesting etc.)	0.85	0.10
10	Rural Development (laying roads, construction of drains, community halls, other infrastructure for development of surrounding villages)	0.85	0.10
Total		46.4	16.4

The proposed capital cost for the project is INR 1.72 Crores and total investment on environmental improvement i.e EMP works is envisaged Rs. 46.4 lakhs/- and recurring expenditure during the stage of operation is Rs. 16.4 lakhs/- as recurring investment is earmarks for EMP.

As per the directions given in the MoEF&CC Office Memorandum, F.No. 22-65/2017-IA-III on 30th September 2020, all the proposed activities will be part of Environmental Management Plan (EMP) instead of CER.

Addition to above the project proponent has proposed to invest amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project.

TABLE-6.5 BUDGET BREAK UP FOR LABOUR

S. No.	Activity	Budget (in lakhs/Year)
1.	Safe Drinking Water	0.50
2.	Urinal , Latrine and Bathrooms	1.00
3.	PPE and Safety equipment will be Provided	0.20
4.	First Aid facility	0.20
5.	Regular Health checkup and provision of medicine	0.35
6.	Educational and awareness programme for safety measures & Recreational program	0.30
Total		2.55

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CHAPTER-VII

ADDITIONAL

STUDIES

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CHAPTER - VII

ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

7.1.1 Introduction

Risk Assessment policies are essential tools to prevent and mitigate undue harm to people during the development process. When identifying and designing a project, Risk Assessment helps assess the potential physical, environmental and social risks and impacts (Positive and Negative) associated with a development intervention.

A hazard is something that can cause harm, viz., chemicals, electricity, working on height, noise due to machines/ running of plant, work stress etc. However, risk is the chance or the scale say high or low that any hazard will actually cause somebody harm.

7.1.2 Evaluation Hazard

The need for the sophisticated techniques for evaluating hazards depends on the result of Preliminary Hazard Analysis. Various techniques for evaluation hazards are: Hazard and Operability Study (HAZOP) Physical Hazards

- Accident Consequence Analysis
- Event Tree Analysis
- Fault Tree Analysis
- Failure Modes, Effects and Criticality Analysis

TABLE 7.1 HAZARD IDENTIFICATION

S. No.	Toxicity	Oral Toxicity LD50 (mg/kg)	Dermal Toxicity LD50 (mg/kg)	Inhalation Toxicity LD50(mg/kg)
1	Highly Toxic	1-50	1-200	0.1-0.5
2	Extremely Toxic	51-500	201-2000	0.5-2.0

In order to be in a state of readiness to face the adverse effects of accidents, an Emergency Preparedness Plan (EPP) has to be prepared. Such a plan must. Inter-alia, cover the possible hazardous situations in the locality and the causes, areas most likely to be affected, on-site and off-site plans, establishment of Emergency Control Centers(ECC), location of emergency services and duties of officers/staff during emergency. The EPP document for accidents is to be designed to provide for measures to contain the incident and for minimization of effects due to fire, explosives, release or escape of toxic gas, spillage of hazardous substances in storage, processing or during transportation. The necessary preventive and protective steps required to be taken before, during and after an accident need to be worked out in operational terms and detailed in the document.

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7.1.3 Identification of Toxic, Flammable, Explosive Chemicals

Toxic Chemicals: Chemicals having the following values of acute toxicity and which owing to their physical and chemical properties are capable of producing major accidents:

Flammable Chemicals: Flammable gases: Gases which at 200°C and at standard pressure of 101.3 KPa are:-

Ignitable when in a mixture of 13 percent or less by volume with air, or have a flammable range with air of at least 12 percentage points regardless of the lower flammable limits.

Note: -The flammability shall be determined by tests or by calculation in accordance with methods adopted by International Standards Organization ISO Number 10156 of 1990 or by Bureau of Indian Standards ISI Number 1446 of 1985.

Extremely flammable liquids: chemicals which have flash point lower than or equal to 23°C and boiling point less than 35°C

Very highly flammable liquids: chemicals which have a flash point lower than or equal to 23°C and initial boiling point higher than 35°C.

Highly flammable liquids: chemicals which have a flash point lower than or equal to 60°C but higher than 23°C.

Flammable liquids: chemicals which have a flash point higher than 60°C but lower than 90°C.

Explosives: Explosives means a solid or liquid or pyrotechnic substance (or a mixture of substances) or an article.

This is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings;

7.2 ON-SITE EMERGENCY PLAN

An onsite emergency is caused by an accident or hazard that takes place within the plant area and the effects are confined to the plant area. The onsite emergency plan consists of following key elements:

- Planning as per hazard analysis
- Preventive measures
- Emergency response procedure
- Recovery procedure

7.2.1 PLANNING

1. Mapping of hazard vulnerable area.
2. There shall be Disaster Management Cell in place.
3. The disaster management cell have following members to share the responsibility:

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- Site Controller (Administrator of complex)
- Incident Controller (Asstt. Administrator)
- Personal Manager
- Communication Officer
- Fire Officer
- Security Officer
- Engineering In-charge
- Fire pump attendant
- First Aid Team

7.2.2 EARTHQUAKE

The project is situated at Seismic zone-IV area. Special attention shall be given to the structural design of foundation, elements of masonry, timber, plain concrete, reinforced concrete, prestressed concrete, and structural steel. All applicable guidelines will also be followed in this regard to ensure safety of the building.

7.2.3 FLOODING

To avoid flooding or water logging in the area due to the existing nearby low lying area. All the rain water will be diverted to rain water / storm water drain and extra water will be diverted in storm line of area

7.2.4 FIRE AND LIFE SAFETY

Safety Precautions

1. Smoking must be prohibited.
2. Vehicle access should be strictly controlled.
3. Fuel tanks, packaged materials shall be kept in separate rooms.
4. Ventilation must be sufficient to cope with the maximum expected vapor levels in building.
5. Storage tank vents to atmosphere should be sized for fire-heated emergency vapor release.
6. Electrical equipment must be explosion-proof to meet national electrical code requirements.
7. Dry chemical extinguishers should be accessible for small fires. An adequate supply of hand-held and wheeled types should be available.
8. Hydrants should be strategically placed with adequate hoses.
9. Small spills should be remediated with sand, earth, or other non-combustible absorbent material, and the area then flushed with water. Larger spills should be diluted with water and dyked for later disposal.

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Precaution in case of Fire

- For proposed Common Bio-medical waste treatment, all practicable measures shall be taken to prevent outbreak of fire and its spreads, both internally and externally, to provide and maintain
 - Safe means of escape for all person in the event of a fire, and
 - The necessary equipment and facilities for extinguishing fire.
- Effective measures shall be taken to ensure that all the workers are familiar with the means of escape in case of fire and have been adequately trained in the routine to be followed in such cases.
- Fire Fighting Personal Protective Equipment.
- Due consideration must be given to hazards from chemical and heat exposure. Therefore, fire-fighters should wear full-face, positive pressure, self-contained breathing apparatus or an air-line. Chemical protection may be provided with impervious clothing, gloves and footwear. Suitable materials include polyvinyl plastic, neoprene or rubber.

7.2.5 CHEMICAL & HAZARDOUS MATERIAL

The only chemical used in the treatment is Sodium Hypo Chlorite (NaOCl) shall be used as disinfectant in Autoclaving. NaOCl is a highly reactive oxidizer. It is greenish-yellow in color with an odour similar to that of chlorine. Strength hypochlorite is often diluted prior to being injected into a water stream, in order to provide proper mixing and disinfection. When an insufficient amount of dilution water is used the hypochlorite can cause the pH to rise. If the dilution water is hard water, the rise in pH will result in calcium carbonate precipitation which will coat the inside of piping, valves and pumps. This scale deposit will tend to be greatest in areas of high turbulence. In order to prevent scaling use soft water. Besides it fuel HSD shall be used in Incinerator & D.G. Sets

Measures to be adopted while Chemical & Fuel Handling:

- Workers shall wash their hands thoroughly after handling.
- Fuels/chemicals shall be used only in a well-ventilated area.
- Workers shall use spark-proof tools and explosion proof equipment.
- Workers shall avoid contact with eyes, skin, and clothing.
- Container shall be kept tightly closed.
- Workers shall avoid contact with heat, sparks and flame.
- Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

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- Operator training as well as written operating instructions, safety rules and check lists shall be provided.

Protective protection:

Sources of Exposure -Human exposure to fuels can occur via absorption, contact with the eyes, inhalation or ingestion.

First Aid Measures

- In case of fuel come in contact with the skin, remove contaminated clothing. Wash with soap and water for 15 minutes. Seek medical attention if irritation occurs.
- In case of chemicals contact with the eyes, flush immediately with gently running water for a minimum of 15 minutes, ensuring all surfaces and crevices are flushed by lifting lower and upper lids. Obtain medical attention.
- In case of inhalation of chemical's vapour, remove the individual to fresh air, but only if it is safe to do so. Asphyxiation from vapour may require artificial respiration. Due to the possibility of delayed onset of more serious illness, it is important to obtain medical attention.
- Ingestion of chemicals is life threatening. Onset of symptoms may be delayed for 18 to 24 hours after ingestion. Do not induce vomiting. Transport to medical attention. The individual should remain under close medical care and observation for several days.

Chemical & Fuel Storage:

- Chemical/Fuel shall be kept away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container.
- Chemical/Fuel shall be stored in a cool, dry, well-ventilated area away from incompatible substances.
- Storage & handling area shall be readily accessible with safety showers, fire extinguishers and other fire-fighting equipment, water hydrants with spray nozzle and other emergency equipment such as chemical proof suits and respiratory apparatus.
- The flammable materials shall be stored in a separate safety storage room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well ventilated place.

Spills / Leaks: Spills will be absorbed with inert material (e.g. vermiculite, sand or earth), they will be placed in suitable container. All sources of ignition shall be removed and a spark-proof tool shall be used. Ventilation shall be provided and a vapour suppressing foam shall be used to reduce vapour.

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TABLE 7.2: LIST OF HAZARDOUS MATERIALS

S. No.	Name of the Hazardous substance	Place of storage	State and operating pressure & Temp	Type of hazards possible	Control measures Provided
1.	Yellow Category waste (Human anatomical waste, animal waste, soiled waste etc.)	Red storage room (plant area)	Ambient Condition	Fire, Infection	1] Fire Extinguisher (CO2,DCP) 2] PPE 3] sand Bucket 4] Emergency provision for FireBrigade from outside source. 5] PPE shall be provided
2.	Red category Waste (microbiology & Biotechnology waste, tubing, catheters, intravenous sets etc.)	Yellow storage room (plant Area)	Ambient Condition	Fire, Infection	1] Fire Extinguisher (CO2,DCP) 2] PPE 3] sand Bucket 4] Emergency provision for Fire Brigade from outside source 5] PPE shall be provided
3.	Diesel	DG Room & Process Room	Ambient Condition	Fire	1]Fire Extinguisher (Foam) 2] Sand Buckets

Major accidental Release measures & measures for storage & handling

- The chemical/fuel shall be stored in a separate safety storage room, shall be kept away from sources of ignition.
- Proper ventilation should be maintained.
- Proper medical facility arrangement shall be provided in case of any accidental release.
- In case of leak or spill, ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment. Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Do not contact with acids. Do not handle with bare hands.

Collection, development and dissemination of information

- Prior to working with these chemicals, workers should be trained on its proper handling & storage.
- Label Precautions and First Aid.

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- Emergency plan shall be prepared and mock drill of the on-site emergency should be conducted
- Inspection of the CBWTF shall be done at least once in year and annually status report on the compliance with the Rules shall be submitted.

- **Mechanical:**

Mechanical hazards are created by powered operation of equipments or tools. Mechanical hazards can occur at:

1. Process machinery
2. DG set room
3. Vehicular Movement

Following preventive measures shall be taken:

1. Periodic replacement of critical components of machine.
2. Proper training to operators of machines.
3. There will be safe distance demarcation on heavy machines like cranes (during construction)
4. Sign of danger at the hazard places.

TABLE 7.3: PROCESS & VESSEL HAZARDS AND CONTROLS

S. No.	Name of Plant	Hazardous Process and Operation	Materials in the process/ operation with their quantity	Name of the vessel and its location	Operating Parameters	Type of Hazard Possible	Control Measures Provided
1.	Incineration Plant	Incineration	Yellow category waste	Primary Chamber and secondary chamber, Incineration area	Temp 850°C – primary chamber and 1200°C – secondary chamber		1] Fully Automatic 2]Emergency Local Stop 3] Fire Extinguisher (CO2) 4] PPE 5]Emergency Provision for Fire Brigade from outside source.
2.	Auto-clave	Sterilization	Red category waste	Autoclave	Temp. around 135°C & 2.2Kg/sq.cm pressure	Fire, Health Hazard	1] Fully automatic Computer based automation 2]Emergency Local Stop 3] PPE

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- **Electrical:**

The electrical current can pass to the floor & metals due to inadequate insulation or accidently.

Electric spark can generate due to short circuiting in the electrical room

- **Thermal:**

Thermal hazards are objects or substances that transfer energy as heat. Incinerator is a thermal hazard for Bio Medical Waste processing.

The thermal hazard can cause burn of skin; following preventive measures can be taken:

- 1) Operators in the thermal hazard area shall be provided with protective gears like gloves, goggles etc.
- 2) For emergency first aid room will be maintained.

7.2.6 EMERGENCY RESPONSE PROCEDURE

Even after all the preventive measures for any emergency, following infrastructure shall be provided:

1. There will be an Emergency Control Room.
2. Assembly area shall be demarked for Industry.
3. Communication system shall be installed which includes intercom and public address system.
4. Fire alarm shall be installed at vulnerable place.
5. The safe zones (at the time of emergency) shall be displayed at different locations.
6. First Aid facility shall be made available at Control room.

In case of emergency following action shall be taken:

1. The emergency shall be declared in case of following:
 - I. Fire alarm buzzing (Fire hazard)
 - II. Vibration/Earthquake feeling (Earthquake)
 - III. Water logging above 30 cm from ground level (Flood)
 - IV. Any unusual smell of gas or suffocating feeling (Chemical leakage)
 - V. Security alarm from main gate. (Security risk/Terrorism)
2. On declaration of emergency, communication shall be made to residents
3. All the workers of the affected area shall be moved to safe zone
4. Control measures shall be taken as per the emergency action plan for each type of hazard.
5. All the members of disaster management cell shall take charge of their respective duties.
6. Outside help like fire tender, police, ambulance etc. shall be called by site controller or Incident controller.

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Recovery Procedure

The recovery procedure will depend on the type of emergency. Recovery procedure shall be followed by engineering section to restore the essential services. The PLI (Public Liability Insurance) shall be done as a part of off/on site emergency plan.

7.3.1 OFF-SITE MANAGEMENT PLAN

If an accident takes place in unit & its impacts are felt outside its premises, the situation is called an “Off-site Emergency”. To meet such Emergencies, an Off-site Emergency Plan is required to be prepared.

Cause of off-site emergency

In a Common Biomedical Waste Treatment Facility, the chemical & raw material storage room & handling area & transportation of the raw material may cause off- site emergency to occur.

Preventive Measures during Transportation

Transportation system with proposal of safety measures and appropriate waste handling system. There will be use of approx. 09 vehicles daily for transportation of bio-medical waste. These vehicles are for collection of bio medical waste from various medical establishments for 24 Hrs. The Vehicles shall be designed as per following CPCB norms:

- Separate cabins for driver/staff and the bio medical waste. There shall be provision of bulkhead between the driver’s cabin and the vehicle body, which shall be designed to retain the load if the vehicle is involved in a collision.
- The base of the waste cabin shall be leak proof and is easy to wash and disinfect.
- The inner surface of the waste cabin shall be made of smooth surface to minimize water retention.
- The vehicles shall be properly labeled with the symbol of Biohazard as per schedule III of the Rules and display the name, address and telephone number of the Company.
- The waste cabin shall have provision for sufficient opening from rear side so that Biomedical Waste can be easily loaded and unloaded.
- The vehicles shall be provided with the first aid kit to handle emergency situations.
- Empty plastic bags, suitable protective clothing, cleaning equipment, tools, and disinfectant, together with special kits for dealing with liquid spills, shall be carried in a separate compartment in the vehicle.
- Vehicles or containers used for the transportation of biomedical waste shall not be used for the transportation of any other material. They shall be kept locked at all times, except when loading and unloading.

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- Details of GPS system which shall be installed at all the transport vehicles

All the vehicles engaged in the collection and transportation of Bio Medical Waste from Health Care Establishments (HCE) shall be provided with Global Positioning System (GPS) to keep a track on the services rendered to the HCE. Reports will be generated on the routes covered by these vehicles for proper planning and management of collection and transportation of Bio Medical Waste. Flagging system shall be provided with the GPS system to view the online coverage of all the routes of the vehicles.

During Storage & Handling

- A written procedure to handle and report needle stick injuries and other waste-handling incidents. Injuries caused by needle sticks and sharp instruments will be documented, reviewed, and changes implemented to prevent similar incidents in the future;
- The threshold limit for the storage of the chemical at any point of time shall not exceed.
- To prevent and control risk and damage, all the raw material shall be stored in leak proof polybags at a secured and contained location with proper safety measures.
- Handling is shall be done as per NIOSH guidelines
- There shall be no drainage lines or water bodies near the raw material storage & chemical or fuel storage room to avoid contamination of water up to long distances.

Emergency Response Procedure

Under the 'Manufacture, Storage and Import of Hazardous Chemicals Rules 'preparation of 'Off-site Emergency Plan' is covered in Rule No.14. The duty of preparing and keeping up to date the 'Off-site Emergency Plan' as per this rule is placed on the District Emergency Authority. Already so, occupiers are charged with the responsibility of providing the above authority with such information, relating to the industrial activity under their control, as they may require for preparing the off-site emergency plan.

As per the rules, the main component of the Off-Site Emergency Plan is coordination with the District Authority. The District Authority (i.e. District Collector, Factory Inspector etc.) in conjunction with the company & nearby industries under mutual aid scheme and relevant emergency services should have an off-site emergency plan considering the following:

- Incidents at the site including fires and/or explosions would likely cause concern among local population. Although, the unit does not fall in residential area & does not have any residential premises in the vicinity, the people will be advised to stay away from the area, and relevant actions shall be followed.

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- In addition to company's own Emergency control center, the "local" external agencies will also be involved in the formulation of procedures for off-site incidents and in response to any incident;

Other external agencies that will also be involved in response to any incident are:

- Traffic Police;
- Fire services available with nearby industries;
- Civil Authority;
- Factory Inspector;
- State Pollution Control Board; etc.

The following aspects shall be addressed in any detailed response to an off-site incident:

- Organization: details of command structure, coordination arrangement, implementation procedures, emergency control centers. The organizational chart to deal with the emergencies (onsite & off site) is given ahead.
- Communication: identification of personnel involved, communication center, lists of telephone numbers (as given above) etc.
- Specialist Emergency Equipment; details of availability & location of heavy lifting gear bulldozers, specialized fire-fighting equipments;
- Specialist Technical Knowledge; details of organization or individuals whom it may be necessary to call e.g. for specialized chemical knowledge, impact knowledge etc.;
- Mutual Aid Scheme: details of companies in this scheme and available facilities with them & their phone nos.;
- Meteorological Information Sources; arrangements for obtaining details of weather conditions prevailing and weather forecast on regular basis;
- Humanitarian Arrangements; details of provisions for transport, evacuation routes and centers, food, treatment of injured etc.;
- Public Information; arrangements for dealing with the media, informing relatives of employees and local population;
- Incident Assessment; arrangements for collecting information on incident causes and reviewing the efficiency and effectiveness of all aspects of the emergency plan;

Efficient off-site incident planning also involves interaction on regular basis among various organizations. To ensure that every procedure put in place will run efficiently and effectively,

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exercise (mock drills) involving all the relevant organizations will be carried out. These will be monitored and assessed with procedures updated to reflect knowledge gained;

Roles & Responsibilities of External Agencies

The roles of the various parties that may be involved in the implementation of an off-site plan are described below:

A) Role of the Police

- Protecting life and property and controlling traffic movements.
- Controlling bystanders, evacuating the public, identifying the dead and dealing with casualties and informing relatives of dead or injured.

B) Role of the Fire Authorities

- The control of a fire is normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site.
- Fire authorities having major hazard works in their area should have familiarized themselves with the location on site of all stores of flammable materials, water and foam supply points and firefighting equipment.

C) Role of the Health Authorities

- Health authorities, including doctors, surgeons, hospitals, ambulances and so on, have a vital part to play following a major accident and they should form an integral part of any emergency plan.

D) Roles of the Government Safety Authority

- In the event of an accident, local arrangements regarding the role of the factory inspector will apply.
- In the aftermath, factory inspectors may wish to ensure that the affected areas are rehabilitated safely.

Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 prescribes for the constitution of the State Crisis Group as apex body at the State Level to deal with major chemical accidents and to provide expert guidance for handling major chemical accidents and for the constitution of District and Local Crisis Groups.

A. Functions of the State Crisis Group

- Review all district off-site emergency plans in the State with a view to examine its adequacy in accordance with the Manufacture, Storage and Import of Hazardous Chemical, Rules and forward a report to the Central Crisis Group once in three months;

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- ii. Assist the State Government in the planning, preparedness and mitigation of major chemical accidents at a site in the State;
- iii. Continuously monitor the post-accident situation arising out of a major chemical accident in the State and forward a report to the Central Crisis Group;
- iv. Review the progress report submitted by the District Crisis Groups;

B. Functions of the District Crisis Group

- i. Assist the preparation of the district off-site emergency plan;
- ii. Review all the on-site emergency plans prepared by the occupier of Major Accident Hazard's installation for the preparation of the district off-site emergency plan;
- iii. Assist the district administration in the management of chemical accidents at a site lying within the district.
- iv. Ensure continuous information flow from the district to the Centre and State Crisis Group regarding accident situation and mitigation efforts;
- v. Forward a report of the chemical accident to the State Crisis Group; and Conduct mockdrill of a chemical accident at a site each year.

C. Functions of the Local Crisis Group

- i. Prepare local emergency plan for the industrial pocket;
- ii. Ensure dovetailing of the local emergency plan with the district off-site emergency plan;
- iii. Train personnel involved in chemical accident management;
- iv. Conduct at least one full scale mock-drill of a chemical accident at a site every six months and forward a report to the District Crisis Group; and
- v. Respond to all public inquiries on the subject

Recovery Procedure

The recovery procedure will depend on the type of emergency. Recovery procedure shall be followed by engineering section to restore the essential services. The PLI (Public Liability Insurance) shall be done as a part of off/on site emergency plan.

Emergency Control Team

KEY PERSONNEL

The key Personnel involved in Emergency (Onsite & Offsite) are given below:

1. Emergency Controller – Plant Head
2. Incident Controller
3. Security Supervisor
4. HOD – Utility & EHS

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5. Safety Officer

6. Fire fighter

7. Evacuation members [Emergency Response Team (ERT) Members]

8. First Aid provider

9. Rescue members

7.3.2 OCCUPATIONAL HEALTH & SAFETY

Workers handling and disposing biomedical waste are at potential risk of exposure to infection from sharps related accidents or when containers of waste burst, open and leak, or spills of certain waste materials occur. Exposure to a needle or other sharp object contaminated with the blood of an infectious person presents the greatest potential risk for transmission of HBV, HIV, and other blood borne pathogens to the health-care worker and waste handler.

Action plan for the implementation of OHS standards as per OSHAS shall be followed as given below:

- Occupational health surveillance programme shall be done six monthly & and their records are being maintained.
- Company will take reasonable steps to reduce the risk of exposure to infection by establishing written policies and procedures based upon the most currently accepted clinical and occupational health and safety information in consultation with workers, handling and disposing of biomedical waste. These policies and procedures will be reviewed and updated regularly, with compliance to their requirements verified as necessary.
- Regular assessment of waste management procedures shall be done to assure compliance with applicable standards
- A written procedure to handle and report needle stick injuries and other waste-handling incidents shall be there. Injuries caused by needle sticks and sharp instruments will be documented, reviewed, and changes implemented to prevent similar incidents in the future;
- Emphasize the need for point of generation segregation so that waste shall be placed within an appropriate waste container.
- Type and quality of waste containers will be review regularly, if necessary it will be upgraded to more suitable container;
- Handling practices will be reviewed regularly to determine problems of inappropriate handling. If so, modify the handling techniques. At project site in case of emergency First Aid facility shall be provided.

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- Health check-up camps shall be organized on regular basis at company dispensary / nearby locations.
- Prior to working with bio-medical, workers shall be trained on its proper handling & storage.
- To educated/ train the workers for MSDS & handling of these chemicals.
- Proper medical facility arrangements shall be provided in case of any accidental release.
- ESI facility shall be made available.
- Proper fire-fighting measures like buckets & portable fire extinguishers shall be provided at strategic locations.
- Emergency plan shall be prepared and mock drill of the on-site emergency shall be conducted.
- Employers and employees shall be made aware of the hazardous properties of materials in their workplaces, and the degree of hazard each poses. Inspection of the treatment facility shall be done at least once in year and annually status report on the compliance with the Rules is being submitted.
- It shall be made sure that waste haulers and handlers will always be proper clothed and wear personal protective equipment so that harmful agents, whether physical, chemical, or infectious, are prevented from gaining access to open wounds, cuts, or by absorption through the skin. Personal protective equipment may include cut proof gloves, gowns, safety glasses, protective footwear, etc.
- A course of Hepatitis B (HBV) vaccine will be offered to all employees dealing with handling and disposing of biomedical waste who are at risk of exposure to human blood, blood products, or body secretions.
- A safety officer / environmental officer shall be recruited and lead all the safety issues related to man, machine & materials.
- Exterior refuge or safe areas shall be located away from the site of the emergency and which provides sufficient space to accommodate the employees.
- Public Liability Insurance Act, 1991 shall be followed.

7.3.3 PERSONAL PROTECTIVE EQUIPMENT

The level of risk of exposure to particular chemical will dictate the appropriate level of personal protective equipment (PPE) required, provide wearing side shielded safety spectacles and appropriate gloves, footwear, and face shields, respiratory protection, fire-resistant clothing, or chemical suits.

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- **Respirators:** A complete respiratory protection program has been instituted. It includes evaluations of workers' abilities to perform tasks while wearing CPC, Regular training of personnel, fit testing, Periodic environmental monitoring, Regular maintenance, inspection, and cleaning.
- **Clothing:** Workers wear appropriate protective clothing to prevent skin exposure.
- **Skin Protection:** Workers wear solvent resistant gloves and clothing.
- **Eye Protection:** Workers wear splash proof chemical goggles and face shield when working with liquid, unless full face piece respiratory protection is worn.
- **Eyewash facility and a safety shower:** Common work places are equipped with Eyewash facility and a safety shower.

7.3.4 WORKER HEALTH CHECKUP PLAN

Company shall conduct pre-employment and post-employment medical tests for its employees besides various educative and awareness programs on health and safety. A full time medical assistance center will be made available to its employees to carry out any first aids.

7.3.5 SAFETY, HEALTH AND ENVIRONMENT (SHE) MANAGEMENT PLAN AND TEAM

The company has a written policy for the safety, Health and Environment Management. Through this policy, the company management commits itself to the following objectives.

- Meet all the relevant laws, regulations and international agreements
- Conduct its activities safely, protecting the health of all employees and the products users
- Reduce the adverse environmental impacts to a practicable minimum at an acceptable cost to the company and society
- Encourage continuous improvement in safety, health and environment performance

7.3.6 SOCIAL IMPACT ASSESSMENT, R&R ACTION PLAN

No rehabilitation and resettlement is applicable for this project.

7.4 GEOLOGY & TOPOGRAPHY STUDIES

7.4.1 Geology

7.4.1.1 Topography

The topography of project site is flat and elevation is 177 meter. The buffer of 10km radius area minimum elevation is 168 meter in E direction and maximum elevation is 183 meter in W direction. The topography of district exhibits a flat topography with a few gentle undulations. Physiographical district occupies a part of Ganga Yamuna Doab, in which Ganga river traverses through the geophysical control of the district in the direction from north to south. The tributaries

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of Ganges viz., river Kali and river Bhuri Ganga provide most of the fertile patch to the district with the transference of the younger alluvium.

Geography/ Geomorphology

The area is part of the western fringe of Ganga alluvial plain and slopes gently towards east and along the drainage lines. The following geomorphological units have been delineated. Two main geomorphic units identified in the district are:

1. Younger Alluvium Plain
2. Older Alluvium Plain

1 Younger Alluvium Plain: Younger alluvium plain is mainly restricted to present river course and mainly represented by sand and loam. It is further divided into (a) Present flood plain and (b) Old flood Plain. The present flood plain has two main land forms i.e. present river course and sand plain sand bar. Similar the old flood plain is characterized by flowing land forms which are represented by loamy sand. The land forms are:

- i. Abandoned Channel
- ii. Meandering Scar
- iii. Black- swamp

2 Older Alluvium Plain: This unit is mainly characterized by yellow clay, kankar and Reh. It is represented by following land forms.

- i. Alluvium plain
- ii. Salt affected plain
- iii. Water logged plain

The maximum area of the district falls under these land forms.

Regional & Local Geology

The entire tract along the Ganga is a fertile land which has brought agricultural prosperity in Kasganj tehsil. The geology of the district belongs to Recent. The main sub-order associations of soils are Psamments – Fluvents-Aquents, Orthrepts–Psamments, Ochrepts- Orthents-Rock outcrops–and Ochrepts- Aquepts- Ustalfs. There are no forests in the district. On the basis of factors like geology, soils, topography, climate and natural vegetation, the district has been divided into following five sub-micro regions.

Ganga Khadar: The region extends parallel to the Ganga River in elongated shape in east- west side. It is a Khadar tract demarcated by high bluff from south. The Burhi Ganga is an offspring of

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the Ganga River, which originates from the Ganga and after flowing parallel in the region again joins the main stream just beyond the region. Actually it is not a separate stream but the old course of Ganga River which has shifted. This left course channel has been renamed as Burhi Ganga. There are numerous pockets of bhur and small water bodies. The Ganga is the main constraint for the development of roads and canals. The geology of the district belongs to Recent. The main sub-order soil associations are Psammments- Fluvents-Aquents, Ochrepts- Psammments, Ochrepts- Orthents Rock out crops and Ochrepts-Aquepts-Ustalfo, There are few local roads, which connect the places within the region. The highways and rail pass through the area and cross the Ganga at Kachhhia. The settlements in general are scattered. Ganj Dundwara, Soron and Sahawar are the important places in this area.

Middle Kali Plain: The region covers the catchments area of Kali Nadi which drains in the middle of the region. It is more wide in Kasganj and Patiyali tahsils and narrow towards Aliganj. The slope is towards eastern side. The upper course is known as Nim, Karon, is the other tributary of Kali. Besides there are number of small rivulets which join the Kali on both sides but they are dry in most part of the year. Small patches of bhur are spread over in the region. The geology of the region belongs to Alluvium, Dun Gravels (Recent). The main soil sub-order association is Ochrepts- Orthents-Rock outcrops. Since it is flat plain, transport and irrigation system are very developed. There are number of major roads which connect the important places of region. Cart tracts and foot-paths join the rural areas. Agriculture is the main occupation which is supported by the Lower Ganga canal system. The important places situated in this region are Kasganj, Bilram, Amanpur, Mohanpur, Sidhpura.

Stratigraphic sequence:-

Stratigraphically the quaternary alluvium is built up of alternate layers of sand and clay with occasional interbeds of kankar which were deposited on the eroded and upturned surface of bhandar limestone of the upper Vindhyan group of upper proterozoic age.

Quaternary- alluvium-alternate layers of sand and clay with occasional interbeds of kankar.

----- UNCONFORMITY -----

Upper Vindhyan- Greenish grey dolomitic limestone, reddish brown quartz arenite, grayish brown shale, reddish brown argillaceous limestone, quartz wacke & quartz arenite,

----- UNCONFORMITY -----

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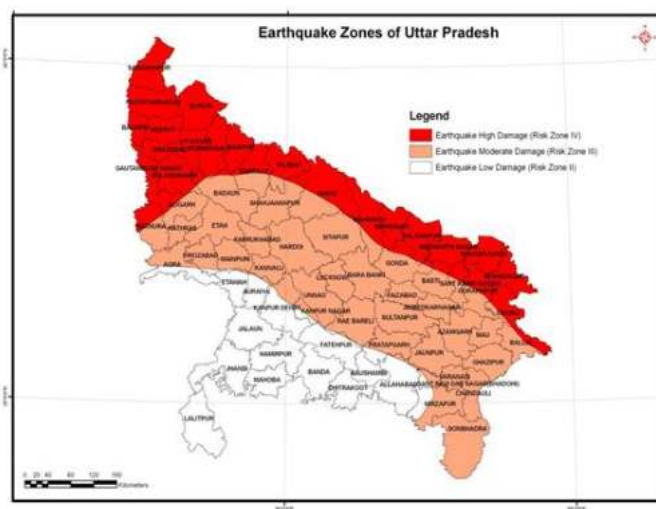
7.4.1.2 Sesimology

Kasganj falls in seismic zone IV which makes it high at risk in regards to earthquakes. However No major earthquake has occurred in Kasganj in recent years, also the site does not include any buildup area or bridges, so it makes the project site area less risky towards the earthquake, according to the Indian Standard Seismic Zoning Map. Suitable seismic coefficients in horizontal and vertical directions respectively will be adopted.

FIGURE NO. 7.1 SEISMIC ZONES OF INDIA



FIGURE NO. 7.2 SEISMIC ZONES OF UTTAR PRADESH



Earthquake History

Most of the state of Uttar Pradesh lies in the Gangetic Plain. This is a fore-deep, a downwarp of the Himalayan foreland, of variable depth, converted into flat plains by long-vigorous sedimentation. This is known as a geosyncline and the Gangetic Plain is the Indo-Gangetic Geosyncline. This has shown considerable amounts of flexure and dislocation at the northern end and is bounded on the north by the Himalayan Frontal Thrust. The floor of the Gangetic trough (if see without all the sediments) is not an even plain, but shows corrugated inequalities and buried ridges (shelf faults). Beneath Uttar Pradesh, run the Delhi-Haridwar Ridge (DHR), trending NNE-SSW along New Delhi to the Gharwal region. The Delhi-Muzaffarnagar Ridge (DMR), which trends east to west, running from New Delhi to Kathgodam, in Nepal. The last ridge is the Faizabad ridge (FR), which runs in a curved manner, first east to west from Allahabad to Kanpur and then starts to bend towards the north-east towards Lucknow and carries on in this direction towards the Himalayas in Nepal. The depression that forms between the DMR and the FR, forms the West Uttar Pradesh shelf in the west and the Sharda Depression in the east. The region to the south of

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the FR, forms the East Uttar Pradesh shelf. There are several faults in the region, among them the Moradabad Fault which trends NE-SW and the Bhairwan Fault in the vicinity of Allahabad. Apart from these there are east-west running tear faults in the region that control the courses of the main rivers. Earthquakes have occurred in mostly all parts of Uttar Pradesh. Major earthquakes in the neighbouring states of New Delhi, Uttaranchal, Bihar and from across the Indo-Nepal border have also shaken many parts of Uttar Pradesh. However, it must be stated that proximity to faults does not necessarily translate into a higher hazard as compared to areas located further away, as damage from earthquakes depends on numerous factors such as subsurface geology as well as adherence to the building codes.

IMPACT OF GEOLOGY

The new construction is always expected to have impacts on surround environment land use directly or indirectly based on quantum of area under construction. The possible impacts identified on topography and geology of the area will occur due to land grading, cutting, excavation of the earth work for making road, work shed related civil construction activities etc.

MITIGATION MEASURES

There is no heavy construction work envisaged. Hence, the following is the measures to minimize the impact on land environment.

- The installation activities include excavation of soil from the proposed site.
- The excavated loose soil will be utilized for leveling of low lying areas inside the plant. Thus, the impact on topography during construction phase is insignificant.
- There are no geological structures identified in the project area.
- The strata is competent to bear the construction proposed.

Hence there will be no significant impact from changing the land topography on account of geology.

7.5 Hydrogeology

Block Name	Soron (As per CGWA Classification)
Category of Block	Safe (Non-Notified)
Water Demand	5KLD

Rainfall

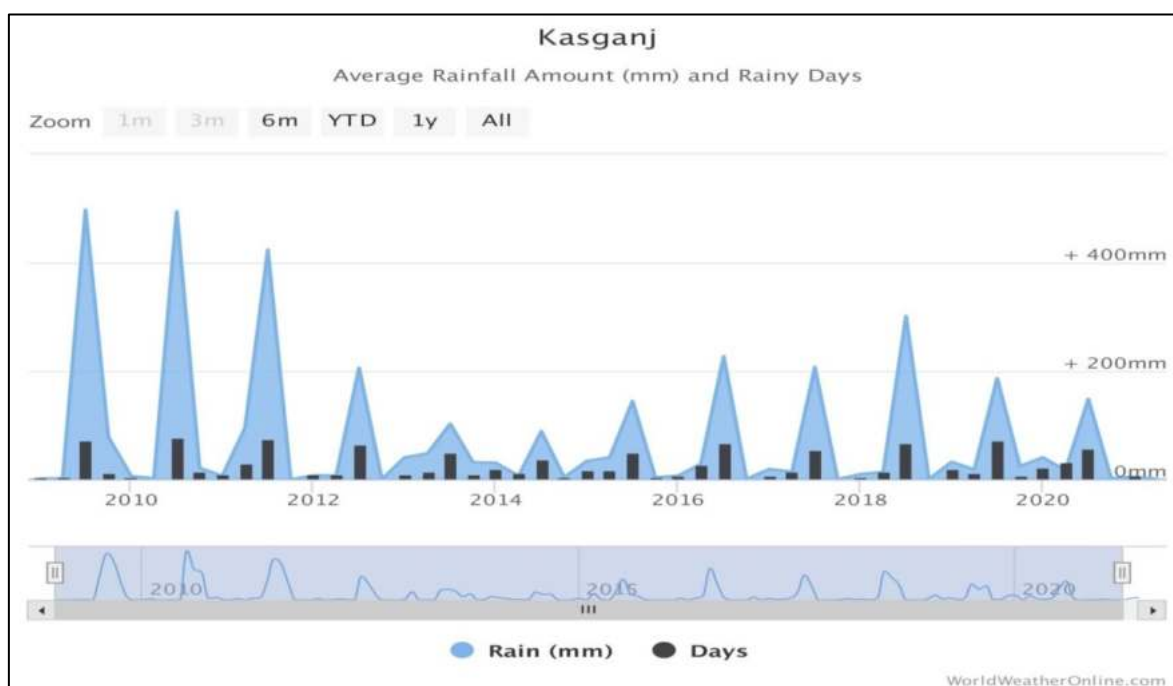
The average annual rainfall is 722.40 mm. The climate is sub-tropical humid and it is characterized by a hot dry summer and a pleasant to extreme cold season. About 88% of rainfall takes place from June to September. During the monsoon surplus water is available for deep percolation to

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ground water. The pre monsoon depth of water level is 3.11 to 10.24 mbgl and in post monsoon it reaches to 2.58 to 9.79 mbgl. **(Source-District Survey Report)**

TABLE NO. 7.4 AVERAGE RAINFALL DATA OF 10 YEAR (2011-2020)

Sr. No.	Year	Total Rainfall (MM)	Average Rainfall (MM)
1	2011	1578.37	131.53
2	2012	662.35	55.20
3	2013	669.16	55.76
4	2014	391.09	32.59
5	2015	670.13	55.84
6	2016	791.32	95.94
7	2017	724.00	60.33
8	2018	977.02	81.41
9	2019	786.20	65.52
10	2020	626.00	52.16
Total Average Rainfall (MM)			686.28/10 = 68.628 say 69
Source: www.worldweatheronline.com			



Surface water:

The chief rivers of the district are the Ganga the Burhi Ganga, the Kali Nadi, the Isan, the Rind, the Sengar and the Bagarh.

Ganga: The Ganga forms for about 74 km. the northern boundary of the district flowing in south – easterly direction. The river flows at a distance varying from 5-15 km from its old high bank

Burhi Ganga: The former bed of the Ganga is marked by Burhi Ganga which enters the district in the northwest corner and flows south-east wards at a considerable distance from the old high bank which is locally known as the pahar

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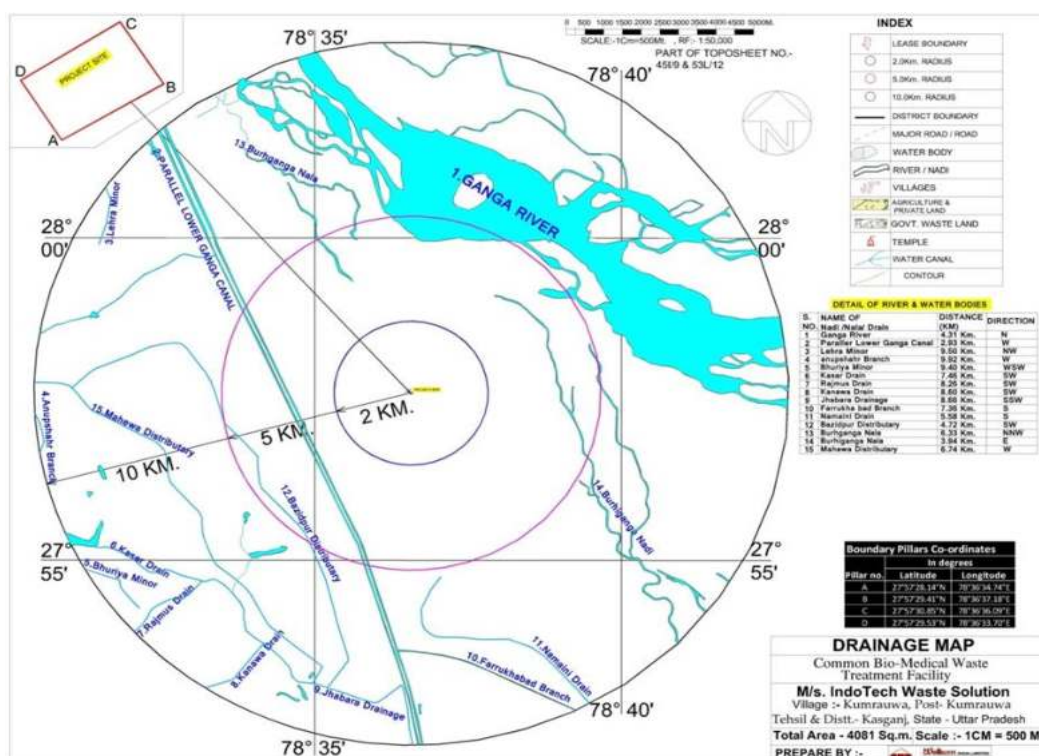
Kali Nadi: The Kalinadi or Kalinadi as it is often called locally flows to the south of the Burhi Ganga at a distance of 11 to 27 km. entering the Kasganj district from the Aligarh in the northwest its general trend is to the south-east. The valley through which the river flows is deep and about 5 km in width

Surface water in the study area :-

TABLE NO. 7.5 SURFACE WATER IN 10 KM. RADIUS

Sr. No.	River/ water body	Distance Km	Direction
1	Ganga River	4.31	N
2	Paraller Lower Ganga Canal	2.93	W
3	Lehra Minor	9.50	NW
4	Anupshar Branch	9.92	W
5	Bhuriya Minor	9.40	WSW
6	Kasar Drain	7.46	SW
7	Rajmus Drain	8.26	SW
8	Kanawa Drain	8.60	SW
9	Jhabara Drainage	8.66	SSW
10	Farrukha bad Branch	7.36	S
11	Namaini drain	5.58	S
12	Bazidpur Distributary	4.72	SW
13	Burhganga Nala	6.33	NNW
14	Burhiganga Nala	3.94	E
15	Mahewa Distributary	6.74	W

FIGURE NO. 7.3 DRAINAGE MAP OF 10 KM. RADIUS



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Ground water:

Occurrence of Ground Water: The ground water occurs in the pore spaces of unconsolidated alluvial sediments in the zone of sedimentation. The top silty/ sandy clay beds mixed with kankar support the dug-wells where ground water occurs under water table conditions. The ground water in the deeper aquifers occur in semi confined to confined conditions.

Ground Water Resources:

Precipitation is the main source of ground water recharge in the district. The quantity of recharge depends upon the intensity and duration of rainfall, nature and texture of soil, vegetation cover and land use pattern of the area.

The other sources which replenish the ground water are as under

1. Seepage from canal system
2. Return flow from applied irrigation
3. Sub surface in flow from adjoining area
4. Influent recharge from the river system

Status of Ground Water Development

Ground water development should take place in those blocks only where the stage of ground water development falls under safe category

TABLE NO. 7.6 BLOCKS FALLING UNDER SAFE CATEGORY, KASGANJ DISTRICT, UP

S. No.	Name of Block	Category of Block
1	Amanpur	Safe
2	Ganjdundwara	Safe
3	Patiyali	Safe
4	Sahawar	Safe
5	Sidhapura	Safe
6	Soron	Safe
7	Kasganj	Over Exploited

However, further development of ground water should be done judiciously in Kasganj block as to sustain the safe category and the ground water development should be completely restricted/ regulated in the Kasganj.

Water Conservation and Artificial Recharge

Artificial recharge structures (Rainwater Harvesting) may be developed in study area to recharge the aquifer for improving the ground water scenario in the block and also for improving the category of the block.

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Surface Water Quality:

Surface water quality had been assessed by 3 sample of surface water Ganga River Upstream, Ganga River Downstream and Parallel Lower Ganga Canal. The other samples were collected as grab sampling from different ponds/Nalla/water body within the impact zone. The details of sampling locations and analysis reports are given below:

TABLE NO. 7.7 DETAILS OF SURFACE WATER SAMPLING LOCATION AND ANALYSIS REPORTS

Sr. No.	Parameter	Unit	Ganga River Upstream (SW)	Ganga River Downstream (SW)	Parallel Lower Ganga Canal (SW)
1.	pH	-	7.11	7.18	7.29
2.	EC	µs/cm	213.3	223.1	239.7
3.	Color	Hazen	<5	<5	<5
4.	Odour		Agreeable	Agreeable	Agreeable
5.	Turbidity	NTU	0.5	0.5	0.7
6.	TDS	mg/l	122	128	156
7.	Hardness	mg/l	80	86	98
8.	Calcium	mg/l	17.6	18.4	24.8
9.	Magnesium	mg/l	9.6	9.6	8.6
10.	Alkalinity	mg/l	74	78	82
11.	Chloride	mg/l	11	12	14
12.	Fluoride	mg/l	0.2	0.2	0.2
13.	Sulphate	mg/l	7.8	9.3	14.8
14.	Nitrate	mg/l	1.2	1.4	2.1
15.	Sodium	mg/l	11.8	12.8	19.2
16.	Potassium	mg/l	2.4	2.7	2.6
17.	Phosphate as PO ₄	mg/l	(<0.1) BDL	(<0.1) BDL	0.10
18.	Zinc	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL
19.	Lead	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL
20.	Iron	mg/l	(<0.1) BDL	(<0.1) BDL	(<0.1) BDL
21.	Cadmium	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL
22.	Mercury	mg/l	(<0.001) BDL	(<0.001) BDL	(<0.001) BDL
23.	Boron	mg/l	(<0.1) BDL	(<0.1) BDL	(<0.1) BDL
24.	Copper	mg/l	(<0.1) BDL	(<0.1) BDL	(<0.1) BDL
25.	Arsenic	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL
26.	Chromium	mg/l	(<0.02) BDL	(<0.02) BDL	(<0.02) BDL
27.	Cyanide	mg/l	(<0.01) BDL	(<0.01) BDL	(<0.01) BDL
28.	DO	mg/l	7.8	7.3	7.0
29.	BOD	mg/l	1.9	2.2	2.5
30.	COD	mg/l	(<5) BDL	8.3	8.3

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FIGURE NO. 7.4 GANGA RIVER SURFACE WATER SAMPLE



Ground water Quality:

The quality of ground water is good in shallow aquifers except in Soron block where EC, Th., are more than permissible limits. The quality of deeper aquifer is not suitable for drinking purposes at places. It is observed that the ground water is suitable for drinking and domestic uses.

Ground water quality had been assessed by selecting 8 sampling stations in impact zone. The details of sampling locations and analysis reports are given below:

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TABLE NO. 7.8 DETAILS OF GROUND WATER SAMPLING LOCATION AND ANALYSIS REPORTS

Sr. No.	Parameter	Unit	Project site(GW)	Nagla Jaisiya (GW)	Takharu (GW)	Gohati (GW)	Kaindi (GW)	Pachlana (GW)	Kamraua (GW)	Sirawali (GW)
1.	pH	-	7.15	7.10	7.28	7.08	7.22	7.03	7.17	6.96
2.	EC	µs/cm	803.2	739.4	343.2	1079	337.9	414.6	486.4	560.4
3.	Color	Hazen	-	-	-	-	-	-	-	-
4.	Odour		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Turbidity	NTU	0.4	0.3	0.5	0.4	0.4	0.5	0.6	0.4
6.	TDS	mg/l	510	456	216	706	208	272	322	370
7.	Hardness	mg/l	316	290	160	388	144	196	232	284
8.	Calcium	mg/l	78.4	88.8	48	110.4	45.6	56	59.2	70.4
9.	Magnesium	mg/l	28.8	16.3	9.6	26.9	7.2	13.4	20.2	25.9
10.	Alkalinity	mg/l	280	360	218	300	198	192	202	276
11.	Chloride	mg/l	38	34	16	74	18	16	38	20
12.	Fluoride	mg/l	0.4	0.5	0.3	0.5	0.3	0.3	0.4	0.4
13.	Sulphate	mg/l	27.4	54.7	11.2	73.2	11.9	14.1	11.2	13.8
14.	Nitrate	mg/l	3.3	5.5	2.4	3.8	3.8	1.7	2.9	1.7
15.	Sodium	mg/l	74.2	83.4	17.9	108.4	24.8	41.6	36.1	40.6
16.	Potassium	mg/l	5.1	7.6	4.2	6.4	4.4	4.8	5.1	4.9
17.	Phosphate as PO ₄	mg/l	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)
18.	Zinc	mg/l	0.11	(<0.01)	(<0.01)	0.10	(<0.01)	(<0.01)	(<0.01)	0.11
19.	Lead	mg/l	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
20.	Iron	mg/l	0.10	0.18	(<0.1)	0.12	0.14	(<0.1)	0.11	(<0.1)
21.	Cadmium	mg/l	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
22.	Mercury	mg/l	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)
23.	Boron	mg/l	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)
24.	Copper	mg/l	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)	(<0.1)
25.	Arsenic	mg/l	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
26.	Chromium	mg/l	(<0.02)	(<0.02)	(<0.02)	(<0.02)	(<0.02)	(<0.02)	(<0.02)	(<0.02)
27.	Cyanide	mg/l	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)

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FIGURE NO. 7.5 GROUND WATER SAMPLE**Water Requirement for Project:**

During Construction phase water requirement will be approx. 2 KLD

(Source- Water Tankers)

During Operational Phase water requirement will be approx. 5KLD.

(Source- Bore Well & External Water Tankers)

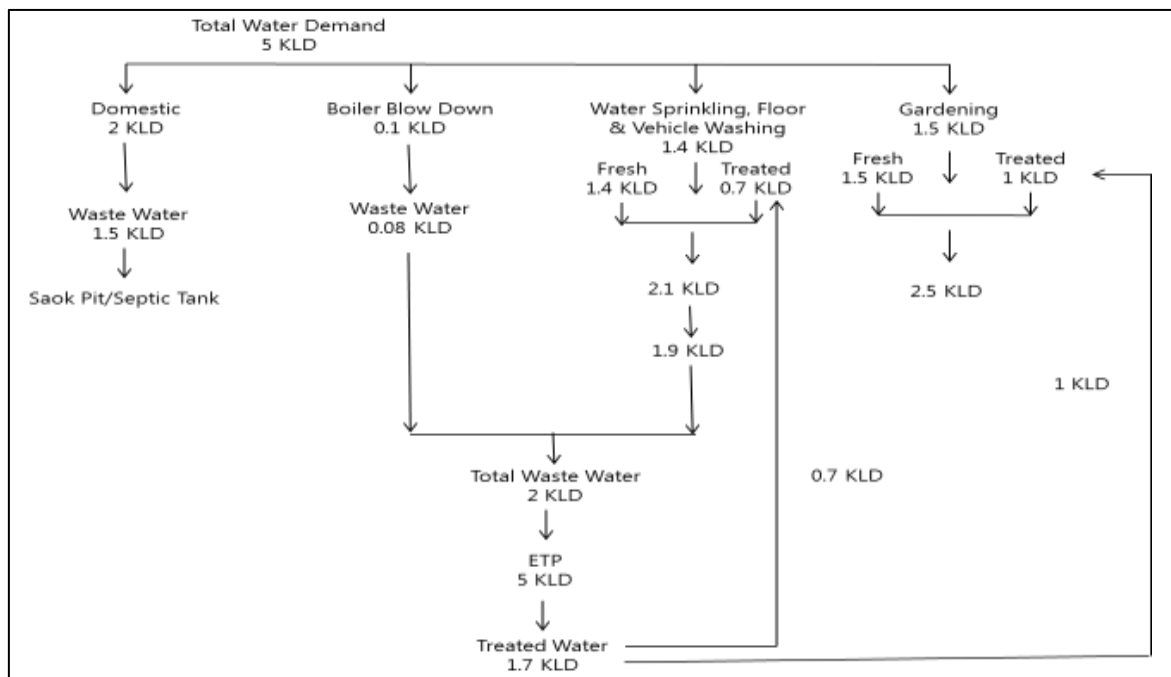
The amount of total waste water generated out of proposed CBWTF is 2 KLD which shall be treated in 5 KLD ETP. It will be a Zero Liquid Discharge Unit.

Details of water consumption for the proposed activity are given in Table below:

TABLE NO. 7.9 WATER BALANCE FOR OPERATION PHASE

S. No.	Activity	Total Water	Treated Water (Requirement)	Discharge to ETP
1.	Floor & Vehicle Washing, Water Sprinkling	1.4KLD	0.7 KLD	1.9 KLD
3.	Boiler Blow down	0.1 KLD	-	0.08 KLD
4.	Domestic use	2 KLD	-	Sent to Soak Pit/Septic Tank
5.	Gardening	1.5 KLD	1 KLD	-
Total		5 KLD	1.7 KLD	2 KLD

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FIGURE NO. 7.6 WATER BALANCE DIAGRAM**Tank Capacity:**

The size of the tank must be suitable for the number of people that intend to use it, so

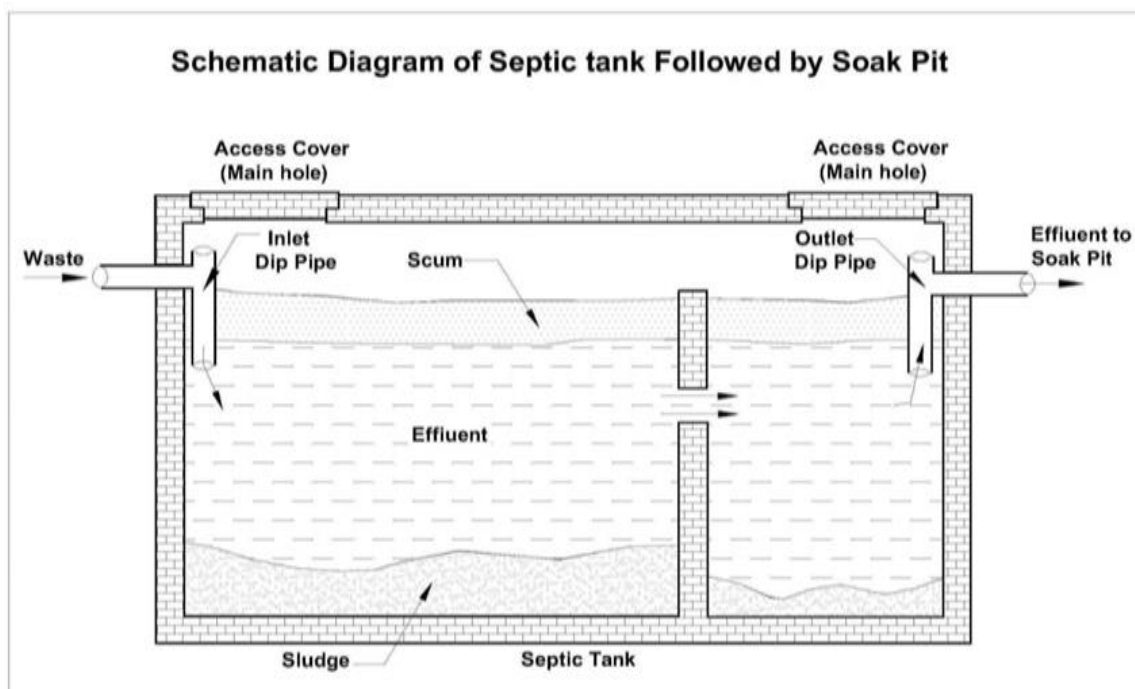
$$C = 42P + 2000$$

$$C = (42 \times 30) + 2000$$

$$= 3260 \text{ liters (for 1 year)}$$

C = Capacity of the tank in liters

P = The Population served

a) Construction of Tanks, Soak Pits etc. with diagram.**FIGURE NO. 7.7 SOAK PIT**

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Impact & Mitigation measures of Hydro-geology

Impact: Following are the impacts identified on HG due to proposed project as Kashganj district is flat and elevation is 177 meter, as below:

- Proposed project is for Bio-medical waste plant and belongs to polluting industry (Red Category) and as per CGWA Public Notice, only rooftop rainwater harvesting is envisaged.
- Hence, in order to prevent pollution of ground water due to recharge, it has been decided that such industries which are likely to contaminate groundwater, shall conserve roof top rain water only by constructing storage tank on the surface and shall not recharge within the premises.
- Sort term negative impacts due to water consumption & sewage disposal are envisaged due to the proposed project.
- The wastewater generation will be from the domestic and industrial activities. It will be properly treated.

Mitigation Measures: Following mitigation measures are suggested to be adopted in construction and operational phase, given as below:

- Water requirement for construction phase will be very limited and for short period only. Thus, there will not be any significant impact on water environment.
- Domestic effluent will be disposed of through septic tank into soak pit.
- Greenbelt development will have positive impact on ground water table and treated water will be preferably used for greenbelt development.
- Measures will be implemented to prevent seepage of liquid materials into ground where it could contaminate groundwater and soil.
- Ensure prompt cleaning up of accidental spillages measures will be followed to prevent the contamination of hydrological features by diesel, grease, oil, etc. derived from the working area.
- Provisions will be made to ensure the construction vehicles stick to the access track to prevent mud & dirt being deposited on roads.
- Fence will be constructed around the site to trap sediments from runoff water.
- Separate drainage will be proposed for storm water and for sewage to avoid run off contamination as well as any contamination of surface water sources.
- Rainwater harvesting will be proposed and recharge the ground water as well as rain water will be reuse in project premises so overall water demand will be reduced as per CGWA.
- Drip irrigation system will be provided for landscaping to reduce fresh water demand.

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Rooftop Rainwater Harvesting Structures

The storm water disposal system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. The amount of storm water run-off depends upon many factors such as intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. The drains shall be located near the carriage way along either side of the roads. Taking the advantage of road camber, the rainfall run off from roads shall flow towards the drains. Storm water from various areas/shall be connected to adjacent drain by a pipe through catch basins. Therefore, it has been calculated to provide 3 rainwater storage tanks for rooftop water collection only at selected locations:

- 1) Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to roads. The building roof water will be brought down through these pipes.
- 2) Proposed storm water system consists of pipe drain, catch basins and seepage pits at regular intervals for rain water recharging and ground water recharging.
- 3) Peak Hourly rainfall of 90 mm/hr has been considered for designing the storm water drainage system. Rain water recharging has been catered to and designed as per the guidelines of CGWA.

The bottom of the recharge structure will be kept 5 m above the ground water level. At the bottom of the recharge well, a filter media is provided to avoid choking of the recharge bore.

Design specifications of the rain water recharging plan are as follows:

- Catchments/roofs would be accessible for regular cleaning.
- The roof will have smooth, hard and dense surface which is less likely to be damaged allowing release of material into the water. Roof painting shall be avoided since most paints contain toxic substances and may peel off.
- All gutter ends will be fitted with a wire mesh screen and a first flush device would be installed. Most of the debris carried by the water from the rooftop like leaves, plastic bags and paper pieces will get arrested by the mesh at the terrace outlet and to prevent contamination by ensuring that the runoff from the first 10-20 minutes of rainfall is flushed off.
- No sewage or wastewater would be admitted into the system.
- No wastewater from areas likely to have oil, grease, or other pollutants has been connected to the system.

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Based on the site plan of the project area, the computation of annual runoff of entire project premises has been worked out and the details are tabulated below in Table (7.7) & (7.8).

TABLE NO. 7.10 ANNUAL RUNOFF FROM ENTIRE PROJECT

S. No.	Particulars	Area (Sqm)	Rain fall (m)	Runoff Coefficient*	Quantum of Run off available (Cum/Year)
	1	2	3	4	5 (2*3*4)
1	*Roof Top of building/Shed/	1165	0.069	0.85	68.32725
2	Road/Paved area	1080	0.069	0.65	
3	Open Land	1347	0.069	0.20	
4	Green Belt	489	0.069	0.15	
5	Total (sqm)	4081		Total Quantum of available runoff (cum/y)	68.32725
* Ref: Manual of Artificial Recharge of Ground Water, (CGWB,2007)					
*Note: As per CGWA guidelines, in the bio-medical waste projects, only roof top rainwater harvesting is considered for calculation.					

From the above computation, it is evident that a total quantum nearly of 68.3272 m³ of rainwater can be generated annually. In order to design the recharge structure, hourly runoff of 90 mm/hr has been taken into account and the details are given below in Table (7.8)

TABLE NO. 7.11 RAIN WATER QUANTITY CALCULATIONS

S. No.	Particulars	Area (Sqm)	Rain fall (m)	Runoff Coefficient*	Quantum of Run off available (Cum/Year)
	1	2	3	4	5 (2*3*4)
1	*Roof Top of building/Shed/	1165	0.069	0.85	68.32725
2	Road/Paved area	1080	0.069	0.65	
3	Open Land	1347	0.069	0.20	
4	Green Belt	489	0.069	0.15	
5	Total (sqm)	4081		Total Quantum of available runoff (cum/y)	68.32725
* Ref: Manual of Artificial Recharge of Ground Water, (CGWB,2007)					
*Note: As per CGWA guidelines, in the bio-medical waste projects, only roof top rainwater harvesting is considered for calculation.					

It has been worked out that total runoff generated within project premises per hour with 90 mm/hr intensity of rainfall shall be **68.3272 m³/hr.**

The calculations are as under:

Taking 20 minutes retention time, total volume of storm water = 68.3272/3= 22.7757 m³

Taking effective width & depth of a storage tank as 3.0 m & 3.5 m respectively;

Volume of Storage tank = 3.0× 3.0 × 2.5 = 22.5 m³

Total volume of single Storage tank = 22.5 m³

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No. of Storage tank required = $68.3272/22.7757 = 3$

As 1 tank per acre is to be proposed approximate; thus, total 3 no. of Rain Water storage tank have been proposed within the project premises.

Layout showing rain water recharging pits

The rain water collected on the entire whole building roof will be recharge ground water by rooftop Rainwater harvesting structure.

Rainwater harvesting can serve as a solution to the water problem in the water crises area by capturing the runoff. Rainwater harvesting helps in utilizing the primary source of water to prevent the runoff from going into sewer or storm drains, thereby serving dual purpose making water available for future use and reducing the load on treatment plants as well as other service lines.

Rainwater harvesting comprises of two components:

- Storing rainwater in groundwater reservoirs for beneficial use in future.
- Rain water harvesting for artificial recharge of ground water.
- Amount of water that can be effectively harvested is called the harvesting potential of the site. Efficiency of rainwater harvesting and recharging groundwater can be increased by following methods:
 1. Use vegetated swales and depressions to reduce runoff.
 2. Reduce and filter surface runoff.
 3. Catchment drainage all along the periphery of plot to prevent surface runoff.

Rain water harvesting structures will be provided to recharge the groundwater resources in the region. The run-off water from the roof structure and paved areas will be collected through storm water drainage system and led to rain water harvesting structure.

Storm Water Management:

Rainwater runoff comprises of storm water, which flows into both surface water and groundwater. Proper management of this resource ensures that storm water discharge is free of contamination. A detailed “Storm Water Management Plan” will be developed. The plan consists of best management practices, which include consideration of the following:

- Good housekeeping in the above areas.
- Conducting routine inspections to ensure cleanliness
- Secondary containment and dykes in fuel/oil storage facilities

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- Preparation of spill response plans, particularly for fuel and oil storage areas.
- Provision of silt traps in storm water drains.
- Regular inspection and cleaning of storm drains.

Design of Rain Water Harvesting Structure:

The dimensional parameters of De-silting/Settlement chamber would be 3 m (length) x 3 m (width) x 2.5 (depth). Each structure will be capable of handling rainwater volume @ 22.5 m³/day

FIGURE NO. 7.8 ROOFTOP RAINWATER HARVESTING STRUCTURE (MODEL)

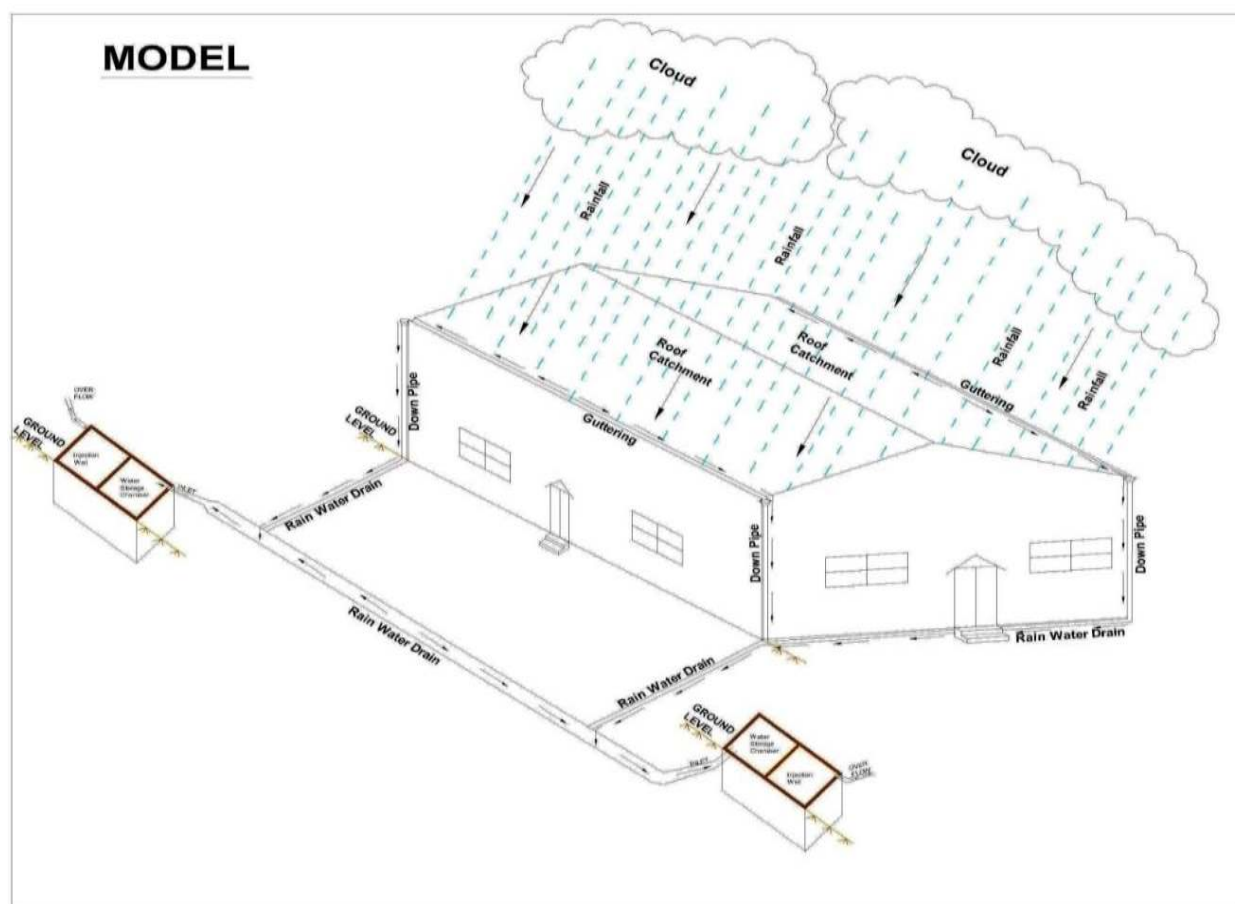
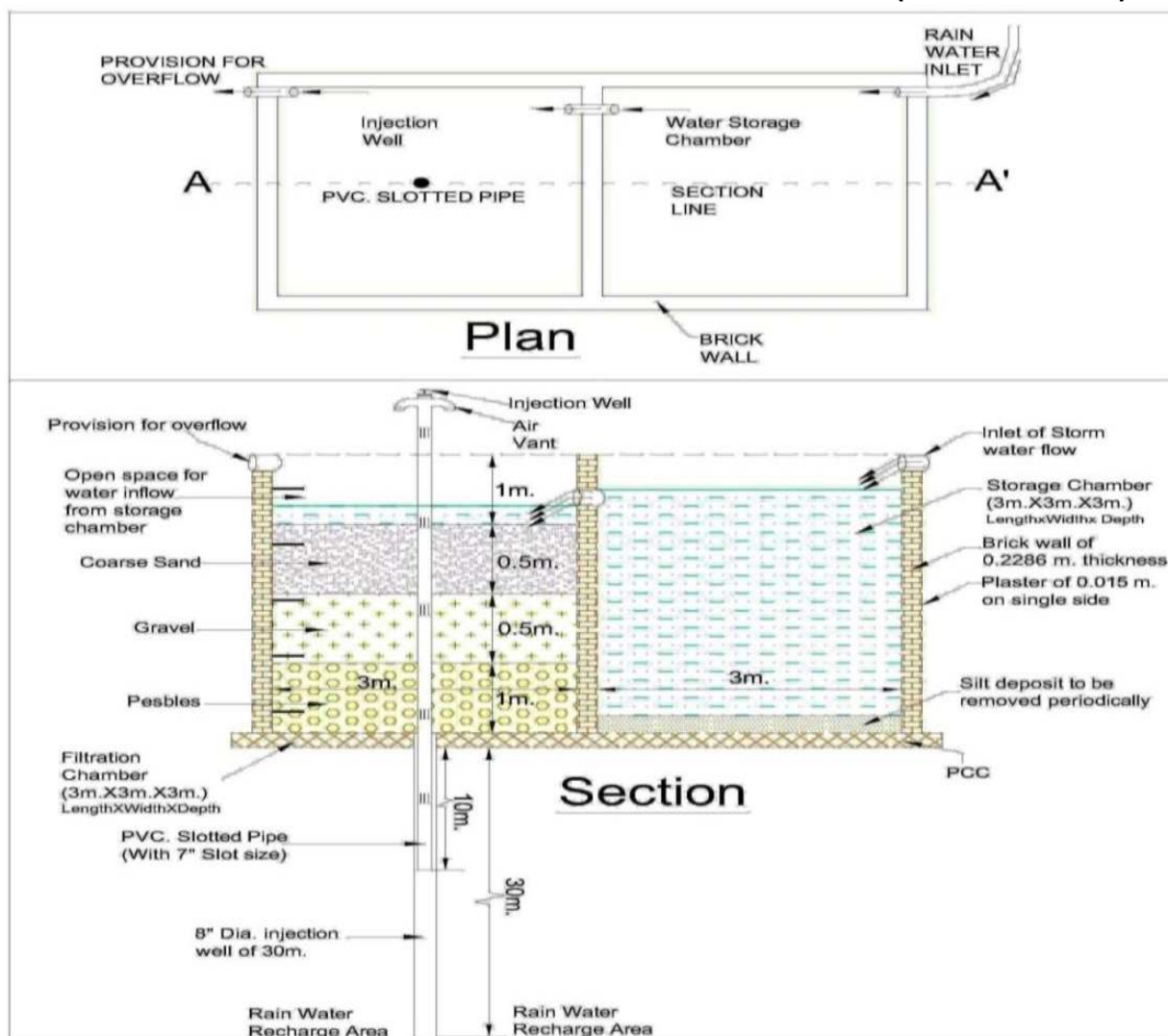


FIGURE NO. 7.9 ROOFTOP RAINWATER HARVESTING STRUCTURE (PLAN & SECTION)



Precautions: While carrying out roof top rainwater harvesting & surface runoff utilization works following precautions must be taken so that maximum benefits are derived. The roof tops of the buildings to be used for collecting rainwater must be cleaned before the onset of first rainfall so that any dust, leaves, pollutants do not enter the filtration tank. Grating must be used to trap debris or tree leaves before rainwater enters the drainpipes. A steel wire mesh maybe enveloped around the slotted pipe of injection well to minimize the clogging of slots. The filter material must be washed with water before putting in the filtration tank as these may be covered with silt or clay. Every year, before the onset of first monsoon, the filter material must be taken out and washed and then put back in the filtration tank & other recharge structures so that silt/clay deposited during the filtration process of preceding year is removed and original filtration rate is achieved.

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7.6 Public Consultation

Public Hearing

(a) Date of Advertisement

05.05.2022

(b) Newspapers in which the advertisement appeared

Jansatta & Times of India

(c) Date of public hearing (DD/MM/YYYY)

06.05.2022

(d) Public Hearing Panel chaired by & members present

S. No.	Name	Designation
1	Smt. Harshita Mathur	District Magistrate, Kasganj
2	Dr. J.P. Singh	Regional Officer, Uttar Pradesh Pollution Control Board, Aligarh
3	Shri, Upendra Prasad	Junior Engineer, Uttar Pradesh Pollution Control Board, Aligarh

(e) No. of people attended the public hearing meeting and number of people from the lease area.

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Public hearing proceedings started at 12:30 PM after due permission of the Chairperson. Convener Dr. J.P. Singh during her introductory speech explained procedure of public hearing and cleared that, public hearing committee doesn't have right to recommend or to approve project.

The proceeding of public hearing along with received written objections /memorandums and video recording will be submitted to the ministry for further needful action. He then invited industry representative to give power point presentation of proposed expansion project.

M/s Wolkem India Limited for said proposed project has given power point presentation in Hindi regarding details of proposed project, present Environmental status, impact of proposed project & environmental mitigation measures.

Dr. J.P. Singh, convener of the public hearing invited present people to put their views, objections etc. regarding project.

Thereafter, in the public hearing following persons expressed their views which were answered by Project Proponent. Details of issues discussed are as follows:-

S. No.	Name of Person	Suggestion/Comments	Statement and Commitment of Industry Representative
1	Shri, Sudhir,	▪ Sudhir asked that if this plant	• It was apprised that on the

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S. No.	Name of Person	Suggestion/Comments	Statement and Commitment of Industry Representative
	Village- Pachlana	is established near our village, then what will be the benefit to our villagers.	establishment of the said plant, the local residents of the village would be given direct or indirect employment as per the qualification in the unit..
2	Gram Pradhan, Village- Pachlana	With the installation of such a plant, pollution will spread around, what measures will be taken to prevent it.	- For pollution control by the unit, about 30 meters high chimney will be installed with air pollution control system as per the instructions given by CPCB/SPCB. - Intensive plantation will be done around the plant. - The vehicles used in loading-unloading of bio-medical will be washed daily and all the pollution control units set up in the unit will be operated continuously.
3	Smt. Harshita Mathur, District Magistrate, Kasganj	What will happen on behalf of the unit in the CSR item.	- It was apprised that about Rs 46.4 lakh has been proposed by the unit under CSR head along with EMP budget, which will be spent for the development of about 3 surrounding villages, in which primary and junior high schools will have paint, fan and drinking water for children, pucca roads in the villages, provision of drinking water, etc. - Addition to above the project proponent has proposed to invest

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S. No.	Name of Person	Suggestion/Comments	Statement and Commitment of Industry Representative
			amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project.
4	Shri, Vishal Sathe, City-Mathura	- At present my unit is established and operated in Mathura district and at present work is being done by me on about 7306 beds. According to the rules, a plant should have a capacity of 10000 beds. Do they have that capacity, if not then why did the pollution control board give permission. - Work is being done by my unit in Kasganj district for about 12 years. Gap analysis has not been done by them regarding the beds, which needs to be assessed, from where they will bring so many beds. - Similarly, if they give affidavits for Aligarh and Kasganj	- It was said by the Regional officer UPPCB that at present no permission has been given to the unit, after this public hearing, its compliance report will be sent to the SEIAA committee. The SEIAA committee will decide whether the unit is currently approved or rejected. - The gap analysis has been done and it has been incorporated in EIA-EMP report. - The gap analysis has been done by the UP Pollution Control Board, which was submitted by the UPPCB to the Oversight Committee, NGT, U.P., Lucknow, vide order dated 20.07.2020, before the Hon'ble NGT in the O.A. 710 of 2017 (Shailesh Singh vs. Sheela Hospital & Trauma Centre, Shahjahanpur & Ors.) connected with O.A.'s 711, 712&

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S. No.	Name of Person	Suggestion/Comments	Statement and Commitment of Industry Representative
		districts, then I also have no objection.	713 of 2017. - There is enough demand and supply gap as per the authenticated government department records and an emergent need for one more CBWTF to be permitted for operation in the area. plant has been taken on lease deed for 15 years in advance. Health care facilities also increase with time, so it is natural for the number of beds to increase. - Replied by the Regional Officer UPPCB SEIAA committee has the full responsibility of whether the said public hearing is approved or rejected. The complete record of the said public hearing will be sent to the SEIAA committee, the final decision will be of the SEIAA committee on the basis of merit
5	Shri, Jitendra Sharma, City-Mathura	- Work is being done by our units in Aligarh, Hathras, Kasganj and Etah districts, so that they should not interfere in the work being done in these districts. - Gap analysis has not been done by the proposed CBWTF, which is required for any	- Mathura CBWTF is at distance of 92 Km from proposed site. - The Mathura CBWTF is covering more than 10000 beds i.e. 16711 as per UPPCB Report on BMW status as on 20.01.2020 - The gap analysis has been done and it has been incorporated in EIA-EMP report.

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S. No.	Name of Person	Suggestion/Comments	Statement and Commitment of Industry Representative
		CBWTF establishment as per the rules. If they give an undertaking that they will not work in Hathras and Etah, then I will not have any objection to the establishment of the said plant.	- The gap analysis has been done by the UP Pollution Control Board, which was submitted by the UPPCB to the Oversight Committee, NGT, U.P., Lucknow, vide order dated 20.07.2020, before the Hon'ble NGT in the O.A. 710 of 2017 (Shailesh Singh vs. Sheela Hospital & Trauma Centre, Shahjahanpur & Ors.) connected with O.A.'s 711, 712 & 713 of 2017. - Replied by the Regional Officer UPPCB SEIAA committee has the full responsibility of whether the said public hearing is approved or rejected. The complete record of the said public hearing will be sent to the SEIAA committee, the final decision will be of the SEIAA committee on the basis of merit.
6	Deepanshi, Village- Pachlana	In district Kasganj, hearing is being held to set up a factory to burn the hazardous waste coming out of the hospital, all of us residents of Kumraua village and nearby villages are against the establishment of this factory, there is a danger of spreading serious diseases around, the smoke coming out	- Proposed Static Dry Incinerator is Dry Technology with fully automation and fitted with Advanced Air Pollution Control Device as per Bio Medial Waste (Management & Handling) Rules 1998 and 2016 & subsequent amendments. - All necessary air pollution control devices shall be put in place to meet

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S. No.	Name of Person	Suggestion/Comments	Statement and Commitment of Industry Representative
		of the waste which is burnt in it is expected to cause respiratory disease, which can also lead to lung cancer. Smoke can also cause diseases related to the skin of the body. Madam, there is a lot of opposition among the villagers to install it, everyone is against it, so they should not be allowed to set up a factory in hearing. Otherwise all of us villagers will sit on aamran ansan against it.	CPCB/UPPCB guidelines & BMW rules 2016. ▪ Chimney of 30 mtrs height will be provided complete with ladder, inspection platform, continuous online monitoring system, stack drain, aviation light and other accessories. ▪ Dual chambered incinerator–Fixed Hearth Incinerator (Static Type)- 200 Kg/Hrs ▪ Primary chamber operating temp - 800°C+50°C & Secondary operating at 1050°C±50°C. ▪ Residence Time of Flue gases prior exit from Sec. Chamber- 2+ seconds ▪ Refractory & insulation bricks - IS: 8-1994 & IS: 2042-2006 respectively. ▪ Total Organic Carbon (TOC) – In slag and bottom ashes <3% or Loss on Ignition (LoI)< 5% dry weight. ▪ Height of Stack -30 Mtr with sampling port holes ▪ Exit Flue gases temp- <220oC ▪ Incinerator shall be continuously monitored data ▪ Dry scrubbing Unit for flue gas prior release to environment. ▪ 80 liter/hour of diesel Demand of Fuel.

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S. No.	Name of Person	Suggestion/Comments	Statement and Commitment of Industry Representative
			Combustion efficiency (CE) shall be at least 99.00%. Zero discharge through incineration process is proposed, hence no impact is envisaged.

In the end, it was said by Smt. Harshita Mathur, District Magistrate, Kasganj, that whatever details have been kept by the unit in this meeting regarding the said project, compliance of all these points should be ensured in letter and spirit. The establishment of the industry should be done as per the guidelines issued by CPCB and State Pollution Control Board, so that the nearby residents do not face any kind of pollution or any other problem. From time to time, the Pollution Control Board also inspect the above till further operation from the construction of the referred unit and kept directing the unit to work as per the standard. For the establishment of proposed Common Bio-medical Waste Treatment Facility at Village –Kumraua, Block – Soron, Tehsil & District- Kasganj (Uttar Pradesh), it will be necessary to obtain the no-objection certificate of the village sachiv.

After this, Dr. J.P. Singh, Regional Officer, Aligarh, Uttar State Pollution Control Board, requested all to conclude and end the public hearing. Thereafter, with permission of . Smt. Harshita Mathur, District Magistrate, Kasganj, Uttar Pradesh declared the public hearing to be concluded and ended with a vote of thanks.

Based on the issues/ representation received from the public, project proponent made an time bound action plan including budgetary provision, as given below:

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Table: Time Bound Action Plan

S. No.	Activity	Action Undertaken/ To be undertaken	Cost (in Lakhs Year		Time Schedule		
			Capital	Recurring	I	II	III
1	Air Pollution	Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc	2.0	0.5			
2	Odour Issues	The following odour management are proposed in the project. • Odor concentration by spraying Herbal Inocouloums or Ecosorb (organic and biodegradable chemical) around odor generation areas at regular intervals. • Plantation of Indigenous Tree & Root Aroma to reduce the odor and to carry out the process in closed room for controlling/minimizing odor. • It shall be ensured that the bio-medical waste should be treated within 48hrs of its generation. • During transportation, the containers shall be covered in order to prevent exposure of public to odour and contamination. • Daily washing of waste collecting containers, vehicle compartment and floor of store room.	1.5	0.5			
3	Corporate Environmental Responsibility Issues w.e.t. MoEF&CC's OM dated 30.09.2020 i.e. Sanitation, Education & Health etc.	▪ Need based assistance for modernization of class rooms, renovation/ construction of school buildings, donation of computers, note books, other need-based education materials etc. ▪ Health check-up for communities in the nearby villages and distribution of medicines to the needy	5.1	2.1			
Total			8.6	3.1			

Minutes of public hearing with all details are enclosed as Annexures- XI

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Public Hearing Photographs



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CHAPTER-VIII

PROJECT BENEFITS

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CHAPTER - VIII

PROJECT BENEFITS

8.1 Introduction

The Bio-Medical Wastes Management Rules 2016 and its subsequent amendments under the aegis of Environment (Protection) Act, 1986. In the service of a huge population, these hospitals are generating “Bio-Medical Wastes” that are incompatible with the environment. These wastes need professional attention for effective management as the infectious nature of the waste can cause irreparable damage to the human health and the environment. It has become imperative to monitor and control the management and handling of these wastes.

Due to the proposed facility, hazardous bio medical waste will be properly treated and disposed but lack of segregation practices, results in mixing of hospital wastes with general waste making the whole waste stream hazardous. Inappropriate segregation ultimately results in an incorrect method of waste disposal. Various communicable diseases, which spread through water, sweat, blood, body fluids and contaminated organs, are important to be prevented. The bio medical waste spread in and around the hospitals calls flies, insects, rodents, cats and dogs that are responsible for the spread of communication disease like plague and rabies. Rag pickers in the hospital, sorting out the garbage are at a risk of getting tetanus and HIV infections. The recycling of disposable syringes, needles and other article like glass bottles without proper sterilization are responsible for Hepatitis, HIV, and other viral diseases. From the proposed facility these kinds of diseases shall be prevented to be spread from the bio medical wastes.

For the proposed facility required skilled and unskilled laborers will be utilized maximum from the local area. The increasing health care facilities increase the demand of bio medical waste management, to some extent. In brief it can be concluded that, the proposed activities will not produce adverse impact on sanitation, communication and community health, as sufficient measures have been proposed to be taken under the Environmental Management Plan. Due to proposed project, the surrounding environment will not face any problem related to pollution because all kind of wastes will be handled properly and No alteration in transport routes will be required.

8.2. Benefits from Bio-Medical Waste

8.2.1 Physical Infrastructure

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The beneficial impact of proposed project on the civic amenities will be substantial after the commencement of project activities. The basic requirement of the community needs will be strengthened by extending healthcare to the community, building/strengthening of existing roads in the area which will help in uplifting the living standards of local communities.

8.2.2 Employment Opportunities

The project will create opportunities for employment. Skilled and unskilled manpower will be needed. Secondary jobs are also bound to be generated to provide day-to-day needs and services to the work force. This will also temporarily increase the demand for essential daily utilities in the local market. Due to this proposed project, relevant to this project other job opportunities may generate which will improve the socio economic status of the area.

Neighboring villagers of the project will get its benefits more by giving preference to them in relation to direct employment associated with the various project activities. Construction and operation phase of the proposed project will involve a certain number of laborers, contractors and construction workers. There is a possibility that local people will be engaged for this purpose. The operation phase will involve a number of skilled and unskilled workers. The total 42 manpower will be required for this project. There is a possibility that local people will be engaged for this purpose to the extent possible and hence improve the existing employment scenario of the region. First preference will give to localize people for all kind of required employment in the project and especially for unskilled employment the company will take localize people.

8.3 Improvements in the Social Infrastructure

The project will definitely improve the social infrastructure of the Kasganj district and also the neighbouring districts where the services are expected to be catered. The proper collection of bio-medical waste will solve the problem of accumulation of unattended wastes. This will lead to reduction of direct contact with the people and stray animals. The health care establishments will be able to comply with the Bio-medical waste management and handling rule and people will have a healthy living condition.

8.4 Other Tangible Benefits

- Additional housing demand for rental accommodation will increase
- Cultural, recreation and aesthetic facilities will also improve.
- Improvement in communication, transport, education, community development and medical facilities.
- Overall change in employment and income opportunity.

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8.5 Swot Analysis

- SWOT Analysis is a useful technique for understanding your Strengths and Weaknesses, and for identifying both the Opportunities open to you and the Threats you face. What makes SWOT particularly powerful is that, with a little thought, it can help you uncover opportunities that you are well placed to exploit. And by understanding the weaknesses of your business, you can manage and eliminate threats that would otherwise catch you unawares.



- More than this, by looking at yourself and your competitors using the SWOT framework, you can start to craft a strategy that helps you distinguish yourself from your competitors, so that you can compete successfully in your market.
- It views all positive and negative factors inside and outside the firm that affect the success. A consistent study of the environment in which the firm operates helps in forecasting/predicting the changing trends and also helps in including them in the decision-making process of the organization.
- The other approaching method that can be implemented was SWOT analysis. SWOT is an acronym for strengths, weaknesses, opportunities and threats. A SWOT analysis is a technique commonly used to assist in identifying strategic direction for an organization or practice.
- The strengths and weaknesses of a system are determined by internal elements, whereas external forces dictate opportunities and threats. Strengths can be defined as any available resource that can be used to improve its performance. Weaknesses are flaws/shortcomings of any system that may cause to lose a competitive advantage, efficiency or financial resources.

Strengths:

- Employing scientific method for disposal of Bio-Medical waste.
- Recovering reusable and receiving recyclable materials from Bio-Medical waste.
- Cheaper option for disposal of Bio-Medical waste in scientific manner.
- Maintenance of the project site more properly to prevent the effect to the surrounding area and environment with using the sufficient equipment and facilities, and the technology such as daily cover and insect prevention.

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Weakness:

- High capital investment for treatment of Bio-Medical waste.
- Availability of out dated data about Bio-Medical waste generated.

Opportunities:

- Facilities available for similar kind are expensive or of poor environmental conditions.
- Having a brand name in waste management operations in all other parts of country.

Threats:

- Lot of competition in the market with existing similar facilities.
- New marketing companies launch by competition.
- Strong relationship between treatment facilities and hospitals.
- Launch of new technologies and innovative marketing strategies by competitors.

8.6 Conclusion

In this study, SWOT analysis was determine the strategic that contain with building on strengths, minimizing weaknesses, exploring opportunities and counteracting threats. Strategies have been identified and formulated from the SWOT matrix in relation to increasing government role, participation of the inhabitant and CBWTF conditions for the Bio-Medical waste management.

The strategies that resulted from this analysis were focused on the inhabitant participation and environment consideration. For purposeful of the inhabitant participation, strategies that arise was connected with the: educating the inhabitant, increasing the role of student and young people to involve in the system, increasing the awareness, increasing the effort to recycle and encourage the habitant to use the recycle material. All the strategies cannot be conducted by the community or by the government separately.

The strategies for the environment consideration were focused in managing the Common bio-medical waste management facility site more properly. The strategies were concern to prevent the bad effects to the environment and the influence of the CBWTF site operation to the inhabitant at the surrounding area.

The analysis result showed that SWOT analysis was the one of approaching system that could be used as the tools for maintain the Bio-Medical waste management system in with the strategies that use the inhabitant participation and environment as the considering factors for approaching.

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CHAPTER-IX

COST BENEFIT ANALYSIS

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CHAPTER – IX

COST BENEFIT ANALYSIS

9.1 Cost Benefit Analysis

The Cost Benefit Analysis is not prescribed in the granted Terms of Reference (ToR) vide Letter no. 93/Parya/SEIAA/6191/2021 dated 11th June 2021. Hence, the same is not carried out for the project.

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CHAPTER-X

ENVIRONMENT

MANAGEMENT

PLAN

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CHAPTER – X

ENVIRONMENT MANAGEMENT PLAN

10.1 Introduction

Industrial development is associated with a few positive and negative impacts on the environment. The negative impacts should not hinder industrial development but they should be properly mitigated. An environmental management plan (EMP) has been prepared for the proposed facility, to minimize negative impacts and is formed on the basis of prevailing environmental conditions and likely impacts of this project on various environmental parameters. This plan will also facilitate monitoring of environmental parameters. Preparation of EMP is required for the formulation, implementation and monitoring of environmental protection measure. EMP includes schemes for proper and scientific treatment and disposal mechanism for air, liquid and solid hazardous pollutants. Apart from this, green belt development, safety aspect of the workers, noise control, fire protection etc. are also included in it. The various components of the EMP are outlined in subsequent sections.

10.2 Purpose of Environmental and Management Cell

Various purposes of the environmental management plan are:

- To treat and dispose off all the pollutants viz. air, liquid, gaseous and solid waste so as to meet statutory requirements (Relevant Pollution Control Acts) with appropriate technology. It will help to reduce the adverse effect on human being as well as on environment due to the proposed facility.
- To support and implement work to achieve environmental standards and to improve the methods of environmental management.
- To promote green-belt development.
- To encourage good working conditions for employees.
- To reduce fire and accident hazards.
- Budgeting and allocation of funds for environment management system.
- To adopt cleaner production technology and waste minimization program.

10.3 Environmental Management during Construction

The impacts during the construction phase on the environment would be basically of temporary nature and are expected to reduce gradually on completion of the construction activities.

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10.3.1 Air Quality Mitigation Measure

For the proposed project site leveling and grading will be carried out if required, where ever possible to maintain the natural elevations they will not be disturbed, only leveling activity will be carried out for providing roads, sewage network, storm water system, and places required for construction of sheds and administrative buildings. According to the engineering assessment, most of the excavated muds generated during construction activities will be reused within the project site for leveling during road formation etc. The excess if any will be given to local contractors for disposal in low lying areas, road construction use etc.

During construction period most of the dust will be generated from the movement of construction vehicles on unpaved roads. Unloading and removal of soil material shall also act as a potential source for dust nuisance. The control measures proposed to be taken up are given below.

- Water sprinkling on main haul roads in the project area will be done, this activity will be carried out at least twice a day, if need arises frequency will be increased on windy days, in this way around 50% reduction on the dust contribution from the exposed surface will be achieved.
- The duration of stockpiling of excavated mud will be as short as possible as most of the material will be used as backfill material for the open cut trenches for 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 using drip irrigation or by regular watering so that the area will be moist for most part of the day.
- All vehicles carrying raw materials will be instructed to cover with tarpaulin / plastic sheet, unloading and loading activity will be stopped during windy period.

To reduce the dust movement from civil construction site to the neighborhood the external part of the construction activity will be covered by plastic sheets.

10.3.2 Water Quality Mitigation Measure

During site development necessary precautions will be taken, so that the runoff water from the site gets collected to working pit and if any over flow is, will be diverted to nearby greenbelt / plantation area. During construction activity all the equipments washed water will be diverted to

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working pit to arrest the suspended solids if any and the settled water will be reused for construction purposes, and for sprinkling on roads to control the dust emission, etc.

The waste generated from the site work shop will be segregated like used oil, lubricants, etc and disposed to authorized recyclers the waste like soiled cotton, paper, etc will be disposed to dump/Landfill.

The domestic wastewater generated from temporary toilets used by the work force will be diverted to septic tank followed by soak pit. Therefore, impact on water quality due to proposed unit would be insignificant.

10.3.3 Noise Mitigation Measure

Noise generating equipment will be used during day time for brief period of its requirement. Proper enclosures will be used for reduction in noise levels, where ever possible the noise generating equipment will be kept away from the human habitation. Temporary tin sheets of sufficient height (3m) will be erected around the noise generating activity or all around the project site as barrier for minimizing the noise travel to surrounding areas. Therefore, impact on noise environment due to proposed project would be insignificant.

All vehicles entering into the project will be informed to maintain speed limits, and not blow horns unless it is required. Personal protective equipment like earmuffs, helmets covering ears would be provided to the workers working near noise generating equipment and would see that workers use the protective gadgets regularly.

10.3.4 Solid Waste Mitigation Measure

The solid waste generated during construction period being predominantly inert in nature, construction and demolition waste does not create chemical or biochemical pollution. However maximum effort would be made to reuse and recycle them. The most of the solid waste material will be used for filing/levelling of low-laying areas, as road construction material, if any excess given to local contractors for lifting and dumping in low lying areas. All attempts would be made to stick to the following measures.

- All construction waste shall be stored within the site itself. A proper screen will be provided so that the waste does not get scattered.
- Attempts will be made to keep the waste segregated into different heaps as far as possible so that their further gradation and reuse is facilitated.
- Materials, which can be reused for purpose of construction, levelling, making roads will also

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be kept in separate heaps from those which are to be sold or land filled.

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. It would, however, be desirable to have quality standards for the recycled materials. Construction waste can 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/ auction of materials which cannot be used at the site due to design constraint
- Plastics, broken glass, scrap metal, used cement bags, etc can be sent for recycling in the industries.
- Rubble/ brick bats can be used for building activity, such as levelling, under coat of lanes where the traffic does not constitute heavy moving loads.
- Larger unusable pieces can be sent for filling up low laying areas.
- Fine material such as sand, dust, etc can be used as cover material
- The unearthed soil can be used for levelling as well as for lawn development
- The broken pieces of the flooring material can be used for levelling in the building or can be disposed off
- The unused or remaining paints/varnishes/wood can either be reused or can be disposed.

10.3.5 Land Environment

Following steps are proposed to take care of impact of construction activity on project land area:

- On completion of civil works, all debris etc. will be completely removed from site to avoid any incompatibility with future use.
- Other materials like paint, diesel etc. will be properly stored and handled to prevent any spillage on land.
- All the wastes will be stored at a designated site within the premises to prevent scattered discharge on land.

10.3.6 Ecology- Greenbelt Development Plan

The Unit in an area of 4081 Sq.m. Greenbelt is recommended as one of the major components of Environment Management Plan. The proposed greenbelt area is about 1348 Sq.m (33.01 %). As per MoEF&CC guidelines total no. of trees for greenbelt of 1348 Sq.m would be about 107 nos.

These species can be also available near the forest department nurseries. The Major tree species proposed for plantation in the plant area are tabulated in below:-

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TABLE -10.1(a) LIST OF PLANTS FOR GREEN BELT

Sl. No.	Common Name	Biological Name	Its Significance for pollution control
1	Neem	Azadirachta indica	Noise barrier, Pollution sink, Economic & Medicinal Value, Medicinal, Evergreen & Timber
2	Ashok	Polyalthia longifolia	Ornamental & Evergreen
3	Sheesham	Dalbergia sissoo	Economic Value, Pollution Sink
4	Bargad	Ficus bengalensis	Noise barrier, Pollution sink, Shade, Supports other species, Religious values, Foliage & Canopy
5	Pipal	Ficus religiosa	Noise barrier, Pollution sink, Shade, Supports other species, Religious values , Medicinal and deciduous in winter
6	Arjun	Terminalia arjuna	Noise barrier, Pollution sink
7	Amaltas	Cassia fistula	Landscaping, Flowering plant, Pollution sink , Amaltas
8	Gulmohar	Delonix regia	Ornamental & Evergreen

Proper attention and management is required to maintain the survival rate of the planted species. The following guidelines are suggested & will be followed by the proponent for future operations of greenbelt development & maintenance.

Guidelines for Greenbelt Development

- Design and development of greenbelt will be in adherence to industry-specific requirements and prevalent climatic conditions.
- Unit will ensure healthy & dense greenbelt throughout the project life.
- Unit will follow CPCB guidelines for development & maintenance of greenbelt area.
- Unit will ensure regular irrigation & fertilization of greenbelt area as required timely.
- Unit will ensure re-plantation in greenbelt area depending upon the survival rate of planted vegetation to maintain greenbelt.
- Unit will plant trees with density of about 1500 trees per hectare or developing the greenbelt area.
- Indigenous species with fast growth are only selected or form the base of selection as Greenbelt can come in view as fast as possible.
- The trees will be planted in three-tier pattern to ensure that the entire area covered and ensure effective pollution abatement. For this, management will ensure that plantation of trees will include mixture of lower, higher and middle canopy structure, which will be mixed appropriately / proportionately / uniformly.

Among the various native plant species evaluated during the research studies, Azadirachta indica and Polyalthia longifolia are identified as keystone species which comes under excellent category.

Small herbs, grass varieties, climbers, ornamental and flowering plants can also be raised as per the availability in the plant area.

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Care will be taken to plant trees along the roadside, boundary wall as well as plant premises. It will enable proper balance of atmosphere both outside the unit by absorbing noise and gaseous pollutants of the roadside movement of vehicles and also absorption of noise and emissions within the premises of the plant.

TABLE -10.1(b) LIST OF PLANTS FOR GREEN BELT

S.No	Botanical Name	Common Name	As per CPCB Manual	Site	No.	Space in m	Each	Area (m2)	Tolerance level for pollution
1	Azadirachta indica	Neem	A44	Plant area	10	5x5	25	250	Tolerant
2	Dalbergia sissoo	Sheesham	D2	Plant area	10	5x5	25	250	Tolerant
3	Delonix regia	Gulmohar	D3	Plant area	10	3x3	9	90	Sensitive
4	Ficus bengalensis	Bargad	F1	Plant area	10	5x5	25	250	Tolerant
5	Terminalia arjuna	Arjun	T6	Plant area	10	3x3	9	90	Tolerant
6	Polyalthia longifolia	Ashok	P9	Plant area	19	2x2	4	76	Sensitive
7	Cassia fistula	Amaltas	C7	Plant area	18	3x3	9	162	Tolerant
8	Ficus religiosa	Pipal	F7	Plant area	20	3x3	9	180	Tolerant
					107			1348	

2nd Column in the above table shows that List of plant species suggested by CPCB manual.

*Guidelines for the development of Greenbelts. Published by Envis Centre, CPCB, (Programme objective series: PROBES / 75 / 1999-2000, 210 pp.

- Tall trees towards boundary wall proposed
- Medium sized trees next row to tall trees
- Small trees next row
- Near entrance gate & Open area provided for plantation

Unit will follow the following three-year comprehensive programme

- Unit will follow the following three -year comprehensive greenbelt development program after that the company will keep following the prevailing practices of greenbelt management.
- Unit will regularly assess survival rate of planted trees & shrub and if required necessary re-plantation will be done to ensure healthy & dense greenbelt area in proposed premises.
- For re-plantation, if required, Industry will acquire saplings from local private/government nursery.
- Unit will do fertilization as required for healthy & dense greenbelt development.

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TABLE -10.1(c) Greenbelt Development -:Year Wise Plantation Program

S. No.	Year of Plantation	Proposed Plantation	Area Covered SQM	Budget	
				Capital Cost (Rs In Lacs)	Recurring Cost per annum (Rs In Lacs)
1	I st Year	36	450	5.0	1.0
2	II nd Year	36	450	-	0.50
3	III rd Year	35	448	-	0.50
	Total	107	1348	5.0	2.0

10.3.7 Socio-Economic

As there will be no temporary housing colony for construction workers, neither socio - economic impact due to the same is envisaged.

Overall socio - economic effect of construction phase will be positive due to direct and indirect employment opportunity for the local livings. Local people from nearby villages of the surroundings from the site will be employed for construction work to the maximum extent possible.

10.4 Management during Operation Phase

Operation phase of any industry being longer in duration and because of its potential to create continuous impacts is quite important from the impact point of view. Comprehensive and effective EMP has to be prepared and implemented to safe-guard environmental concerns during operation phase of any unit.

10.4.1 Air Quality Management

The air pollutants in the plant may be classified broadly into particulate matter like dust, fumes etc. and gases like Sulphur dioxide, Nitrogen oxide and Hydrogen chloride etc. The measure to control the air pollution will ensure the ambient air quality standards as laid down by Central Pollution Control Board for industrial areas. The system proposed for air pollution control will provide acceptable environment condition in the working areas and abate air pollution in the surrounding area of the plant. The technological equipment and processes have been selected with the above objectives. Depending on quality of emission from different sources, suitable air pollution control system will be provided. The chimney height will be as per CPCB norms to ensure ground level concentration of different pollutants within permissible limit. Once the hopper lid and enclosure door is closed, shredder operates as a closed system. This also avoids any dust generation etc.

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Following measures are proposed to mitigate negative impact of operation phase of the project on the surrounding air environment:

- Height of all the stacks will be as per statutory requirement. Incinerator stacks will have stack monitoring facility (SMF) consisting of sampling port-hole, platform and access ladder.
- Adequate spares of critical components of dust collection systems will be kept to ensure trouble – free operations and continuous compliance to emission norms.
- A comprehensive plan for fugitive emission control based on CPCB guidelines will be followed.
- Transport vehicles will be properly maintained to reduce air emissions.
- Vehicles will be periodically checked for pollutant emissions against stipulated norms.
- Idle running of vehicles will be minimized during material loading / unloading operations.

10.4.2 Odor Control

The odor management is one the issue in CBWTF. The main aim is to minimize the number of sources of odor generation which exist in site. To undertake direct management of odor generating sources that give rise to odor problems.

The mitigation measures proposed to minimize and control odor are as follows.

- Plantation of trees to reduce the odor and to carry out the process in closed room for controlling/minimizing odor.
- Good housekeeping practices.
- It shall be ensured that the total time taken from generation of bio-medical waste to its treatment, which also includes collection and transportation time, shall not exceed 48 hours.
- Dilution of odorant by odor counteraction or neutralize by spraying Ecosorb (organic and biodegradable chemical) around odor generation areas at regular intervals.
- Covering the landfill area under operation daily with layer of earth, clay or a similar material.
- Covering by using heavy duty hessian, plastics and foams odor can be minimized.

10.4.3 Water Quality Mitigation Measures

Total water requirement for the proposed facility would be 5 KLD. Water conservation measures shall be taken to optimize the fresh water requirement. Moreover, record of water consumption for different usages shall be maintained

- Proper and sufficient sanitary facility will be provided to construction workers to maintain hygienic conditions at site. The sewage is disposed by the septic tank followed by soak pit.

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- Philosophy of maximum use of treated waste water within the plant will be adopted to minimize consumptive water requirements and to achieve “zero” effluent discharge from the plant.
- Adequate spares for effluent collection, handling, treatment and disposal system shall be maintained.
- Records of analysis results of treated and untreated wastewater should also be maintained.
- Record of the wastewater generation and recycle shall be maintained on printed logbook/computer.
- Proper housekeeping shall be adopted to prevent spillages and contaminated surface runoff going to storm water drains.
- The ground water quality around the site should be examined regularly.
- Wastewater generated from air pollution control devices/ vehicle and floor wash etc. shall be treated in in-house ETP and shall be reused in APCDs

Rain water harvesting scheme:

Storm water drains shall be provided throughout the facility taking topography into consideration. The storm water drains are connected to rain water collection chamber. The rain water thus collected shall be used for greenbelt, vehicle washing etc., after treatment, if necessary.

10.4.4 Noise Mitigation Measures

The main sources of noise generation is due movement of vehicles carrying waste, all vehicle (drivers) entering into the project will be informed to maintain speed limits, and not blow horns unless it is required. Necessary speed controlling bumps will be placed near weighbridge and entrance of the site.

The other areas where noise generation is anticipated is incinerator section, DG set room, necessary personal protective equipment like earmuffs, helmets covering ears would be provided to the workers working near noise generating equipment and would see that workers use the protective gadgets regularly. Regular maintenance of the equipment will be carried out as per the schedule given by suppliers. The noise pollution management measures proposed is given below.

- Acoustic Enclosure for all the high noise level equipment's
- All the design/installation precautions as specified by the manufacturers with respect to noise control are strictly adhered to
- Major noise generating sources are insulated adequately by providing suitable enclosures

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- Other than the regular maintenance of the various equipment, ear plugs are provided to the personnel close to the noise generating units
- All the opening like covers, partitions are designed properly.

10.4.5 Land Environment

Treated effluent will be utilized for gardening/plantation after ensuring norms specified by pollution control board by which impact on soil and ground water will be insignificant. Waste such as incineration ash generated in the process of incineration shall be stored in a separate area under the shed so as to avoid entry of rain water during the monsoon and for easy collection and in case, incineration ash is hazardous waste in nature same shall be disposed at TSDF Site i.e. Site No. 2, M/s U. P. Waste Management Project. (A Division of Ramky Enviro Engineers Limited), Plot No. 672, NH-2, Kumbi(VIII), Akbarpur, Dist.:- Kanpur Dehat, - 209101.

10.4.6 Solid Waste

Solid wastes shall be generated in the form of Incineration ash from Incinerator, ETP sludge from ETP process and used oil from the plant utility. Following steps shall be taken;

- Incineration ash from incinerator will be temporarily stored at ash storage pit and finally it will be disposed to the nearest authorized TSDF site.
- Incineration ash and ETP sludge will be sent to authorized TSDF site
- Used oil will be properly stored and it will be re-used as lubricants in the machineries within the premises only.
- Record of solid waste generation and disposal shall be maintained.
- All Necessary precaution shall be taken during handling, loading and unloading of solid waste.

10.4.7 Socio-Economic Environment

Total population of the study area is 125026 persons. Out of which 67554 are male and 57472 are female. In SC category 10271 female to 11639 male and in ST category males are 0 to 0 Female .

Literacy Rate is the amount of people in a country with the ability to read and write. The analysis of the literacy levels is done in the study area. Literacy in any region is key for socio-economic progress and the Indian literacy rate grew to 59.36% in 2011. The study area experiences a considerably average literacy rate of 51.14% (2011).

10.4.8 Occupational Health Management

There will be routine observation of health as certain sufferings are likely to appear as result of exposure by the workers during operations of various facilities. All the employees shall be required

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to undergo a medical checkup before joining the facility. Medical checkup will be conducted on regular basis and the health conditions will be monitored. First aid facilities required to attend immediately for meeting emergency situations shall be made available at the facility.

10.5 Fire Protection System

The fire protection system will protect the entire site area from fire hazards happening accidentally. This fire protection system comprises of a ground level water storage tank to store the anticipated requirement of water. One electric motor driven pump and one diesel high pressure pumps will be provided to pump the water to a high pressure header from where the water is distributed to various high pressure hydrants provided at selected locations. Necessary fire hoses terminated with spouts will be kept ready at each hydrant location to facilitate firefighting.

10.6 Environmental Management Cell

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

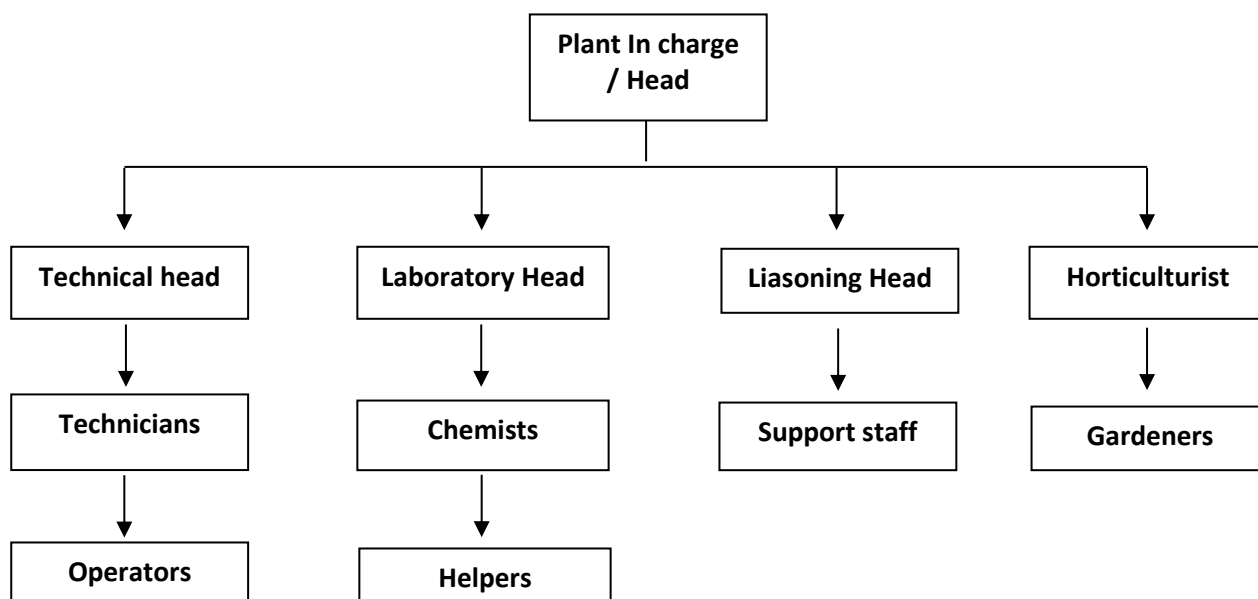
The cell will also be responsible for monitoring of the plant safety and safety related systems which include:

- Checking of safety related operating conditions.
- Visual inspection of safety equipments.
- 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.

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- 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: ORGANIZATION SETUP OF ENVIRONMENTAL MANAGEMENT



10.7 Budgetary Provision for EMP

In order to comply with the environmental protection measures as suggested in the above section, a budgetary provision for Environmental Protection is given in:

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TABLE-10.2 BUDGET OF IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLAN

S. No.	Particulars	Capital Cost (Rs) lakhs	Recurring Cost (Rs) lakhs/annum
1	Air Pollution Control Systems Wet Scrubber, quencher etc. ETP Plant etc	20	5
2	Odor and Noise Control Measures	5	2
3	Landscaping and Greenbelt Development	5	2
4	Storm Water Drains & Storage Tanks	2	2.5
5	Ambient Air Monitoring & Online Stack Monitoring	10	0.5
6	Ash Disposal	1	4
7	Health Care (Performing free Cataract surgeries, Infrastructure support to area Govt. Hospitals like providing bed and equipment for treatment etc.) COVID financial assistance	0.85	0.10
8	Promoting Education (providing infrastructure like construction of additional class rooms, furniture, smart class facilities, support to special children education /therapy etc. in nearby village)	0.85	0.10
9	Environment care (taking up avenue plantation, Plantation in communities, providing solar power/ lights, rain water harvesting etc.)	0.85	0.10
10	Rural Development (laying roads, construction of drains, community halls, other infrastructure for development of surrounding villages)	0.85	0.10
Total		46.4	16.4

The proposed capital cost for the project is INR 1.72 Crores and total investment on environmental improvement i.e EMP works is envisaged Rs. 46.4 lakhs/- and recurring expenditure during the stage of operation is Rs. 16.4 lakhs/- as recurring investment is earmarks for EMP.

As per the directions given in the MoEF&CC Office Memorandum, F.No. 22-65/2017-IA-III on 30th September 2020, all the proposed activities will be part of Environmental Management Plan (EMP) instead of CER.

Addition to above the project proponent has proposed to invest amount of 2.55 Lakhs per year on Labours safety, proper sanitation facilities at site, Health checkup facilities, awareness & recreation programs etc. below table is the breakup proposed for budget investment for labours working in this proposed project.

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TABLE-10.2 BUDGET BREAKUP FOR LABOUR

S. No.	Activity	Budget (in lakhs/Year)
1.	Safe Drinking Water	0.50
2.	Urinal , Latrine and Bathrooms	1.00
3.	PPE and Safety equipment will be Provided	0.20
4.	First Aid facility	0.20
5.	Regular Health checkup and provision of medicine	0.35
6.	Educational and awareness programme for safety measures & Recreational program	0.30
Total		2.55

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CHAPTER-XI

SUMMARY &

CONCLUSION

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CHAPTER – XI

SUMMARY & CONCLUSION

11.1 INTRODUCTION

Management of pollution and Bio-Medical Waste generated from the hospitals has always been a challenging task faced by the country. M/s. Indo Tech Waste Solution is a Firm, registered under the Indian Partnership firm registration Act, with the primary objective of being the Waste Management service provider with the purpose of best in waste management service provider in country which is focused in the areas of Biomedical Waste Management.

As per EIA Notification S.O.No 1533 dated 14th Sep 2006 the proposed project is falling under 7 (da) as “Bio-Medical Waste Treatment Facility”, Category “B” as per S.O.1142 (E) Notification dated 17th April 2015 issued by MoEF&CC and published in Gazette of India on 30th April 2015 and requires environmental clearance from SEAC Madhya Pradesh. The proposal was considered in SEAC, Uttarpradesh meeting held during 09th March 2021 and SEIAA meeting held on 21st May 2021 for determination of the Terms of Reference (TOR) for undertaking detailed EIA Study. The SEIAA has awarded ToR vide its letter No-93/Parya/SEIAA/6191/2021 dated 11 June 2021 attached as annexure – I.

The objective of the project is to establish a Common Bio-medical Waste Treatment Facility for scientific treatment of Bio-medical waste from the covering areas while redesigning & improving the existing BMW management system in an environmentally and economically sustainable manner.

11.2 IDENTIFICATION OF PROJECT PROPONENT & PROJECT

Identification of project proponent

Applicant	Authorize signatory
M/s. INDO TECH WASTE SOLUTION, <u>Address-</u> Kheri Road, Shop No-2, Sector-98, Faridabad, Haryana <u>Pin code:</u> 121002 <u>Telephone</u> - +91-6287097232	Mr. Raman Kumar (Partner) <u>Address-</u> Kheri Road, Shop No-2, Sector-98, Faridabad, Haryana Pin code: 121002 <u>Email</u> – kumarraman9999@gmail.com

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Identification of project-

Common Biomedical Waste Treatment and Disposal Facility (CBWTF) provide services to Health Care Units for collection of BMWs for its final disposal to their site. Biomedical Waste Rules 2016 and its subsequent amendments, stipulates that occupier of every organization generating biomedical waste (as defined in the Rules) must manage his biomedical waste as prescribed in the Rules so as not to cause any harm to the environment.

Common Bio-Medical Waste Treatment Facility plays an important role to curb the infectious diseases that spreads from the bio-medical wastes without proper treatment. The concern about disposal of infectious wastes generated by the health care units is increasing rapidly due to the fear of the spread of viruses. These wastes (bio-medical wastes generated from health care establishments) present a high risk of causing potential damage to the human health and the environment by way of spreading. To prevent the spread of such infectious disease causing vectors, a scientific approach is required. It is essential that professionally trained personnel should handle the wastes and that the wastes should be disposed scientifically.

TABLE-11.1: SUMMARY OF THE PROJECT

S. No.	Parameters	Description															
1.	Proposed Project	Common Bio-medical Waste Treatment Facility															
2.	Project Activity	7(da)- Bio-Medical Waste Treatment Facilities															
3.	Proposed Project Capacity	The proposed project has been designed to cater 10,000 beds per day. Current BMW Waste Generation- 10,000 beds The proposed project will cover 75km or more if required as per authority requirements. Proposed Equipments:- Incinerator- 200 kg/hour Autoclave- 250 kg/batch or 2500ltr/hour Shredder- 150 kg/hour Effluent Treatment Plant- 5 KLD															
4.	Location	Kumraua Village, Block- Soron District- Kasganj, Uttar Pradesh <table border="1"> <thead> <tr> <th>S.No.</th><th>Latitude</th><th>Longitude</th></tr> </thead> <tbody> <tr> <td>A</td><td>27°57'28.14"</td><td>78°36'34.74"</td></tr> <tr> <td>B</td><td>27°57'29.41"</td><td>78°36'37.18"</td></tr> <tr> <td>C</td><td>27°57'30.85"</td><td>78°36'36.09"</td></tr> <tr> <td>D</td><td>27°57'29.53"</td><td>78°36'33.70"</td></tr> </tbody> </table>	S.No.	Latitude	Longitude	A	27°57'28.14"	78°36'34.74"	B	27°57'29.41"	78°36'37.18"	C	27°57'30.85"	78°36'36.09"	D	27°57'29.53"	78°36'33.70"
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C	27°57'30.85"	78°36'36.09"															
D	27°57'29.53"	78°36'33.70"															
5.	Total Area	4081 Sqm (0.408 ha)															

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6.	Plot No/Khasra No-	Khasra No- 1161
7.	Land Ownership	Lease Land for 15 years by Mr. Raman Kumar of M/s Indo Tech Waste Solution
8.	Water Requirement & Source	Water requirement for the proposed CBWTF project is approx. 5 KLD. Source: Bore Well & External Water Tankers.
9.	Project Cost	Rs- 172/-Lakhs (1.72/- Crore)
10.	Nearest Water Bodies/Rivers	Paraller Lower Ganga Canal- 2.93km (W) Burhiganga Nala- 3.94km (E) Ganga River- 4.31km (N)
11.	Power Requirement & Source	62 KW, Source- Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL). DG set (62.5 KVA) is proposed for power backup.
12.	Manpower Requirement	During Construction phase approx..-15 persons will be hired from nearby Villages of impact area around 10 KM preferably and in absence of such cases we hire from outside. Number of persons required in operational phase- 42no.
11.	Nearest Railway Station	Kasganj Railway Station – 16.10 km in S
12.	Nearest Airport	Agra (Pt. Deen Dayal Upadhyay) Airport- 110km in SW
13.	Nearest Town/Habitation	Nagla Mukhram 802 meter in NE and Pachlana 1 Km in NNE
14.	Seismic Zone	Seismic Zone- IV

11.3 NEED OF PROJECT

In Uttar Pradesh most of the Hospitals, Primary Health Care establishments, etc., does not have treatment facilities. Kasganj district also does not have any Common Bio-medical Waste Management Facility on its own. As per BMW Rules 2016 there is no CBWTF is available within 75Km radius.

And it may not be possible for small nursing homes, dispensaries, clinical laboratories and other small organizations or individual medical professionals to carry out treatment and disposal of bio-medical waste generated as per the methods prescribed in the rules on their own. It is not economical for even bigger hospitals to have their own treatment facilities.

The proposed project will collect wastes as categorized under the Bio-medical Waste Management Rules, 2016, generated from all health care establishments within a radius of 75 km or more if

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required as per authority requirement. The collected waste will be transported to the project site, treated and disposed-off as per the stipulated options provided in the BMW Management Rules, 2016.

Proper collection and timely treatment of COVID waste is extremely important to control the spread of the disease. It is proposed to collect and treat COVID waste in compliance with Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of COVID-19 Patients by CPCB dated July 17, 2020.

11.4 LAND DETAILS

The proposed Common Bio-Medical Waste Treatment Facility will be established in an area of (4081 Sq. m.) located at Khasra No. 1161, Village-Kumroua, Block- Saron, Tehsil & District- Kasganj Uttar Pradesh. The proposed land has been applied for conversion for industrial land use to establish the proposed common bio-medical waste treatment facility via Revenue Council Uttar Pradesh online portal case no. T20211875999013601 under U.P Rajrakh Sahitya, 2006 (its amendment 2016) section 80 (1) on dated; 11.10.2021. The Proposed Land is taken on lease by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution for 15 years.

TABLE - 11.2 LAND DETAILS

S. No	Tehsil	Village	Khasra/Plot/Block No.	Hactares
1	Kasganj	Kumraua	Khasra No- 1161	0.408
Ownership: The Proposed Land is taken on lease by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution for 15 years.				

TABLE - 11.3 LAND BREAK UP FOR PROJECT SITE

S.No.	Components/Particular	Area in SQ.M.	Percentage
1	Build up Area (Autoclave, Shredder etc..)	831.00	20.36
2	Incinerator Area	334.00	8.18
3	E.T.P Area	25.00	0.61
4	Road Area	1055.00	25.85
5	Green Belt	1347.00	33.00
6	Open Area	489.00	11.98
Total Area		4081.00	100

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11.5 DESCRIPTION OF PROPOSED SITE FACILITY

- Water Requirement**

The total water requirement during construction phase will be approx. 2 KLD and during operational phase will be approx. 5 KLD. Source- Bore Well & External Water Tankers.

TABLE - 11.4 WATER REQUIREMENT

S. No.	Activity	Total Water	Treated Water (Requirement)	Discharge to ETP
1.	Floor, Vehicle, wheel Washing, Water Sprinkling	1.4KLD	0.7 KLD	1.9 KLD
3.	Boiler Blow down	.1 KLD	-	0.08 KLD
4.	Domestic use	2 KLD	-	Sent to Soak Pit/Septic Tank
5.	Gardening	1.5 KLD	1 KLD	-
Total		5 KLD	1.7 KLD	2 KLD

- Power requirement**

Total Power requirement 62 KW will be supply from Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL) cater to the needs of the BMW facility. Sufficient capacity DG set (62.5 KVA) is proposed for power backup

- Manpower requirement**

During Construction phase approx.- 15 persons will be hired from nearby Villages of impact area around 10 KM preferably and in absence of such cases we hire from outside. Number of persons required in operational phase is proposed below:

TABLE - 11.5 MANPOWER DETAILS

Sr. No.	Manpower/Profile No.	Number
1.	In Plant	8
2.	Administration	4
3.	Marketing	6
4.	Drivers/ Helpers/ Office	24
5.	TOTAL	42

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11.6 BASELINE MONITORING STATUS

The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during summer season i.e. March to May 2021. The various environmental components which are thoroughly studied during the study period include:

- ❖ Water Environment (surface and ground water)
- ❖ Air Environment
- ❖ Noise Environment
- ❖ Biological Environment
- ❖ Socio- Economic Environment

11.6.1 WATER ENVIRONMENT-

In order to conduct EIA Studies, baseline data pertaining to water environment of the proposed project was carried out evaluating the basic characteristics, drainage pattern, and hydrology. Water Environment of the area has been studied by locating ground water sources. During the study period, a total of 8 ground water samples and 3 surface water samples were collected from the study area in order to assess the water quality. Ground water samples were drawn from hand pumps and bore wells used by the villagers for their domestic needs. Surface water samples were collected from river/nallas/lake in the study area. These samples were taken and were analysed for various parameters and compared with standards IS: 10500.

Ground Water Quality:

- The pH limit fixed for drinking water samples as per IS 10500-2012 is 6.5 to 8.5 beyond this range the water will affect the mucus membrane and or water supply system. During study period the pH in the ground water samples was varying from 6.96 to 7.28. The pH of all samples was falling within the acceptable limit.
- The acceptable limit for total dissolved solids as per IS 10500:2012 is 500 mg/l, whereas the permissible limit in absence of alternate source is 2000 mg/l, beyond this palatability decreases and may cause gastro intestinal irritation. In water samples collected from the study area, the total dissolved solids in groundwater are varying from 216 to 703 mg/l. Six sample is falling within acceptable limit and two samples are falling above acceptable limit but within permissible limit.

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- The acceptable limit for chloride is 250 mg/l as per IS10500:2012 whereas the permissible limit of the same is 1000 mg/l beyond this limit taste, corrosion and palatability are affected. The Chloride levels in the ground water samples collected in the study area were ranging from 16 to 74 mg/l. All samples are falling within acceptable limit.
- The acceptable limit as per IS10500:2012 for hardness is 200mg/l whereas the permissible limit for the same is 600mg/l beyond this limit encrustation in water supply structure and adverse effects on domestic use will be observed. In the water samples collected from the study area, the hardness is varying from 144 to 388 mg/l. All three samples are falling above the acceptable limit and five samples are falling above the acceptable limit but within permissible limits.

Surface Water

- The pH was varying between 7.11 to 7.29. The pH values for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS: 2296-1992.
- The total dissolved solids were in the range of 122 to 156 mg/l. The TDS for all the samples collected in the study area during study period were meeting the Class 'A' norms as per IS:2296-1992.
- The chlorides were in the range of 11 to 14 mg/l, indicating that all samples were meeting the Class 'A' norms as per IS: 2296-1992.
- The total hardness is varying between 80 to 98 mg/l. n which all samples are meeting the Class 'A' norms as per IS: 2296-1992.
- DO for the all the surface water smaples varies between 7.0 to 7.8 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992.
- BOD for the all the surface water smaples varies between 1.9 to 2.5 mg/l which are meeting with Class 'B' norms as per IS: 2296-1992.

Hence, the above analysis result of surface water quality are indicating & meets the Class 'B' norms as per IS: 2296-1992.

11.6.2 AIR ENVIRONMENT

Ambient air quality monitoring was carried out during the study period (March-May 2021) to establish the ambient air quality.

The 98thpercentile of above mention pollutants were assessed and calculated as mention below:

- PM₁₀ value recorded during the study period ranges between 62.27 to 94.81 µg/m³.

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- PM_{2.5} value recorded during the study period ranges between 33.37 to 46.44 µg/m³.
- SO₂ value recorded during the study period ranges between 8.57 to 15.69 µg/m³
- NO₂ value recorded during the study period ranges between 14.47 to 18.63 µg/m³
- NH₃ value recorded during the study period ranges between 39.67 to 60.90 µg/m³
- CO value recorded during the study period ranges between 0.90 to 1.01 mg/m³

From the baseline monitoring result, it is observed that the monitored parameters (PM₁₀, PM_{2.5}, SO₂, NO₂, NH₃, CO) are within the permissible limits as per NAAQS, 2009 during the study period.

11.6.3 NOISE ENVIRONMENT

The day noise levels have been monitored during 6.00 am to 10.00 pm and night noise levels during 10.00 pm to 6.00 am, at all the 8 locations covered in 10 km radius of the study area. The day equivalents during the study period are range between 49.7 to 52.8dB (A), whereas the night equivalents were in the range of 35.7 to 39.0dB (A). From the results it can be seen that the day equivalents and the Night equivalents were within the Ambient Noise standards of residential.

11.6.4 SOIL ENVIRONMENT

The analytical soil samples results collected during the study period is summarized below. The pH of the soil is an important property; plants cannot grow in low and high pH value soils. The normal range of the soils is 6.0 to 8.5 are called as normal to saline in soils. Most of the essential nutrients like N, P, K and Cl are available in plants at the neutral pH except for zinc and manganese which are available at low pH range. The soils having pH below 7 are considered to be acidic from the practical stand point, those with pH less than 5.5 and which respond to limiting may be considered to qualify to be designated as acidic soils. On the basis of pH measurements the degree of soil acidity may be indicated.

- The pH values in the study area are varying from **7.69 to 8.56** indicating that all soils are falling in normal to saline class.
- The electrical conductivity in the study area is varying from **289 to 456 µs/cm** indicating that all samples are falling in normal range.
- The other important parameters for characterization of soil for irrigation are N, P and K are known as primary nutrients and Ca, Mn and S as secondary nutrients. The primary and secondary nutrients are known as major elements. The classification is based on their relative abundance, and not on their relative importance.

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- The available potassium in the study area is varying between **105.7 to 148.3 Kg/Ha** indicating that all samples are falling in medium range except one sample which is falling in Low range.

11.6.5 BIOLOGICAL ENVIRONMENT

The biological study of the area has been conducted in order to understand the ecological status of the existing flora and fauna to generate baseline information and evaluate the probable impacts on the biological environment. There is no national parks wild life sanctuary in the study area. No Threat Species found in the core & buffer zone.

11.6.6 SOCIO- ECONOMIC ENVIRONMENT

Total population of the study area is 125026 persons. Out of which 67554 are male and 57472 are female. In SC category 10271 female to 11639 male and in ST category males are 0 to 0 Female.

Literacy Rate is the amount of people in a country with the ability to read and write. The analysis of the literacy levels is done in the study area. Literacy in any region is key for socio-economic progress and the Indian literacy rate grew to 59.36% in 2011. The study area experiences a considerably average literacy rate of 51.14% (2011).

11.7 ENVIRONMENT MONITORING PLAN

Environmental monitoring program describes the processes and activities that need to take place to characterize and 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. Different activities involved in the proposed project and their impact on various environmental attributes have been taken into account while designing a detailed environmental monitoring program. Environmental monitoring program has been prepared for the proposed project for assessing the efficiency of implementation of Environment Management Plan and to take corrective measures in case of any degradation in the surrounding environment. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project.

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 design of a monitoring program must therefore have regard to the final use of the data before monitoring starts. The monitoring program will have three phases:

- Construction phase

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- Operational Phase

TABLE 11.6 ENVIRONMENTAL MEASURES DURING OPERATION PHASE

S. No	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
	Air Emissions	Stack emissions from Incinerator	Temperature, Pressure, CO, Excess Oxygen, Particulates, HCl, SO ₂ , NO _x ,	Continuous Monitoring
			HF, TOC	Once in Month
			Mercury, Heavy metals, dioxins & furans	Twice in a year
		Stack emissions from DG sets	As per CFE conditions PM, SO ₂ , NO _x	As per CFE conditions
		AAQ within the project premises and adjacent areas (3 places at 120°) to be monitored. All vehicles to be PUC certificate.	As per CFE conditions / NAAQ Standards Vehicle logs to be maintained	As per CFE conditions
		Meteorological data	Wind speed, direction, temp., relative humidity and rainfall.	
2.	Noise	Noise generated from operation of boiler, cooling towers, etc to be monitored	Spot Noise Level recording;	Periodic during operation phase Once in month by third party
3.	Wastewater Discharge (leachate)	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
4.	Solid waste/ Hazardous Waste	Check compliance to HWM rules	Quality & quantity monitoring	Periodically / CPCB norms.
5.	Ground Water Quality	Monitoring ground water quality, around plant site and piezometers	Comprehensive monitoring as per IS 10500 Groundwater level BGL	Periodically & as per CPCB norms.
6.	Flora and fauna	Vegetation, greenbelt / green cover development	No. of plants, species	Once a year
7.	Soil quality	Checking & Maintenance of good soil quality around	Physico-chemical parameters and metals.	Once a year
8.	Health	Employees and migrant labour health	All relevant parameters (BP, Sugar, chest X-ray,	Regular checkups as per

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S. No	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
		check ups	Eye vision, etc.)	factories act.

11.8 RISK ANALYSIS

The principal objective of the risk assessment study is to identify and quantify the major hazards and the risk associated with various operations of the proposed project, which may lead to emergency consequences (disasters) affecting the public safety and health.

All necessary measures to minimize the risk due to the proposed project will be taken during design stage and also during operation period viz. fire & safety control measures, Emergency preparedness plan, disaster management plan, etc.

11.9 PROJECT BENEFITS

From the proposed project the major benefits, include improving the degraded environment by establishing a Common Bio-Medical Waste Management Facilities.

- The proposed project facilitates better management of the Bio-Medical wastes.
 - It will be the showcase for other states for management of Bio-Medical waste with additional benefit of green and clean Environment.
 - It minimizes the pollution load on environment from industrial hazardous waste
 - Compliance with prescribed regulatory norms which in turn avert the risk of closure on account of violation of rules
 - It reduces the number of hazardous Bio-Medical waste dump sites in the area and also eliminates the pollution potential
 - The management of wastes is relatively easier & economically viable at common facility.
 - Cost of environmental monitoring is less at common facility
 - Better occupational health and safety at individual industry level
- Prevention of natural resource contamination thereby improving overall environmental status of the region

11.10. Environment Management Plan

The Environmental Management Plan (EMP) is required to ensure sustainable development in the area of the proposed project site. Hence, it needs proper **Environmental Management Plan (EMP)** to meet these objectives. The purpose of the Environmental Management Plan is to minimize the potential environmental impacts from the project and to mitigate the adverse impacts. Details of Environment Management Plan are given in **Table 10.7**.

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TABLE 11.7 MITIGATION MEASURE PROPOSED DURING OPERATION PERIOD

Air Quality Management	Incinerator will be provided with a stack height meeting MOEFCC. DG set will be provided with a stack height meeting MOEFCC Guidelines or 1 m above the tallest structure in the project area for proper dispersion of sulfur dioxide and oxides of nitrogen. Internal roads will be concreted / asphalted to reduce dust emissions Speed restriction will be followed within the project and speed breakers will be provided at entry and exit points Green belt will be provided along the internal roads and plant boundary.
Odour Control	Dilution of odourant by odour counteraction or neutralize by spraying Ecosorb (organic and biodegradable chemical) around odour generation areas at regular intervals.
	Covering by using heavy duty hessian, plastics and foams odour can be minimized.
Water Quality Mitigation Measures	The domestic wastewater will be collected and treated in septic tank/soak pit or portable STP and reused for greenbelt
	The effluent from floor washings, workshop etc will be collected, treated in ETP(O&G trap, settling tank and recycle back) for dust suppression, etc
	The waste water from bio-medical sections will collected, disinfected
Noise Mitigation Measures	Acoustic Enclosure will be provided for all the high noise generating equipments All the design/installation precautions as specified by the manufacturers with respect to noise control are strictly adhered to Major noise generating sources are insulated adequately by providing suitable enclosures Other than the regular maintenance of the various equipment, ear plugs are provided to the personnel close to the noise generating units; All the openings like covers, partitions are designed properly.
Solid Waste Mitigation Measures	The ash coming from incineration plant area will be sent to nearest TSDF site
	The sludge generated in the ETP will be sent to Nearest TSDF site

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Occupational Health & Safety	Periodic health checkup for early detection and control of communicable diseases
	Will provide preventive measures for potential fire hazards with requisite fire detection, firefighting facilities and adequate water storage, etc.
	Provide regular training for workers in their respective fields

11.11. Conclusion

M/s. Indo Tech Waste Solution has committed to implement all the pollution control measures to protect the surrounding environment. The project can definitely improve the regional and state level environment and reduce health hazards. The present project at Kumraua village will cater 10,000 beds per day and will cover 75 Km or more if required as per authority requirements. The Proposed Project will collect all the biomedical waste from all varieties of hospitals including PHC, Nursing Homes, Clinics, Pathological Labs etc., Presently there is no BMW facility under 75Km and the waste generated from all these district areas are unscientifically disposing the waste and posing a way health hazard in surrounding areas. Projects like this will certainly improve the living standard of local people. The implementation of this project will definitely improve the physical and social infrastructure of the surrounding area.

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CHAPTER-XII

DISCLOSURE OF

CONSULTANT

Project Name	Proposed Common Bio-medical Waste Treatment Facility at Vill. -Kumraua, Dist.- Kasganj, U.P
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CHAPTER – XII**DISCLOSURE OF CONSULTANT**

Wolkem India Limited (Consultancy Division) is accredited by QCI/NABET having certification number **NABET/EIA/2124/RA 0216, Valid upto - Feb 05, 2024**. WIL laboratory is well equipped quality lab having sophisticated equipment's. It is accredited by NABL Certificate No. TC-5941, Issue date 26/12/2019, Validity- 25.12.2021) and recognized by MoEF &CC.

Declaration by Experts contributing to the EIA/EMP of Proposed Common Bio-medical Waste Treatment Facility at Village- Kumraua, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh - Sector – 32A and 7(da) Common Bio-medical Waste Treatment Facility (CBWTF), **Category –B**.

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

EIA coordinator

Name: Ankit Badwaik (Left the Organization)

Period of involvement: February 2021 till January 2022

Contact information: 7032906776

Associate EIA coordinator

Name: Vikrant Mahendran

Signature:

Period of involvement: August 2021 till date

Contact information: 7737716644

Functional Area Experts (FAE):

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature
1	AP	Mr. Mohit Rawat	- Micro Meteorology, establishment of air pollution monitoring network also quality check. - Impact assessment, mitigation & environmental management plan preparation	

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2	WP*	Dr. RatnaKumar Mudliar Ms. Bhanushri Paneri	• Water Quality monitoring network designing. • Sampling of water samples (surface and ground water). • Monitoring of water quality. • Water Balance • Identification & assessment of quantum of water pollution and its Mitigation measures. • Waste water treatment Suggestion	 
3	SW	Mr. Mohit Rawat	• Identification of hazardous and non-hazardous wastes. • Reuse and recycling of solid wastes. • Handling and disposal of solid waste and C&D waste.	
4	BMW	Mr. Ankit Badwaik	• Identification of hazardous and non-hazardous wastes. • Reuse and recycling of solid wastes. • Handling, Storage and Disposal of waste.	
5	HW	Mr. Mohit Rawat	• Identification of hazardous and non-hazardous wastes. • Reuse and recycling of solid wastes. • Handling, Storage and Disposal of waste.	
5	SE*	Mr. Narendra Chundawat TM- Panna Lal*	• Baseline socio economic survey (Interviews, Questionnaires, focused group discussion) • Evaluation of Socio economic development status of the area. • Enterprise social commitment provisions.	 
6	EB	Mr. Mahip Kapoor	• Conducted Ecological survey & preparation of status report. • Application of taxonomy in resource inventory (Flora &	

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			Fauna) - List of species animals and plants report. - Identification & assessment of ecological impact due to proposed project and its Mitigation measures.	
7	HG	Mr. Vikrant Mahendran	- Description and assessment of Hydrogeology and impact evaluation - Mitigation measures and remediation plan	
8	GEO	Mr. Manoj Bhatnagar	- Description and assessment of Geology and impact evaluation - Mitigation measures and remediation plan	
9	SC	Dr. RatnaKumar Mudliar	- Soil Quality monitoring network designing. - Sampling of soil samples (surface and ground water). - Monitoring of soil quality. - Identification & assessment of quantum of soil pollution and its Mitigation measures.	
10	AQ*	Mr. K.V Ramesh TM-Mohit Rawat	- Analysis of collected baseline data. - Processing of micrometeorological data for using in model. - Analysis of predicted impact due to the modelling result.	 
11	RH	Dr. RatnaKumar Mudliar	- Identification of hazards due to proposed project. - Analysis and Mitigation of project risk. - Preparation of risk assessment report and onsite emergency plan.	
12	NV	Mr. Prakash Mal Jain	- Analysis of collected baseline data. - Processing of data for modeling purposed. - Analysis of predicted impact	

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			due to the modeling result.	
13	LU	Mr. Vikrant Mahendran	Development of land use maps of study area using GIS / related tools, site visit for ground truth survey, finalization of land use maps.	
Other Expert				
Draughtsman		Mr. Bhupendra Jhalora		
Software & other facilities available –Autocad , Civil 3 D, Aermod software, dhvani PRO software, GIS , Plotter				

*One TM/FAA against each FAE may be shown

**Please attach additional sheet if required

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

I Vikrant Mahendran hereby, confirm that the above mentioned experts prepared the EIA for Proposed Common Bio-medical Waste Treatment Facility at Village- Kumraua, Block- Soron, Tehsil & District- Kasganj, Uttar Pradesh - Sector – 32A and 7(da) Common Bio-medical Waste Treatment Facility. 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: Mr. Vikrant Mahendran

Designation: Chief Manager

Name of the EIA consultant organization: Wolkem India Limited

NABET Certificate No. & Issue Date: NABET/EIA/2124/RA 0216 , VALID UPTO - FEB 05, 2024.