

**BEFORE THE NATIONAL GREEN TRIBUNAL, PRINCIPAL
BENCH, NEW DELHI**

**M.A. 106/2023
IN
Original Application No. 694/2022**

Bhupinder SinghApplicant
Versus

Govt. Of NCT of Delhi &Ors.Respondents

Next Date of Hearing : **15.03.2024**

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Counsel for Respondent No.4
Manreet Kaur, Nitesh, Nitu Sharma

Date:09.02.2024
Place: New Delhi

**Before The National Green Tribunal, Principal Bench, New
Delhi**

**M.A. 106/2023
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Govt. Of NCT of Delhi &Ors.Respondents

Next Date of Hearing : **15.03.2024**

**Reply on behalf of the Respondent No.4 namely M/s Xaper
Waste Solutions Pvt. Ltd.**

1. That the above-mentioned case is pending before this Hon'ble Tribunal and fixed for further consideration on next date of hearing i.e. 15.03.2024. as per the last order dated 12.12.2023 of this Hon'ble Tribunal respondent no.4 was directed to file reply within two months from the last order.

Preliminary Submissions :-

1. That Respondent No.4/ XAPER Waste Solutions Pvt. Ltd is technology driven startup promoted by an environment concerned Ajay Palta worked passionately for effective solution for waste whether it is Municipal Solid Waste (MSW) in our cities

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or Agro-waste (Paralietc) in rural India. Every kind of waste has a certain value, lacking appropriate technologies most of wealth in waste is wasted. **E3** is the mantra for sustainable development that renewable **Energy** from waste is pivotal for sustainable **Economy** and balanced **Environment**. The lack of segregation, land constraints, appropriate waste processing technology remains the major hindrance in waste disposal. Most of local bodies are following age old practice of waste collection, transportation and dumping of waste. Waste collection points (Dhallaos) remains sour points of cities and garbage collected from cities add up waste in overflowed dumping grounds.

2. That after thorough analysis Respondent No.4 developed Technology for decentralized waste sorting and processing of municipal solid waste applied for its patent in 2016. The copy of the complete specification of the Patent Rules of Respondent no.4 vide dated 22.10.2016 is annexed herewith as **Annexure - 1**.
3. That Respondent no.4 got its patent in 2020. The copy of the Certificate of Patent vide dated 02.09.2020 is annexed herewith as **Annexure -2**.

4. That in July 2019, NITI Aayog put up Atal New India Challenge (ANIC) grant in aid support to seek, select, support and nurture technology based that solve sectoral challenges of national importance and societal relevance. Respondent No.4 won the challenge in decentralized waste processing category. The copy of the ANIC grant in aid support of Respondent no.4 is annexed herewith as Annexure **Annexure- 3**.

5. That In July 2019 The Office of Principal Scientific Adviser (PSA) to the Government of India under the aegis of Prime Minister – Science, Technology and Innovation Advisory Council (PM-STIAC) has identified "Waste to Wealth" mission with the aim to identify, develop and deploy technologies to treat waste. As Waste treatment and management is the highest priority of the Government of India O/o Principal Scientific Adviser (PSA) to Government of India in partnership with East Delhi Municipal Corporation (EDMC) invites proposals from technology partners issues a Global RFP to select technologies for 100% diversion of municipal waste from landfill. Prime purpose of RFP was to select appropriate technology for Management and treatment of daily generated 2200 tons of municipal solid waste in East Delhi. It

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was mentioned in RFP that "These solutions should be demonstration of implementation, validation and efficacy of technology to bring about amelioration of the waste Segregation of fresh waste at source and complete utilization and recycling to avoid addition of waste to the Ghazipur Dump Site. Support may be considered for scale up of successfully demonstrated technologies based on the merit and socio-economic impact of the technology." The true copy of the India's waste to wealth mission global request for proposals is annexed herewith as **Annexure-4.**

6. That respondent no.4 selected among world technologies to demonstrate technology. For the purpose 2 machines of 10 TPD mixed waste capacity installed at Jafrabad Dhallao and Kasturba Drain Dhallao in East Delhi. The true copy of the sanction letter by Office of the Principal Scientific Adviser vide dated 13.04.2020 is annexed herewith as **Annexure-5.** During its operation Respondent no.4 processed 2782 tons of waste and diverted it from Ghazipur Land fill . The true copy of the summary of performance data of the respondent no.4 at Kasturba Drain Dhallao from 14/05/2020 to 05/01/2022 and Summary of performance Data of Respondent no.4 at Jafrabad Techpark from

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18/01/2022 to 31/03/2023 is annexed herewith as **Annexure-6.**

7. That the Office of PSA along with Waste to Wealth mission and Invest India form a committee of eminent experts from premier institutes of India for techno commercial evaluation of technology. Expert committee after detail analysis of technology submitted techno commercial analysis and it was observed that conventional waste processing incurred huge cost to exchequer whereas there is substantial saving in collection, transportation & dumping cost to local bodies along with environmental impacts. Decentralized processing technology by Respondent no.4 played such a crucial role in waste to wealth mission that leads to the huge savings for local bodies while eliminating dhallos divert 100% waste from landfills. The true copy of the techno feasibility report for the project titled as Diversion of fresh Municipal Waste from the Landfill is annexed herewith as **Annexure-7.** Then, in 20th February 2023, Office of the Principal Scientific Adviser to Govt of India validated the technology of Respondent No.4. The true copy of the letter of the Office of the Principal Scientific Adviser dated 20th Feb 2023 annexed herewith as **Annexure -8.**

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8. That, it is really surprising waste processing data generated by the respondent no.4 which is totally ignored by the other respondents. Till date about 10000 tons of waste has been processed and diverted from landfills through different installations of XAPER technology. The chart of the waste processing data managed by the Respondent no.4 is annexed herewith as **Annexure- 9**.

Reply On Merits :

1. That the initiative of Respondent no. 4's machine was initially installed in SBS Nagar Nawasahar, Punjab. To test the technology, a proposal of 10 TPD capacity was send to Respondent Delhi cantonment board in May 2018. Machine of 10 TPD installed at Kirby Place Delhi cantonment on 'no cost no commitment' basis in order to check the techno-commercial viability of the respondent no.4's technology. The true copy of the proposal letter for installation of respondent no.4's technology dated 25.07.2018 is annexed herewith as **Annexure-10**. Respondent no.4's technology Machine processed 277.5 tons of MSW during trial period and proved its worthiness by reducing waste quantum by more than 75%. The

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true copy of the summary of performance data from Respondent no.4 is annexed herewith as **Annexure-11**.

2. That In order to evaluate the techno-commercial viability of respondent no.4, the respondent no.3/DCB constituted a validation committee. The true copy of the validation of Sorting-Cum-Composting by the respondent no.3 of dated 02.01.2019 is annexed herewith as **Annexure-12**. The Report submitted by the validation committee strongly recommends installation of Respondent No.4's machines to process and divert 100% waste generated in Delhi Cantonment and substantial savings to Delhi cantonment by waste processing. The copy of the report of the validation committee by the respondent no.3 in the favour of the respondent no.4 is annexed herewith as **Annexure-13**. Respondent no.3/DCB had never taken any action on report as none of official was interested in waste management after number of futile requests of respondent no.4 for decision, ultimately respondent no. 4 was helpless even though after such a great initiative work for Delhi society and respondent no.3 .Respondent no.3 did not considered the initiatives, substantive savings and many more benefits from machines, ultimately respondent no.4 take away machine on its own cost from

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Respondent no.3/ Delhi Cantonment Board.

3. That on selection of technology by PSA, respondent no.3 renewed its interest in technology and asked respondent no.4 to submit a new proposal. On 2/2/2021 and 15/6/2021 respondent no.4 submitted proposals to respondent no.3 for Zero-waste Delhi Cantonment and clearly mentioned that 4 modules of 20 TPD capacities are required to process entire 70 tons of waste generated in Delhi Cantonment. The true copy of the emails is annexed herewith as **Annexure-14**.
4. That On 12/09/2021, Respondent No.3/DCB approved circular agenda "**Procurement of XAPER machines for decentralized processing of Solid Waste to achieve 'Zero Waste' scenario in Delhi Cantonment**". In agenda comparisons made within existing technologies, advantages and savings to Respondent No.3/DCB by technology are mentioned in agenda further it was assessed that Xaper is only solution for compliance of NGT orders and SWM rules 2016. The true copy of the Circular Agenda is annexed herewith as **Annexure-15**.
5. That respondent no.3/ DCB purchased only one sorting cum composting machine of capacity 20TPD Machine for INR

orders for additional three machines. Respondent no.4 was well aware of conduct of respondent no.3/ DCB's working culture and respondent no.4 had shared their apprehensions with respondent no.2 /CEO Delhi Cantonment. The true copy of the emails regarding apprehensions written by the respondent no.4 is annexed herewith as **Annexure-18**.

8. That in February 2021, the Initial trials of respondent no.4's machine were executed and then by June 2022 machine was ready for working at optimum processing capacity.
9. That respondent no.4's technological machine had processed 1668.2 tons of waste for which respondent no.3/DCB paid the company Rs.791701/- (Rs. 4,56,135/- on 19/01/2023 & Rs. 3,35,566/- on 14/2/2023) which comes to Rs.474/- per ton for processing, transportation and disposal. it is persistent to mention that respondent no.3 /DCB deducted an amount of Rs.3,08,796/- as disposal cost for 40 tons of RDF that comes to Rs. 7720/- per ton that is about 15 times more of rate fixed with company. The true copy of the summary of the waste processing data of the Respondent no.4's technological machine is annexed herewith as **Annexure-19**.

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2,20,42,726/- through GeM portal and machine was installed at designated site at Tigris Road, Sadar Bazaar, Delhi Cantonment. The true copy of the Government E Market Place is annexed herewith as **Annexure-16**.

A contract for operation, transportation and disposal of 20 tons/day fresh municipal waste for a period of 1 year was signed on 24/01/2022. The true copy of the agreement dated Jan 2022 between respondent no.3 and Respondent no.4 is annexed herewith as **Annexure-17**.

6. That As per agreement Respondent No.3 agrees to pay Rs.595/ton for processing 6000 tons of waste annually bifurcated as :-

Manpower cost	Rs.20,26,216
Disposal cost	Rs.15,44,400

7. That respondent no.4 has taken the project as a gesture of goodwill as it takes the project as an opportunity to demonstrate its Zero waste concept in a small area in DELHI. Further it was assured that Respondent no.3 will provide all possible support to make project a success to Respondent no.4. It was assured that Respondent no.3 will get its personals trained and take up operation on its own and company will have

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10. That at these rates and terms it was not possible for Respondent No.4 to operate, maintain, transport and disposal of waste so company requested respondent no.3/DCB to modify the contract and enhance the rates for sustainability of operation further it was requested by the respondent no.4 that respondent no.3/DCB should install 3 additional modules to process 70 tons of waste generated in Delhi Cantonment for un-interrupted processing of daily generated waste in the area. But then there was no response from the respondents. There was totally silence from the respondents. The true copy of the mails and letters for the revised rates is annexed herewith as **Annexure-20**.
11. That as per the order passed by this Hon'ble tribunal, a Committee comprising concerned District Magistrate and DPCC constituted to verify factual position. The Committee inspected the waste processing site on 11/11/2022 and on the base of its findings a show cause notice was issued to Respondent No.4 and Respondent no.3. The show cause notice was issued with direction to respondents no.3 and 4 to shift waste processing facility from its present location to some other location within 4 months i.e. 31st march 2023 and prior Consent to Establish

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before shifting and consent to operate before starting the operation. The true copy of the show cause notice is annexed herewith as **Annexure-21**.

12. That it is pertinent to mention herein that it was clearly mentioned in the directions issued in the show cause notice that Respondent no.3 shall obtain prior consent to establish before shifting and establishing the above-mentioned facility for the new location. As DPCC observed that waste processing site at Sadar Bazaar is unauthorized so it is not possible to consent for the same at existing site. But on 07/12.2022 respondent no.3 issued show cause notice to respondent no.4. and then on 03/03/2023 another show cause was issued in continuation directing Respondent no.4. to take Consent to operate at for existing unauthorized site at sadar bazaar. The true copies of the show cause notices dated 07.12.2022 and 03.03.2023 respectively is annexed herewith as **Annexure- 22**.
13. That on insistence of respondent no.3 respondent no.4 has applied for consent to operate at existing site at Sadar Bazaar but DPCC/Respondent No. 1 altogether denied any possibility of consent at existing site and directed respondent no.4 to apply consent to establish for the new site.

14. That as per resolution order from DPCC and this Hon'ble Tribunal the machine was to be relocated to Kirby place along with three additional machines for addressing the 70 tons of daily waste generation in Delhi Cantonment and DPCC agrees to give consent at new site.
15. That Respondent No.1/ DPCC has vide notice dated 30.11.2022 directed the Delhi Cantonment Board to shift the facility to some other location/Kirby Place (site already identified) within four months by 31.03.2023 but DCB approached NGT has sought eight months' time for shifting the facility and submitted that the facility will be shifted by 30.09.2023. Accepting DCB request, this Hon'ble Tribunal extended the deadline to 30.09.2023.
16. That it is really surprising and sad to see respondent no.3/DCB neither shown any interest or action to relocate the machine at new site in ten months period (Nov 22 to Sept-23) not a single action was taken in the direction, neither given respondent no.4 required allocation or laid a brick for construction on proposed site nor order additional three machines to respondent no.4 to process and divert all the 70 tons of waste generated in Delhi Cantonment area. Just few days before the deadline respondent

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no.3 black listed respondent no.4 and imposed a penalty of Rs. Rs.1,45,98,930/- and issued a letter no.DCB/IT/Misc /2022 dt.14/09/2023 in this regard to respondent no.4. Respondent no.3 played very strategically to divert the attention of this Hon'ble Tribunal from the main issue. The true copy of the letter dated 14.09.2023 by respondent no. 3 of blacklisting the respondent no.4 annexed herewith as **Annexure- 23. The main reason for black listing was failure to take consent to operate from Respondent No.1/DPCC at existing Sadar Bazaar site.** Respondent no.3 just for justification tried to shift the burden on the respondent no.4 and issued show cause notice and imposed the huge penalty against respondent no.4 as "Scapegoat".

17. That it was mentioned in the letter that respondent no.3/DCB is incurring cost of Rs. 2955/ton for processing of waste and Rs.1460/ton for disposal (Rs.7300 for 5 m MT) that DCB incurring a cost of Rs.4415(Rs.2955 + Rs. 1460) as against agreement of Rs. 595/- with Respondent no.4 and is incurring huge losses due to nonfunctioning of machine so respondent no.4 is liable to pay losses incurred by respondent no.4 due to non-operation of machine and a hefty penalty of Rs.

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1,45,98,930/- imposed on the respondent no.4 for an operation contract of Rs.35,70,616/-.

18. That respondent no.4 requested in their letters addressed to respondent no.3/ DCB to settle the issue at the earliest and resume the operation of the machine else get their personals trained for the operation. But till date there is no further reply.
19. That in the 10 months period from the date DPCC issued instructions (30/11/2022) to deadline (30/09/2023) fixed by NGT Delhi cantonment has failed to take a single step in the direction and used the company as scapegoat to cover up for all their shortcomings and diverting tribunal attention from prime issue.
20. That bases of penalty by respondent no.3/DCB was that respondent no.3/DCB incurring cost of Rs. 4415/- to transport unsegregated waste to dump at Okhla but never taken the offer of Rs. 1455/ ton of tipping fees. Even at proposed rate respondent no.3/DCB may have saving of Rs.2960/ton that comes to more than Rs.7 crore in a year for processing 70 TPD waste. Respondent no.3 is totally ignoring such a beneficial fact

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of the respondent no.4's technology.

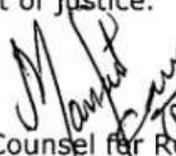
21. That it is pertinent to mention that While processing by respondent no.4's technology there will not be any leachate generation, waste reduction of more than 70%, and 100 % diversion of solid waste from landfill, compost for green belts in Delhi cantonment , energy recovery from leftover by cement plants or else but DCB prefer to go with age old practice of collecting transporting and dumping of waste incurring much higher costs.
22. That the blacklisting and penalty imposed on respondent no.4 by the respondent no.3 is baseless as respondent no.3 is failed to abide by the resolutions ordered dated 23.02.2023 by this Hon'ble Tribunal and in spite of getting and extension of 6 months no actions and steps for public benefit were taken by the respondent no.3 and putting their responsibilities on respondent no.4 for their shortcomings and unwillingness to abide the order passed by this Hon'ble Tribunal. Blacklisting restricts respondent no.4 to put technology in any other place.
23. That respondent no.4's technology is very effective and giving a very substantive outputs and benefits to the society. It plays

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important functioning in the society and same has been reported by Office of the PSA to Government of India and reports submitted by the respondent no.3 even the base of penalty imposed was the savings by operation of machine.

It is, therefore, Most respectfully prayed that this Hon'ble Tribunal may be pleased to;

- (a) Pass the direction to the Respondent no.3 for installation of the additional machines of technology by Respondent no.4 at the new site to make zero waste Delhi cantonment.
- (b) Remove the Backlisting and Penalty imposed on Respondent no.4.
- © Pass any further order, direction as this Hon'ble Tribunal thinks fit in the interest of justice.


Counsel for Respondent No.4

Manreet Kaur, Nitesh, Nitu Sharma

Date: 09.02.2024

Place: New Delhi

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BENCH, NEW DELHI**

**M.A. 106/2023
IN
Original Application No. 694/2022**

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AFFIDAVIT

I, Ajay Palta son of Narender Palta aged about 56 years Director, XAPER Waste Solutions Pvt. Ltd at Sodal-Saipur Road, Jalandhar, Punjab-144004 at present at Delhi do hereby solemnly affirm and say as follows:

1. I say that I am Director of Respondent No.4/ XAPER Waste Solutions Pvt. Ltd in the above case, and I am well conversant with the facts and circumstances of the case as such I am competent swear this affidavit.
2. I say that the statements of facts stated in the Reply of respondent No.4 are true and correct as per records of the case and belief.



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3. That the annexures annexed to the Reply are true copies of their respective originals.

[Handwritten Signature]
DEPONENT

VERIFICATION:

Verified at New Delhi on this 06th day of February, 2024 that the contents of above affidavit are true and correct to the best of my knowledge and no part of it is false and nothing material has been concealed therefrom.

IDENTIFIED BY *[Handwritten Signature]*
[Handwritten Signature] 21/11/2023
NOTARY
Name: R.P. Bansal
Area: New Delhi
Regd. No.: 10678/14
Expiry Date: 28/06/2024
GOVT. OF INDIA

[Handwritten Signature]
DEPONENT

ATTESTED
[Handwritten Signature]
Notary Public, Delhi
(As Presented)
[Handwritten Signature] 06/02/2024

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<p style="text-align: center;">FORM 2 THE PATENTS ACT, 1970 (39 of 1970) & The Patents Rules, 2003 COMPLETE SPECIFICATION [See section 10 and rule 13]</p>
<p style="text-align: center;">TITLE OF THE INVENTION: INTEGRATED APPARATUS FOR SEPARATING AND PROCESSING OF MUNICIPAL SOLID WASTE</p>
<p>1. APPLICANT</p> <p>(a) NAME - Palta Engineering Works Pvt. Ltd.</p> <p>(b) NATIONALITY - India</p> <p>(c) ADDRESS - c-21, focal point, Jalandhar, India</p>
<p>PREAMBLE TO THE DESCRIPTION</p> <p>The following specification particularly describes the invention and the manner in which it is to be performed</p>

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INTEGRATED APPARATUS FOR SEPARATING AND PROCESSING OF MUNICIPAL SOLID WASTE

FIELD OF THE INVENTION

[0001] The field of the present invention relates an apparatus for separating wet organic waste and dry fraction of mixed municipal solid waste and processing of organic waste for producing odor free uniform compostable product. More specifically, the present invention provides an integrated apparatus for separating and processing of mixed municipal solid waste.

BACKGROUND OF THE INVENTION

[0002] The population of the world is increasing at a rapid rate and the number of people migrating to small and big cities has further increased in recent years. This may be due to higher comfort and earning opportunities.

[0003] It is worth noting that millions of tons of waste are generated every year from these small and big cities. The disposal of waste is a big problem. For example, it is estimated that 380 million Indians living in 6000 small or big cities generate about 200,000 tons of waste every day and urban population of India generates about 70 million tons of waste every year. It is estimated that waste generation by urban India shall grow more than five times to 370 million tons by 2030.

[0004] It is further observed that significantly less percentage of generated waste is collected and very small portion of collected waste undergoes processing. Irrational conventional open dumping continues to be prevalent mode of disposal and sanitary landfills are yet to be maintained. The cities resort to indiscriminate dumping of domestic, commercial, industrial and medical wastes in low lying areas. This leads to contamination of surface and ground water by the leachate and contamination of air greenhouse gases which get generated by decaying waste. There is requirement of 1240 hectares of additional dumping land every year for such unhygienic waste handling.

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[0005] Open storage and dumping creates unhygienic condition in and around urban areas. The unsightly condition in and around the cities also poses serious threat to health and well-being of people residing in the cities.

[0006] Open waste collection centers on road sides attract rats, cows, pigs, street dogs and number of insects like house fly, cockroaches and mosquitoes. WHO concluded that these Municipal Solid Waste (MSW) fed rodents spread 22 types of serious diseases.

[0007] Managing municipal solid waste is one of the most essential services which often fail due to rapid urbanization along with changes in the waste quantity and composition. New products wrapped with new packaging materials, new living standards, change in income and affluent people life style has increased the waste quantity. Average waste generation by affluent people is ten times more than poor's.

[0008] Adding to complexity of waste disposal, mixed waste from homes and streets store up in street bins, *dhalaos* or open site because door to door collection and segregation at source is not yet functional at an optimal level. Moreover, rag pickers, who pick up recyclables from waste in many areas of the country, are considered as blot on society because rag pickers make storage site uglier by scattering waste, while taking out valuables. Accordingly, a social stigma is attached to the waste collection process. To add to that rag pickers, despite their hard work, are unable to thoroughly recover plastic, paper, metal, glass, e-waste and other materials having commercial value because non-degradable waste intermingle with degradable waste making recovery impossible.

[0009] To add to the problems, openly scattered waste produce foul smell and unsightly images because open anaerobic (in absence of oxygen) degradation of moisture rich organic food waste generate foul smell. It is well known that garbage affects public health because rodents and bugs attracted toward organic food waste and spread diseases.

[0010] In the country, municipal authorities often fail in their prime duty of solid waste management because they are unable to make pace with rapid urbanization and new living standards results in growing waste quantity.

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[0011] Accordingly, waste from storage sites are transported to far away dumping sites or centralized waste processing facilities because municipal bodies don't have appropriate technologies to process un-segregated waste at decentralized locations(waste storage sites or transport stations).It is estimated that 90% of the collected waste is dumped in landfills because of inefficient recyclable extraction, non-processing of biodegradable waste and non-utilizations of combustible waste. Most of landfills in India are working over capacity because it is difficult to have additional landfill sites due to nimby(not in my back yard) syndrome.

[0012] Indiscriminate land filling of biodegradable waste pollutes our land, water and air. Recyclables and fuels are resources, dumping valuables in landfills by no mean an intelligent effort but authorities are unable to maintain sanitary landfills till waste is processed.

[0013] The waste processing plants are not working well because Compost plants are not getting segregated biodegradable wastes and incarnation plants faces public resistances due to pollution issues.

[0014] Considering the above problems, there is a need to design various apparatuses for sorting and processing of the waste. There is an imperative need of designing apparatuses for biological decomposition or degradation of the waste. Especially, there is a need to develop apparatus which is integrated and can easily be placed in the urban landscape in a decentralized manner. Such apparatus should be modular, easy to operate, transportable, lower operational cost and easy to install at limited small area.

SUMMARY OF THE INVENTION

[0015] The general purpose of the present invention is to provide an integrated apparatus for separating and processing the solid waste to produce recyclables, Refuse Drive Fuel (hereinafter referred as "RDF") and an odor free uniform product (Compost). The apparatus can be placed in decentralized locations in modular manner.

[0016] The apparatus includes a rotary cylindrical drum capable of being rotated by electro-mechanical energy. Further, the apparatus includes two rotary

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cylindrical screens. The inner rotary cylindrical screen is mounted within the rotary cylindrical drum and outer rotary cylindrical screen being connected with the rotary cylindrical drum at a discharge opening of the rotary cylindrical drum. Further, both the rotary cylindrical screens comprise a plurality of sieves capable of separating the solid waste based upon the variable sizes. Furthermore, inner rotary screen is capable of segregating raw mixed municipal waste fed in the apparatus while waste larger than sieve sizes passes through discharge end and waste smaller than sieve size settled in rotary cylindrical drum.

[0017] In the integrated apparatus, rotary cylindrical drum work as bio decomposing section. An aerobic culture of micro-organisms is added for fermentation and decomposing of settled separated organic solid waste in the decomposing section that is the rotary cylindrical drum, wherein the fermenting and decomposing of the separated solid waste produces an odor free product(Compost), thereby providing an integrated apparatus.

[0018] In an embodiment of the present invention, the fermenting and decomposing of the organic solid waste in aerobic conditions results in drying of the said organic solid waste by heat generated during the fermenting and decomposing of the said waste by the culture of micro-organisms.

[0019] In an embodiment of the present invention, the rotary cylindrical drum and the inner and outer rotary cylindrical screens rotate simultaneously by a rotating assembly, wherein the rotation of the rotary cylindrical drum results in faster microbial activity due to tumbling of the organic solid waste.

[0020] In an embodiment of the present invention, outer rotary cylindrical screen is provided on discharge of rotary cylindrical drum, this outer rotary cylindrical screen is capable of segregating processed odor free product coming out of rotary cylindrical drum.

[0021] In an embodiment of the present invention, the apparatus further comprises a rugged stand adapted to support the cylindrical drum, the stand having a plurality of legs for supporting the said rotary cylindrical drum. The legs provide an inclination to the said supported rotary cylindrical drum at the discharge opening. The

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said inclination allows the waste to slide through the discharge opening by force of gravity.

[0022] This together with the other aspects of the present invention along with the various features of novelty that characterized the present invention is pointed out with particularity in claims annexed hereto and forms a part of the present invention. For better understanding of the present invention, its operating advantages, and the specified objective attained by its uses, reference should be made to the accompanying descriptive matter in which there are illustrated exemplary embodiments of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The advantages and features of the present invention will become better understood with reference to the following detailed description and claims taken in conjunction with the accompanying drawing, in which:

[0024] Fig. 1 illustrates a perspective view of the integrated apparatus, according to various embodiments of the present invention;

[0025] Fig. 2 illustrates a side view of the integrated apparatus for separating and processing municipal solid waste, according to various embodiments of the present invention;

[0026] Fig. 3 illustrates a discharge end view of the integrated apparatus, according to various embodiments of the present invention;

[0027] Fig. 4 illustrates a top view of the integrated apparatus, according to various embodiments of the present invention, and

[0028] Fig. 5 illustrates a cross sectional view of the integrated apparatus across line AA as shown in Fig. 4, according to various embodiments of the present invention.

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[0029] Like numerals refer to like elements throughout the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0030] The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The exemplary embodiment was chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated.

[0031] The terms “a” and “an” herein do not denote a limitation of quantity, but rather denote the presence of at least one of the referenced item.

[0032] The terms “having”, “comprising”, “including”, and variations thereof signify the presence of a component.

[0033] The present invention relates to an integrated apparatus for separating wet organic waste from dry and further processing of wet organic waste to produce an odor free compostable product. The integrated apparatus is designed and invented to separate mixed municipal solid wastes of variable types and variable sizes and process the separated organic solid wastes by microbial activity. The said integrated apparatus shall now be explained in detail in conjunction with Figs. 1-5.

[0034] Referring to Fig. 1, there is shown a perspective view of the integrated apparatus 100 for separating and processing of municipal solid waste.

[0035] The term ‘waste’ as used throughout the description refers to municipal waste, mainly including food waste from kitchen waste (50%) mixed with plastic, paper, cloth, glass, metals, dust, construction waste etc.

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[0036] The terms “integrated apparatus” and “apparatus” are being used interchangeably throughout the description of the present invention.

[0037] It will be obvious to a person skilled in the art that the Municipal solid wastes may belong to any category such as -

1. Biodegradable waste: moisture rich food, kitchen and horticulture waste (vegetables, flowers, leaves, fruits, food residues).
2. Recyclable material: paper, glass, bottles, cans, metals, certain plastics, etc.
3. Inert waste: construction and demolition waste, dirt, rocks, debris, and the like.
4. Combustible wastes: waste clothing, Tetra Packs, waste plastics, and the like.
5. Domestic hazardous waste: medication, e-waste, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer and pesticide containers, batteries, shoe polish etc.

[0038] However, the present invention should not be construed to be only limited to municipal waste, and could be used for size separating and processing of organic content of any solid waste, domestic or industrial.

[0039] In the said view, there is shown a rotary cylindrical drum 110 (hereinafter referred as “drum 110”) placed on a rugged stand 135. The rugged stand 135 comprises a plurality of legs 130 for supporting the integrated apparatus 100. The function of the rugged stand 135 is to provide a support to the apparatus 100 and particularly drum 110.

[0040] In one embodiment of the present invention, in the said rugged stand 135 there are provided a plurality of tyres 125 for rotating the apparatus 100 and particularly drum 110. This plurality of tyres 125 is mechanically powered (not shown in the figure) for rotating the apparatus 100. Heights of legs 130 are designed in a manner to provide an inclination necessary for allowing the waste to slope through the drum 110 during processing of said waste.

[0041] The integrated apparatus 100 is positioned in an inclined position “I” which is shown in Fig. 2 and will be explained later.

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[0042] An inner rotary cylindrical screen 105 (hereinafter referred as “inner screen 105”) is mounted within the drum 110. This inner screen 105 is adapted to receive municipal solid waste from feed end 107 whereas it discharges the larger waste (which could not be sieved through the sieves of the inner screen 105) from the discharge opening 115 at the other end 108 (refer Fig. 2).

[0043] In the said apparatus 100, there is also provided an outer cylindrical screen 145 (hereinafter referred as “outer screen 145”) which further consists of sieves for separating the odor free product generated after processing from the drum 110.

[0044] In one embodiment, the outer screen 145 is attached with the drum 110 towards the discharge opening 115 as shown in the Fig. 1. In another embodiment, the screen 145 has an abutting length greater than the drum 110 for providing an elongated discharge opening.

[0045] In an embodiment, the inner screen 105 is a trommel screen having a plurality of sieves 140 (refer Fig. 5) for separating the solid waste and collecting the separated solid waste into the drum 110. Similarly, the outer screen 145 also comprises sieves for separating the processed odor free product generated in the drum 110 for further segregation and usage.

[0046] More particularly, the solid waste passing through the sieves 140 of the inner screen 105 are generally organic in nature and are biodegradable waste. These separated solid waste flow through the trommel screen as it rotates, and percolates into the drum 110 to collect therein. The collected waste is layered in such a manner that they don't overflow through the inner screen 105. This means that there always remains a gap between the upper layer of the waste collected in the drum 110 and the inner screen 105 so that the separated waste lying in the drum 110 does not return to the inner screen 105.

[0047] In the inner walls of the said drum 110, there is provided internal blades (not shown) extending from the inner walls of the said drum 110. These internal blades are responsible for lifting the solid waste when they fall back to the base by gravity.

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[0048] In an embodiment, the drum 110 and the inner screen 105 are subjected to constant rotation simultaneously. Such constant rotation, lifting and falling of waste in the drum 110, results into breaking, mixing and homogenizing organic wastes. Dense, abrasive items in waste such as glass or metal help in accelerating the breakdown of softer materials, resulting in considerable size reduction of biodegradable materials.

[0049] In the inner screen 105, sieves 140 of sizes 100 mm are provided. At the very beginning, when solid waste enters into the inner screen 105 via a belt conveyor (not shown), the waste smaller than 100mm size are dropped via the sieves 140 and waste larger than 100 mm get discharged through the discharge opening 115.

[0050] In an embodiment of the present invention, the organic waste which is bio dried and shredded in rotary cylindrical drum 110, are discharged through slits 150 provided at the discharge end of rotary cylindrical drum 110. Processed waste coming out of slits 150 falls on outer screen 145 for further segregation and sorting.

[0051] In an embodiment of the present invention, processed waste falls in outer rotary screen 145 further size separated through trommel screen 145 with sieves 155 of size 20 mm. Material below 20 mm falls through the sieve and material above 20mm discharged through outlet 118.

[0052] In an embodiment of the present invention, the drum 110 along with the inner screen 105 and outer screen 145 are adapted to constantly rotate together. In general, they rotate at 2 to 5 RPM. The diameter of the drum 110 is taken as 2 meters whereas the diameter of the inner screen 105 is taken as 1 meter and the diameter of outer screen 145 is taken as 2.5 meter. Size of the sieves in inner screen 105 is taken as 80-120mm and size of the sieves in outer screen 145 is taken as 8-25mm. The processing capacity of the apparatus 100 is 5 tons/day of mixed waste.

[0053] The rotation of the inner screen 105 and outer screen 145 are synchronized with drum 110. Additionally, the rotation of the drum 110 results in faster microbial activity due to tumbling of the organic solid waste collected in the drum 110.

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[0054] In an embodiment of the present invention, the apparatus 100 includes a plurality of steel rings 120 fitted around the said drum 110. The steel rings 120 are also visible in Figs. 2 & 4. The steel rings 120 are capable of holding the drum 110 on the support stand 135 and rotate through tyres 125.

[0055] It will be obvious to a person skilled in the art that the product produced by the mechanical and biological process, may vary in their physical and chemical properties and further separation is required to distinguish recyclables or compostable or energy rich refuse drive fuel (RDF) or inert.

[0056] Referring again to Fig. 1, there are nails (not shown) fixed in the interior surface of inner screen 105 near the feed end 107 to break open any bags in the waste material.

[0057] Once the solid wastes are dropped via the sieves into the drum 110, the said dropped and separated solid waste are subjected to conditions for aerobic bio-degradation.

[0058] In an embodiment of the present invention, the apparatus 100 includes drum 110 to work as mechanical biological treatment (MBT) for processing the solid waste being segregated by the inner screen 105 and further outer screen 145 is provided to segregate material treated through drum 110.

[0059] Accordingly, the apparatus 100 includes an outer screen 145 for further size separation of waste bio-decomposed in rotary cylindrical drum 110.

[0060] In an embodiment, the bio-decomposition in rotary cylindrical drum 110 is natural biological activities by naturally occurring microorganisms, such as bacteria and fungi, for decomposing organic food waste. To accelerate decomposition aerobic bacterial culture are added into the drum 110. The organisms responsible for decomposition consume organic materials and oxygen in order to grow and reproduce. In the process, they produce carbon dioxide, water vapors and heat that are vented through holes in inner screen 105.

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[0061] The said integrated apparatus 100 has a special drying capability. In the apparatus 100, the drying of the wastes relies on biological activities of microorganisms, bacteria and fungi, accelerated by culture to reduce the moisture content of wet waste.

[0062] The drying effect is achieved because of the microbial activity as well as aeration due to bio-decomposition in the drum 110 of the said integrated apparatus 100. As the microorganisms feed on the nutrients, carbon (C), nitrogen (N) and other elements available in the waste, heat is produced as part of the metabolic activities. This heat, assisted by air, is used to evaporate the excess moisture. The energy necessary for evaporation is provided mainly by aerobic biodegradation. Decomposers in aerobic digestion process require oxygen to work their magic. The oxygen consumed during decomposition is continually replaced through holes or sieves in the inner screen 105 and through slits 150.

[0063] In an embodiment, the aerobic decomposition of organic matter by micro-organisms raises matrix temperatures in the drum 110 to the thermophilic range (55-68°C). Exothermic biochemical transformation helps in drying of organic material without applying external source of heat.

[0064] In other words, heat generated by the microorganisms during composting raises the temperature of the decomposing materials in the section 142 of the drum 110. Material temperatures in a drum often rise above 50°C and sometimes exceed 70°C. High temperatures have the advantage of killing pathogens (microorganisms that cause disease) and weed seeds. The micro-organisms require oxygen in aerobic digestion. The oxygen consumed during decomposition continually replaced through holes in screen 105 and slits 150.

[0065] In addition, continuous turning and tumbling in rotating drum 110 creates path way for aeration through material and helps to loosen the compacted particles and improves aeration. Therefore, constant turning/rotation of drum 110 helps in faster decomposition of material, improves porosity and oxygen content in material. Constant turning in rotating drum 110 also helps in removing moisture and redistribute cooler and hotter portions of the material. Rotary movement of drum 110 not only breaks

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down biodegradable waste, but they also increase the rate of biodegradation. Decomposer organisms work on the surface of particles. Rotating drum 110 break down organic material in smaller particles offer more surface area for decomposition. As decomposition progresses, particles shrink in size and tend to compact.

[0066] From start to finish, the bio degradable waste in the section 142 of the drum 110 transforms from a diverse mixture of individual ingredients to a uniform material. The waste materials remain in the drum for 24 to 48 hrs. After this period, multiple slits 150 provided at discharge end are opened for falling of waste from drum 110 to outer screen 145 for screening and discharge and for further segregation on the basis of their chemical properties.

[0067] Moreover, from these slits 150, waste falls on outer screen 145. The outer screen 145 comprises sieves of size 12-30mm. While passing through outer screen 145, the said processed waste is further separated in two different size segments. Further, segregation from these two fractions for recyclables or other recovery can be done manually or otherwise.

[0068] For example, many solid contaminants can more readily be separated after passing through the apparatus 100. Breakdown of soft organic matter facilitates further separation of the said waste. It is much easier for people to separate materials from dried and crushed organic waste of similar size, as small items are not buried under large uneven stinky waste. Finally, the waste is segregated into three fractions, namely:-

1. Recyclables, RDF and inert of size of above 100 mm,
2. Recyclables, RDF and inert of size between 20 mm and 100mm, and
3. Compostable organic waste of size of below 20mm.

[0069] As a final product derivable from the said integrated apparatus 100, the process employed in the section 142 of the drum 110 reduces waste quantity by 70-90%. Further, the integrated apparatus 100 separates non-degradable from biodegradable. Also, the integrated apparatus 100 helps in Recovery of Recyclables and RDF in much more easy, efficient and hygienic conditions.

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[0070] After processing with the integrated apparatus 100, the segregated paper, metals, plastic, glassware, RDF & other valuable materials go to recyclers or consumers. Further, organic wastes of less than 20mm shall move to consumers or compost plant. Moreover, after recovery of valuables only 10-30% inert is left for sanitary land filling.

[0071] Fig. 4 provides a top view of the apparatus 100. In the said figure, there is shown a cross sectional line AA passing through the center of the apparatus 100. In Fig. 5, there is shown a cross sectional view across the line AA. The various components of the apparatus 100 are visible in the said cross section view of the apparatus. Additionally, a slits 150 are also shown towards the end of the drum 110. Through these slits 150, the processed odor free product passes through and dropped into the outer cylindrical screen 145.

[0072] The integrated apparatus 100 as disclosed has various advantages. The said integrated apparatus reduces the burden of municipal authorities as efficient recyclable recovery, moisture removal, size reduction and compaction of waste results in substantial reduction of collection, transportation and disposal cost.

[0073] Municipal bodies can install the apparatus to process waste in different parts of city as required. Therefore, the apparatus diminishes land requirement for additional landfill and centralized waste processing plants.

[0074] Moreover, said apparatus when used can convert waste collection centers into material recovery/processing facilities with installation of the said apparatus at decentralized locations near the origin of waste generation.

[0075] Accordingly, the said apparatus is a tool to municipal bodies to get rid of garbage menace. The apparatus requires very much less space and hence can be installed at waste storage sites in heavily populated areas of cities.

[0076] The apparatus shall be acceptable to public as open waste storage shall be replaced by closed system. The said apparatus can finish ugly open storage and foul smell from cities. Moreover, the said apparatus minimizes risks of public health as rodents can be ignored and waste turns to compost.

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[0077] Air water and land pollution reduces with reduction of waste with the apparatus. Further, the decentralized waste management process by using the said apparatus can involve rag pickers and waste collectors in an organized way. By the aid of apparatus there shall be substantial increase in the income of rag pickers and scavengers most deprived classes of society.

[0078] The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the present invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the present invention and its practical application, and to thereby enable others skilled in the art to best utilize the present invention and various embodiments with various modifications as are suited to the particular use contemplated. It is understood that various omissions and substitutions of equivalents are contemplated as circumstances may suggest or render expedient, but such omissions and substitutions are intended to cover the application or implementation without departing from the spirit or scope of the present invention.

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CLAIMS

What is claimed is:

1. An integrated apparatus for separating and processing of Municipal solid waste, the apparatus comprising:

a rotary cylindrical drum capable of being rotated by electro-mechanical energy;

an inner rotary cylindrical screen mounted within the rotary cylindrical drum;

an outer rotary cylindrical screen being connected with the rotary cylindrical drum at a discharge end of the rotary cylindrical drum,

wherein both the inner and outer rotary cylindrical screens comprise a plurality of sieves capable of separating the solid waste based upon the variable sizes of the solid waste, the said inner screen capable of segregating the separated solid waste in the rotary cylindrical drum for collection of the said waste in the said rotary cylindrical drum and capable of passing larger waste through the discharge opening of the said rotary cylindrical screen; and

a bio-decomposing section provided in the rotary cylindrical drum, the bio-decomposing section comprising a culture of micro-organisms for fermenting and decomposing of separated organic solid waste in the rotary cylindrical drum,

wherein the fermenting and decomposing of the separated organic solid waste produce an odor free compostable product which is passed through the outer rotary cylindrical screen for further segregation, thereby providing an integrated apparatus.

2. The apparatus as claimed in claim 1, wherein the rotary cylindrical drum and both the inner and outer rotary cylindrical screens rotate simultaneously by a rotating assembly.

3. The apparatus as claimed in claim 1, wherein the rotary cylindrical drum comprises a plurality of slits for discharging the odor free compostable product into the outer rotary cylindrical screen.

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4. The apparatus as claimed in claim 1, wherein the fermenting and decomposing of the solid waste results in drying of the said solid waste by heat generated during the fermenting and decomposing of the said waste by the culture of micro-organisms.

5. The apparatus as claimed in claim 1, wherein along with mechanical biological treatment to organic waste said rotary cylindrical screens size separates waste in three fractions simultaneously by rotation of the rotary cylindrical screen.

6. The apparatus as claimed in claim 5, wherein the said rotary cylindrical screen is a trommel screen.

7. The apparatus as claimed in claim 5, wherein the separated organic solid waste is fermented and decomposed by the culture of micro-organisms in the rotary cylindrical drum.

8. The apparatus as claimed in claim 7, wherein rotation of the rotary cylindrical drum results in faster microbial activity due to tumbling of the organic solid waste in the rotary cylindrical drum.

9. The apparatus as claimed in claim 1 comprising a rugged stand adapted to support the cylindrical drum, the stand having a plurality of legs for supporting the said rotary cylindrical drum.

10. The apparatus as claimed in claim 9, wherein the plurality of legs have a length to provide an incline to the said supported rotary cylindrical drum at the discharge opening.

11. The apparatus as claimed in claim 10, wherein the said inclination allows the waste to slide through the discharge opening by force of gravity.

12. The apparatus as claimed in claim 11 comprising a plurality of steel rings fitted around the said rotary cylindrical drum, the steel rings are capable of holding the drum on the support stand and rotate the drum.

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13. The apparatus as claimed in claim 1, wherein the inner rotary cylindrical screen has an abutting length greater than the drum for providing an elongated discharge opening.

14. The apparatus as claimed in claim 1, wherein both the inner and outer rotary cylindrical screens comprise a plurality of sieves having varying sizes.

Dated this 22nd Day of October, 2016

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IN/PA-1124
Agent for the Applicant

38**ABSTRACT**

Disclosed is an integrated apparatus for separating and processing of solid waste. The integrated apparatus includes a rotary cylindrical drum. Further, the apparatus includes two rotary cylindrical screens, the inner rotary cylindrical screen is mounted within the rotary cylindrical drum and the outer rotary cylindrical screen is attached at the outer of drum at discharge end. Both the rotary cylindrical screens include a plurality of sieves which are capable of separating the solid waste based upon the variable sizes of the solid waste. The inner screen is capable of passing larger waste through a discharge opening and further capable of segregating the separated solid waste in the rotary cylindrical drum for collection of the said waste in the said rotary cylindrical drum. The apparatus also includes a bio-decomposing section in the rotary cylindrical drum. In the said bio-decomposing section, a culture of micro-organisms ferments and decomposes the separated organic solid waste in the rotary cylindrical drum. Mechanically-Biologically treated organic waste is further size separated through the outer rotary cylindrical screen at discharge end.

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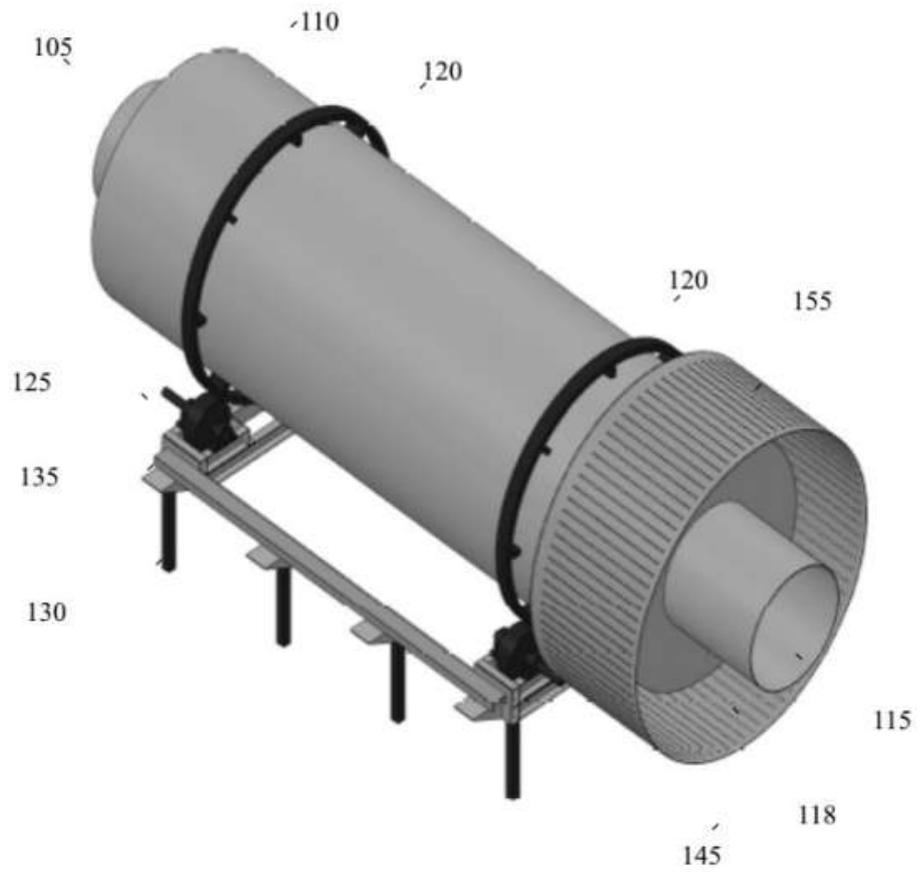


Fig. 1

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APPLICANT: Palta Engineering Works Pvt. Ltd.

Page 2 of 3

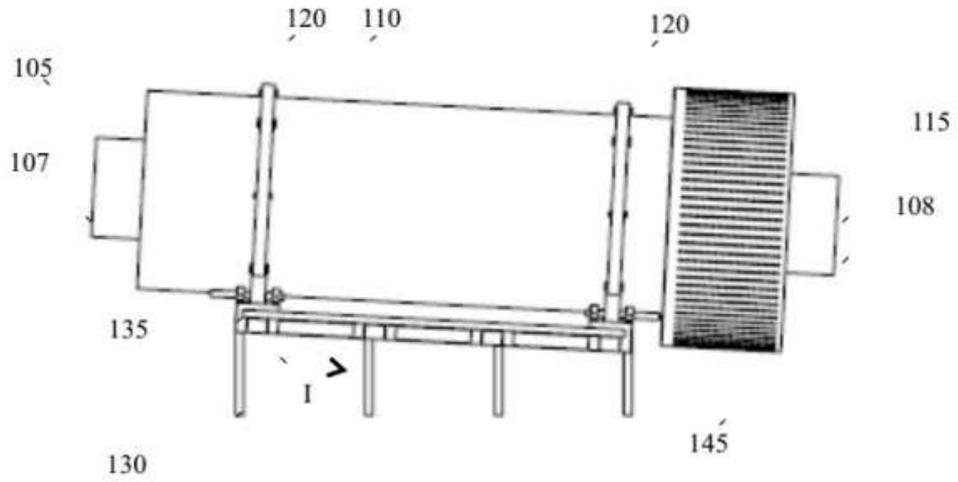


Fig. 2

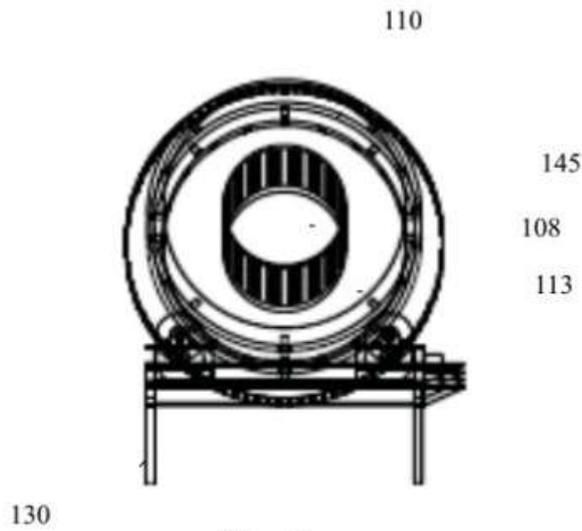


Fig. 3

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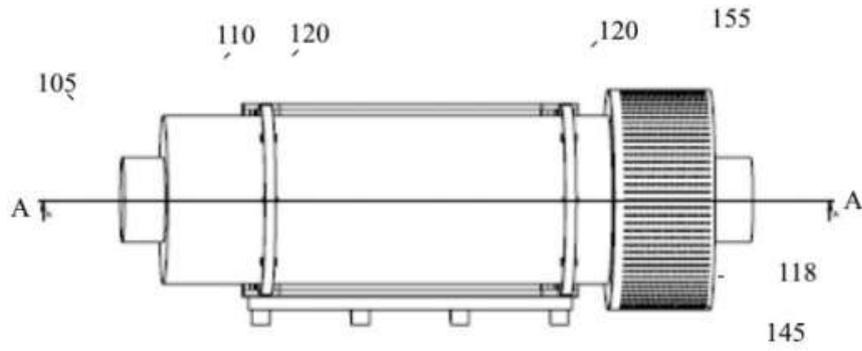


Fig. 4

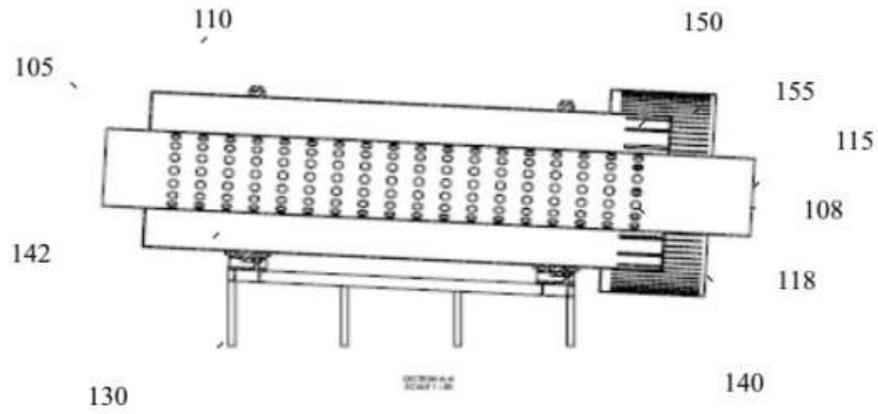
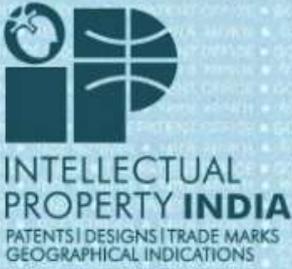


Fig. 5

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क्रमांक : 011126306
SL No :



भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE
पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No. : 345901
आवेदन सं. / Application No. : 201611036195
फाइल करने की तारीख / Date of Filing : 22/10/2016
पेटेंटी / Patentee : E3 waste Solutions

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित INTEGRATED APPARATUS FOR SEPARATING AND PROCESSING OF MUNICIPAL SOLID WASTE नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 22nd day of October 2016 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled INTEGRATED APPARATUS FOR SEPARATING AND PROCESSING OF MUNICIPAL SOLID WASTE as disclosed in the above mentioned application for the term of 20 years from the 22nd day of October 2016 in accordance with the provisions of the Patents Act,1970.



अनुदान की तारीख : 02/09/2020
Date of Grant :

पेटेंट नियंत्रक
Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, 22nd day of October 2018 को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।
Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 22nd day of October 2018 and on the same day in every year thereafter.



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**52 Applicants are considered for Grant-in-Aid Support upto Rs. 1 Cr
under Atal New India Challenge**

Atal New India Challenge (ANIC) is an initiative by Atal Innovation Mission (AIM) aimed towards supporting innovators creating products based on advanced technologies in areas of national importance and social relevance through a grant-based mechanism, while addressing the second Commercialization Valley of Death, in which innovators are unable to access resources for piloting, testing, and market creation. The vision of the ANIC is two-fold: (a) help create products from existing technologies relevant for national and social causes (productization); (b) help new deep-tech products find markets and early customers (commercialization) in the context of India. The scope of the program extends to developing an institutional mechanism and structure to channel potential innovative ideas for products and technologies from Startups and MSMEs on their own or along with organizations, academic institutions and even individual innovators.

AIM launched the ANIC with five partner Ministries / Departments of the Government of India for 24 different challenges wherein over 950 applicants have participated.

Selection of Grantees for ANIC

A Screening cum Selection Committee was formed under consisting of experts from various sectors and partnering ministries / department representatives. The preliminary screening for sanity of applications as per ANIC Guidelines was done for verification of their eligibility with regard to submission of mandatory documents and type of entity. Subsequently, 519 applications were shortlisted for secondary evaluation by third party reviewers like AIM supported incubators and other partner incubators. The results were analyzed and as per mandate the top 143 applications were shortlisted for presentation before Screening-cum-Selection Committee (SSC) meeting which was held on 11th-12th March, 2019 at NITI Aayog. A total of 102 applicants (out of 143) presented before the SSC, and based on the recommendations of the Committee,

- **26 applicants have been selected for ANIC Grant-in-Aid support subject to their compliance to ANIC Innovation Deployment Guidelines (Further details given in Annexure 1)**
- **26 have been selected for handholding support and subsequently evaluating their readiness for ANIC Grant-in-Aid in compliance to the program's Innovation Deployment guidelines (Further details given in Annexure 2)**

It is further noted that that the shortlisted applicants as per Table 1 and Table 2 will be called for a discussion on ANIC Innovation Deployment Guidelines and the further plan of action. They would be required to adhere to the ANIC Deployment Guidelines to avail the support offered by AIM, NITI Aayog. Applicants will not be entitled for any No TA / DA for attending this meeting.

It is to be noted that the applicants who were physically present for the final presentation before the SSC, can also be considered for relevant incubator support in nurturing their innovation, they will be required to separately write to avail this benefit without any financial support directly by AIM. The decision of AIM collaborating incubator shall be final and AIM shall not have any influence / specific recommendation for the same.

Annexure 1

Table : 1 : The detail of shortlisted applicants for support under ANIC Grant-in-Aid subject to their compliance to ANIC Innovation Deployment Guidelines:

Ministry	Challenge Area	Applicant Details with Innovation Brief
Road Transport and Highways	Alternate fuel- based transportation	<ul style="list-style-type: none"> • Mayur Patil, Small Spark Concepts Technologies Pvt. Ltd. (patent pending air filter technology to improve fuel efficiency and curb harmful vehicular emissions) • John Abraham, Kerala Veterinary and Animal Sciences University (Bio-diesel production from chicken slaughter waste is a project that produces three products from a health hazardous waste: Bio-diesel- a renewable fuel, bio-fertilizer for organic farming and glycerol for soap making.)
	Smart Mobility	No suitable applicant found
	Electric Mobility	<ul style="list-style-type: none"> • Rakesh MK, Meladath Auto Components Private Limited (electric conversion kit which can convert the existing petrol scooters to a hybrid within 30 minutes without any modification to the existing scooters) • Rajeev Ranadive, Pixy Electric Cars Pvt Ltd (Bolt-On Electric Conversion kit for converting existing cars to full electric) • Nikhil Gonzalves, Ingo Electric (Portable Mobility in controlled environments – a new battery Chemistry invented)

	Safe transport	<ul style="list-style-type: none"> • Raghavendra Mysore, Sirab Technologies Transportation Private Limited (patented automated vehicle guidance system- aims to better integrate proven technologies to achieve desired objective of higher lane utilization, fuel efficiencies, business-model and methodology to scale) • Mitesh Rasal (wheels which have suspension integrated replacing the spokes) • Smitiparna Satpathy, Tycheejuno Speciality Tyres Private Limited (Anti Burst, Anti Puncture Tyre with patented BPPC Technology) • Amit Pathak, Shellios Technolabs Pvt Ltd (PUROS anti-pollution helmet, which is a Patented device with an air purification system integrated in the form factor. It is BIS Certified and readying to launch in Early 2019.) • Shampa Choudhary, Tejas Translational Technologies Private Limited (connect all mobility dots in the Cities & mobilize efficiency and sustainability by atleast 30%, hence, bringing mobility experience faster and economical for citizens) • Rahul Sharma (a complete system that tracks, authorizes aerial vehicles while keeping them away from No-Fly zones)
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Agriculture and Farmers' Welfare	Climate-smart agriculture	<ul style="list-style-type: none"> • Sakthivelu K (Soil Moisture Sensor) • Renuka Karandikar, Bioprime Agrisolutions Pvt Ltd (bio-chemicals that modulate physiological responses manifested by the plants.) • Lokesh Makam, Barrix Agro Sciences Pvt Ltd (Fly trap stereoisomer in Kerala) • Mahesh SS, Grus Ecosciences (Vibration Sensor to detect larval haemolymph) • Katherine Anne Taylor, Khethworks Pvt Ltd (Submersible solar pumps) • Avinash KR, Vyoda Private Limited (Solar pump) • Pracheer Dutta, Kriya Labs Pvt Ltd (Small scale pulp making units) • Girish Aivalli, Intello Labs Private Limited (Image based quality testing of agri-produce) • Vasant Bhat, TRITHI Robotics Pvt Ltd (Drone services for precision farming)
Railways	Fog vision system for road and rail	No suitable applicant found
	Systems to predict identify and recognize rail failure using technologies	No suitable applicant found
	Predictive Maintenance of Rolling Stock	No suitable applicant found
Drinking Water and Sanitation	Instant Portable Water Quality Testing	<ul style="list-style-type: none"> • Pradeep Balkunde, Foundation For Environmental Monitoring (Smartphone based Colorimetric analysis of heavy metals in water)
	Sustaining drinking water sources	No suitable applicant found

	Digital Water Management	No suitable applicant found
	Providing potable water to water quality affected areas	<ul style="list-style-type: none"> • Indra Sen, Nature Annalytics (framework for assessing contamination levels in a centralized manner and providing, from the user perspective, clean water at significantly reduced cost and complexity compared to currently available solutions)
	Data analytics for water governance	No suitable applicant found
	Mini Desalination plants in coastal areas	No suitable applicant found
	Grey water management	No suitable applicant found
	Affordable Desalination/Recycling Technology	No suitable applicant found
	Waste management recycling and reuse	<ul style="list-style-type: none"> • Suraj Nandkumar, Recity Network Private Limited (It is a city resource management organization with current focus on 'Waste as a resource'. This is done by creating platforms where government, citizens, waste workers and experts interact and problem- solve together) • Dr. Narendra Reddy, Agringenium Innovations Private Limited (Technology to utilize agricultural residues such as straws, bagasse, coir etc in their original form to develop bioproducts for high value applications such as biodegradable packaging boxes, false ceiling tiles, sapling trays, cups and containers.) • Cibhi Sel Ven, Regeno Ventures Pvt. Ltd., (A biodegradable and compostable replacement for single use plastics made from vegetable starch and other natural extracts.)
	Cleaning of Sewers and Septic Tanks	No suitable applicant found

Housing and Urban Affairs	Garbage composition devices	No suitable applicant found
	Quality of compost	No suitable applicant found
	Decentralized composting	No suitable applicant found
	Mixing blades for composting	No suitable applicant found
	Waste in public spaces	<ul style="list-style-type: none"> Siddhant Tawarawala (patented uni-sexual pocket toilet which ensures high standards of hygiene and can be used both for indoor or outdoor purposes)
	Dissuading public littering	No suitable applicant found

Table : 2 : The following applicants are also shortlisted for Handholding Support through Atal Incubation Centres or any suitable incubation centre / facilitation agencies wherein the SSC has concluded that applicants need proper handholding prior to deployment of their innovation and subsequently their consideration for ANIC Grant-in-Aid Support will be further evaluated separately in compliance to ANIC Innovation Deployment Guidelines :

Ministry	Challenge Area	Applicant Details with Innovation Brief
Road Transport and Highways	Alternate fuel- based transportation	No suitable applicant found
	Smart Mobility	No suitable applicant found
	Electric Mobility	<ul style="list-style-type: none"> • Amit Raje, Faradigm Ultracapacitors Pvt Ltd. (Ultracapacitors for Battery Less / Battery Assist EVs in city feeder routes, designed to maximize the recuperation and reuse of regenerative braking energy) • Sanjeev Kumar, Criollo Automobiles LLP (Ultracapacitors for Battery Less / Battery Assisted EVs in city feeder routes) • Mahesh Mahajan, Angadi Institute of Technology And Management (A new design of electric vehicle)
	Safe transport	<ul style="list-style-type: none"> • Prakash Govindaya Merala (Innovative System that can douse Car Fire with just a press of a Switch) • Varun Seth, Matisoft Cyber Security Labs (Technology replicates the brain of a human cyber security expert & combines it with the compute capacity of the device to make a truly smart engine that intelligently protects the device against virus attacks)

<p>Agriculture and Farmers' Welfare</p>	<p>Climate-smart agriculture</p>	<ul style="list-style-type: none"> • Damodhar Paleti, Suyoga Software Solutions Pvt Ltd (Suyoga Kisaan, Developed an easy-to-use Kisaan2Kitchen (K2K) Agri E-commerce Solution for the perishable produce market) • Vinay Palaparthi, Proximal Soilsens Technologies Private Limited (Developed an early stage plant diseases prediction system and provides control measures) • Ekta Jaju, Onganic Foods Private Limited [An Organic Social Enterprise (www.ONganic.in) based in East India and works directly with organic small holder certified grower groups through a seed to shelf model] • Rahul Ganapathy, Atsuya Technologies Pvt Ltd. [The technology leverages the power of IoT (the internet of things) to offer a state-of-the-art yet intuitive and cost-effective solution to the problem of refrigerated product wastage.] • Rohit Shah, Kalki Ecosphere LLP (An improved filter cum storage container for liquid which functions in a single container by sharing and adjusting the space for process and storage.
<p>Railways</p>	<p>Fog vision system for road and rail</p>	<ul style="list-style-type: none"> • Shashikala Tapaswi, Renaissance technology Pvt. Ltd. (The proposed solution will be in the form of a device named Dradh Drishti Prabhardhan (DDP). A prototype of DDP has been developed in Cloud-Computing (CC) Lab at ABV-IIITM, Gwalior.) • Surya Satyavolu, Sirab Technologies Transportation Private Limited (a computerized system for controlling automotive functions of a vehicle, includes a multi-core system on chip; a hypervisor including a multi-core synchronization function for a plurality of cores on the system on chip; and a plurality of automotive function modules in communication with the plurality of cores through the hypervisor)

	Systems to predict identify and recognize rail failure using technologies	<ul style="list-style-type: none"> Dhirendra Singh, Renaissance technology Pvt. Ltd. (Advanced Loco-pilot Assistance System (ALAS), Loco Pilot drowsiness/Stress detection and alert system, Signal Jump alert/warning with Emergency Braking System (EBS), Front Long Range Radar to see in fog and rainy condition)
	Predictive Maintenance of Rolling Stock	<ul style="list-style-type: none"> Arshad Pulikkal, Bytematics Technologies Private Limited (A product suit which takes care of preventive maintenance, post breakdown management and predictive maintenance)
Drinking Water and Sanitation	Instant Portable Water Quality Testing	No suitable applicant found
	Sustaining drinking water sources	<ul style="list-style-type: none"> Dr. G. Panduranga Murthy, Maharaja Research Foundation (A technology for improving the water discharging capacities in tandem with hydraulic behavior followed by reviving and restoration of Talapariges, a shallow water natural spring, with techno-economic feasibility) Gayatri Deshpande, (Adaptation of Permeable Articulated Concrete Blocks (PACB) in Indian conditions to develop a method for efficient water harvesting.)
	Digital Water Management	No suitable applicant found
	Providing potable water to water quality affected areas	<ul style="list-style-type: none"> Ajinkya Dhariya, (Solar distillation process along with natural filtration for making potable water)
	Data analytics for water governance	No suitable applicant found
	Mini Desalination plants in coastal areas	No suitable applicant found

Housing and Urban Affairs	Grey water management	<ul style="list-style-type: none"> Gadhadar Reddy, NoPo Nanotechnologies India Private Limited (Developed a Carbon Nanotube based Water Purifier that makes use of the unique water transport phenomenon observed in the small diameter (0.6-1nm) single walled carbon nanotubes (SWCNT). This process is 1000x times more efficient than the biological pores.)
	Affordable Desalination/Recycling Technology	No suitable applicant found
	Waste management recycling and reuse	<ul style="list-style-type: none"> Dr. S. Krupakar Murali, (Conversion of waste into liquid fertiliser and bio-pesticide) Dr. Charu Khosla, Chitkara University (Developed a Biomass cooking stove which is an Improved Forced Draft Biopellet Stove with a high Thermal Efficiency and very low TPM content and CO emissions and can operate on more than one alternate fuel) Anurag Asati, Asar Green Kabadi Pvt Ltd (thekabadiwala.com) [Working on SaaS (Software as a Service) based model for technology platform to make Smart Waste Management system] Dr Padma Shree Vankar (RAMPAD development of an adsorbent which can change the color and odor of used frying oil)
	Cleaning of Sewers and Septic Tanks	No suitable applicant found
	Garbage composition devices	<ul style="list-style-type: none"> Sreevidya Ramanathapuram Kandavelu (Domestic Garbage treatment device)
	Quality of compost	<ul style="list-style-type: none"> Ponram P, Tejas Translational Technologies Private Limited (Measuring the quality of compost by means of measuring the quantity of decomposition, through gases that emanate as a result of decomposition)

	Decentralized composting	<ul style="list-style-type: none"> Ajay Palta, Palta Engineering Works Pvt. Ltd. (XAPER, a three-in-one patented technology, is capable of handling mixed waste, segregated wet waste as well as segregated non-biodegradable waste by a single machine. It has been designed to be used in a decentralized mode, particularly for areas where segregation is a challenge or there are space constraints) Poonam Bir, PBK Waste Solutions Pvt. Ltd. (Prototyped and designed a new community composter - the Aaga, also currently working on building a sensor-based app to measure the weight of organic compost in the Aaga community composter so that customers can see the amount of waste they are keeping away from landfills, compare their data with neighbours and be inspired to improve their performance)
	Mixing blades for composting	No suitable applicant found
	Waste in public spaces	No suitable applicant found
	Dissuading public littering	No suitable applicant found

The ANIC result announcement issued with the approval by competent authority of Atal Innovation Mission.

Sd/-
(R. Ramanan)
Mission Director,
Atal Innovation Mission,
NITI Aayog, Govt. of India



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Office of the Principal Scientific Adviser
to the Government of India

Office of Principal Scientific Adviser, Government of India

India's Waste to Wealth Mission

Global Request for Proposals

In partnership mode

**“Waste Mining & Land Recovery of the
Ghazipur Dump Site in New Delhi”**



I. Introduction

The Office of Principal Scientific Adviser (PSA) to the Government of India under the aegis of Prime Minister –Science, Technology and Innovation Advisory Council (PM- STIAC) has identified “Waste to Wealth” as one of the nine priority missions with the aim to identify, develop and deploy technologies to treat waste.

The office of PSA is issuing a global Request for Proposals (RFP) in partnership mode for “*Waste Mining and Land Recovery at Ghazipur Dump Site in New Delhi*”. The RFP aims to undertake deployment and implementation of proven technological solutions for the two challenges of the Ghazipur Dump Site:

- a) Removal and valorization of the legacy waste at the open dump/ landfill site; which is approximately 14 million tones of mixed waste (details of the Ghazipur Dump Site are provided in Annexure)
- b) Management and treatment of the continuous inflow of 2200 tons of fresh waste per day.

Ghazipur “waste dump” in Delhi is cause of serious environmental problems, ranging from local pollution concerns (health, soil and water) and land-use restrictions to global impacts in terms of greenhouse-gas emissions. Landfills are one of the major sources of methane and other green house gases emissions.

The RFP is looking for setting up pilot demonstration units towards integrated valorisation and reclamation of land from the waste dump with possible enhanced mining extraction, valuable materials from both landfill legacy waste and fresh daily waste.

Waste treatment and management is the highest priority of the Government of India and the RFP is seeking for government departments, private industries/companies, academia, and civil society from India or outside of India, to come together for providing solutions for the treatment and management of Ghazipur Dump Site in Delhi.



The Proposed technology (ies):

- Could be a combination of pyrolysis, hydrolysis, electrolysis, biodegradation, hydro/ion metallurgical etc unit operations, as well all residual matrix valorization technologies, for mitigation and complete degradation of Ghazipur landfill waste.
- Should integrate with both recycling/urban mining and other landfill mining concepts such as temporary storage places, bioreactors, and sustainable landfilling;
- Should be for excavation, separation/recovery, transformation/up cycling in view of improved resource utilization efficiency;
- Should develop and apply scientifically based methods for evaluating mining technology methods in terms of social, environmental and economic impacts, from a local, regional to global perspective;
- Must disseminate the technological and non-technological features of technologies to a diversity of audiences including local communities for east adoption and scalability.

The expected impact/outcomes of the pilot studies are as follows:

- Meeting the Global Sustainable Development goals
- Valorization of matrix material to high value products
- Environmental and Health Impact Assessment
- Development of new business cases with regard to landfill mining.

II. Invitation for proposal

The office of Principal Scientific Adviser (PSA) to Government of India in partnership with East Delhi Municipal Corporation (EDMC) invites proposals from technology partners for recovery of land at Ghazipur open dump site in New Delhi by demonstration/ implementation of technology for amelioration of the landfill waste. Multiple technologies may be selected for implementation at the Ghazipur Landfill site, operating in parallel to address the landfill challenge in a multi-pronged fashion. Pilot demonstration units will be set up in the land adjacent to the landfill and the waste from the landfill will be provided to each pilot project.



The implementation of the pilot demonstration project provides an opportunity for companies to validate technologies in real-time conditions.

The details of the RFP are as below:

III. Objective

The Ghazipur Dump Site/landfill has the following two challenges:

- a) Removal and valorization of the legacy waste at the open dump/ landfill site; which is approximately 14 million tones of mixed waste (details of the Ghazipur Dump Site are provided in Annexure)
- b) Management and treatment of the continuous flow of 2200 tons of fresh waste per day.

These solutions should be demonstration of implementation, validation and efficacy of technology to bring about amelioration of the waste, mining and valorization of the legacy waste; treatment of leachates and mitigation of contaminated subsoil & groundwater. Segregation of fresh waste at source and complete utilization and recycling to avoid addition of waste to the Ghazipur Dump Site. The most ambitious expected outcome is zero landfill.

The proposals can address either one or both the challenges as below, in one application.

- a) Legacy waste
- b) Fresh daily waste
- c) Both legacy and fresh daily waste

IV. Eligibility criteria/ Who can apply?

1. Industries working on waste treatment having technologies which can be real time complex waste conditions like Ghazipur waste dump.
2. Entities from India and Out of India can both apply.
3. The applicant may be a single specified entity, or a group of entities joined together as a consortium. In case of consortium, the lead partner must be clearly identified and shall be liable for fulfilling all and any obligations towards the proposal goals.



4. Should not have been blacklisted or debarred from participating in tenders by any Central / State Government agencies or autonomous bodies or universities/ institutions. (An undertaking to this affect should be furnished).
5. In case of non-Indian entities, should not have been named in any sanction from any nation, nor should have been held guilty under various anti-corruption/anti-malpractice laws worldwide. An undertaking to the effect must be furnished.
6. The applicant should have established, validated and field-tested technology targeting either one or both challenges as at III a & III b.
7. The applicant should have demonstrated expertise in environment, health and safety (EHS) aspects and impacts that need to be addressed at dump site while cleaning up the site.
8. It is preferred that the applicant should have prior experience in dealing with legacy and or fresh waste, including waste of hazardous and infectious waste.
9. Should submit the following documents:
 - a) List of similar projects undertaken in the past (including completed and ongoing projects, in India and abroad) with details as per form given in Appendix I. Further information may be sought in case deemed enquired.
 - b) Company Registration certificate and in case of partnership company, partnership deed with power of attorney. In case of non-Indian entity, equivalent documents must be furnished (similarly for items c-f below)
 - c) PAN Card of the firm
 - d) Latest clearance of IT,VAT/CST,P.TAX, Service TAX, Trade license, Work permit, if applicable
 - e) Audited Statement of Accounts for the last three financial years.
 - f) List of clients presently being served/have been served in past for similar work, with Contact name, address and mobile no.

V. Duration of the Project: 18 Months

VI. GOI will provide the following support:

1. Funds for the implementation of pilot



2. Land for setting up the pilot
3. Other logistic support such as transportation of waste, clearances etc.
4. Support may be considered for scale up of successfully demonstrated technologies based on the merit and socio-economic impact of the technology.

VII. Expected responsibilities of the company/ industry:

1. Make part financial and/or in kind contributions towards the setting up of the pilot.
2. Run/ Manage project for 18 months.
3. Contribution by the company (ies) will add weightage for RFP application evaluation.

VIII. Evaluation criteria

The proposals shall be evaluated on the basis of the work plan, and the outcomes of the proof of concept technology validation, the contribution of the industry partners in the implementation of the pilot project end to end, and the commitment to transform the Ghazipur waste site to a clean and green location. A committee, under the aegis of Ministry of Science and Technology and the office of the Principal Scientific Adviser (PSA), shall review the applications.

IX. Confidentiality

Information relating to the examination, evaluation, comparison, and post qualification of application, and recommendation of contract award, shall not be disclosed to applicant or any other persons not officially concerned with such process, until the award of the contract.

Any attempt by applicant to influence the evaluation authority or other officials in the examination, evaluation, comparison, and post qualification of the application or Contract award decisions may result in the rejection of their application.

X. IPR

Prior IP will be protected.



Office of the Principal Scientific Adviser
to the Government of India

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XI. Proposal Proforma (to be filled online at <http://psa.gov.in/rfp/>)

1. Basic Information

Proposed project title

2. Details of the applicant.

Company/Institution Details

Name of the Institution/Company

Address

Street/Village

City/Town

State

Country

Pin/Zip code

Landline

Mobile no

Website (if available)

Principal Key Investigator Details

Title

First Name

Last Name

E-mail

Postal Address

Pin/Zip Code

Landline

Mobile

3. Does the application have collaborators?

YES

NO



If yes,

Collaborators' Details

Collaborator I

Title

First Name

Last Name

Name of the Institute

E-mail

Postal Address

Pin/Zip Code

Landline

Mobile

4. Waste technology challenge objective a) or objective b) or c)
5. Provide details of the technology to be validated on site
6. Proposal work plan and timeline

S. No.	Methodology/Experimental Design Detailed Work Plan	Timeline	Alternate Strategies	Process Indicator for Measuring Success

7. Requirements for land (near the landfill or otherwise, please include total area needed)
8. Budget requirements/details and justification requirement (***Release schedule will be worked out according to timelines.**)
9. Contribution of the company towards setting up the pilot in cash and kind
10. Have you tested the proposed technology in the field elsewhere, if yes, provide details of the project and the outcomes achieved?
11. Any other relevant details.
12. Details for the project management.



The applicants can submit their proposal **online** only. For submission of Proposal, institution/ companies need to register online at the PSA website (*The call microsite will be up by 10th July, 2019*).

The selected applicants shall be invited for a **final presentation**. Selected technologies that are successfully validated using Ghazipur waste in the 18-month pilot, shall be considered for further scale up.

XII. Timeline

1.	Call opens on	July 10, 2019
2.	Call closes on	August 5, 2019, 5:30 PM IST
3.	Selection/ announcement of projects by	August 26, 2019
4.	Expected commencement of projects by	October 2, 2019

1. If any date specified herein is a holiday, then the next working day will be considered for the activity and the time will remain the same.
2. The Schedule indicated above is tentative and may change and or the entire schedule under intimation to applicants.



Annexure: About Ghazipur

Characterization of the Ghazipur waste site

The Ghazipur landfill site is located at 28° 27' 30'' N - 77° 19' 40'' E, and was started in the year 1984. It is still in use, despite a planned site life of 25 years. It spreads over an area of approximately 70 acres and is 65 meters high. On an average, 2200 tons of waste is dumped daily at the site. It does not have the attributes of a modern engineered landfill, and can be classified as an open dump site due to its physical characteristics and waste disposal operationsⁱ. It is situated in a constrained area that provides limited space to expand disposal operations outside of the current footprint. At least three million people live within the 10km radius of Ghazipur and the nearest residential settlement is just 200 metres away. The overall quantity of waste disposed of till date is \approx 14 million tons. The dump site holds a very close proximity from various commercial food-chain markets like poultry, fish, dairy farms, etc. The water facilities in the area is partially available by municipal agencies and as a result nearby inhabitants are largely depends upon ground water to supplement daily water requirement. It is proposed to rehabilitate the Ghazipur Dump Site, by managing both the legacy waste and new solid waste being dumped on a daily basis, using bio mining, or any suitable technology or combination of suitable technologies.

General study

Several characterization studies have been carried out at the Ghazipur site. Preliminary studies indicate that the waste is slightly acidic in nature and also non-hazardous based on TCLP. It is also estimated that the organic content is less than 20% at the waste siteⁱⁱ. The waste releases excessive color and excessive soluble salts.

Additionally, the waste dump includes the following constituents: groceries, food scraps, vegetable remains, packing materials, paper, remains of used coal, ash, wood, metals, plastics, ceramics, cloth, glass, etc. Construction & demolition waste consisting of sand, bricks and concrete block are also part of the dump. Further, waste from the adjacent poultry market, fish market, slaughter house, dairy farm and non-infectious hospital waste are also part of the dump. The place has become a home for rats, flies, bacteria, mosquitoes, all having the potential of causing many human diseases. A typical pictorial view of Ghazipur land fill site is shown below:

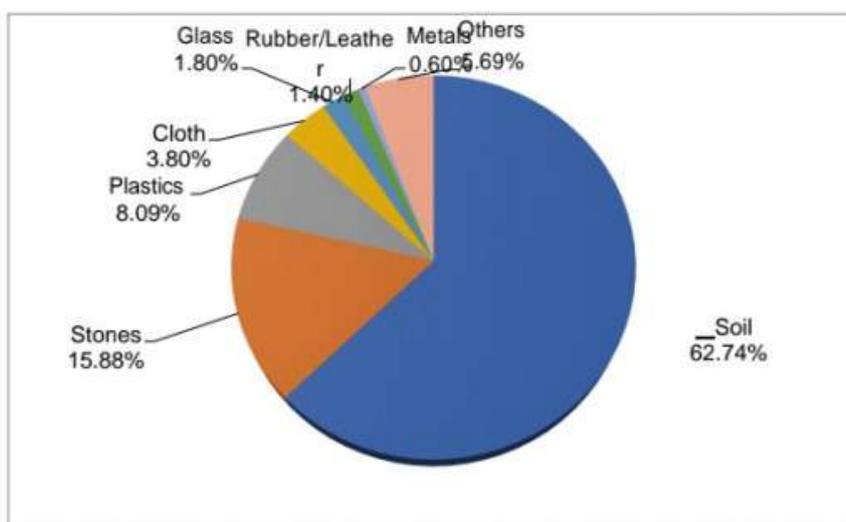




Ghazipur Dump Site

Physical characteristics includeⁱⁱⁱ

- stones constitute > 78% of total weight
- Average moisture in waste – 25%
- Moisture in soil like fraction – 15%



Physical composition of the Ghazipur waste

In a different study, it was reported that the range of methane emission flux was $18\text{mg}/\text{m}^2/\text{h}$ lowest in winter sample and highest $264\text{mg}/\text{m}^2/\text{h}$ in summer sample, and the range of nitrous oxide emission was estimated at $230\text{-}1370\text{ ug}/\text{m}^2/\text{h}$ ^{iv}.

In another IIT Delhi research study, it was reported that the average annual leachate percolation from the base of Ghazipur landfill site has been estimated as 24.36 million litres, using a Hydrologic Evaluation of Landfill Performance model (HELP). In the peak rainy season (month of July), generation of surface run-off even reaches to a level of 1.39 million litres per day. The underground strata around the study area consists of alluvial formation and the basement or hard rock occurs at greater depth around 100 m below ground level (bgl).

Groundwater contamination study

The characteristics of the ground water samples collected around the Ghazipur landfill site has clearly shown an indication of the contamination. Moderately high groundwater samples, which



deteriorates its quality for drinking and other of contamination in the ground water. Especially presence of Cl⁻, NO₃⁻, NH₄⁺ and Fe may be referred as a tracer of contamination in the ground water. The pH value of the collected sample was found to be in the range of 7.5 -8.5. The relatively high values of TDS indicate the presence of inorganic material in the samples. Among the nitrogenous compound, ammonia nitrogen was present in high concentration, this is probably due to the deamination of amino acids during the decomposition of organic compounds

High concentrations of NO₃⁻ were also observed in the samples. The high level of Fe in the groundwater sample indicates that iron and steel scrap are also dumped in the landfill. The dark brown color of the leachate is mainly attributed to soluble organics and inorganics. The samples were also found to be bacteriologically unsafe.

Further, as per the logging results, fresh water aquifer is available within the range of 32 – 58 meters. The groundwater quality improves with the increase in depth and distance of the well from the pollution source. At greater depths (more than 40 m), it was found that leachate percolation becomes gentler and this further improves with the varying distance. This shows the strata b/w 40-60 m is presently safe for ground water withdrawal. It was also observed that leachate percolation usually concentrates in West and North-western sides along with a high concentration of a few parameters on eastern side^v.

The leachate generated from the landfill site is affecting the groundwater quality in the adjacent areas through percolation in the subsoil. Although, the concentrations of a few contaminants were not found to exceed the limits, even then the ground water quality represent a significant threat to public health.

In another study conducted by JNU, it was indicated that the area around landfill site is underlain by fine to medium sand mixed with coarse hard kankar up to a depth of 50-60 m bgl. Sediments below this depth are predominantly clayey in nature. At place, lenses of minor clayey silt horizons are also present within the sand horizon^{vi}

^vGhazipur Landfill Rehabilitation Report, U.S. Environmental Protection Agency and Climate and Clean Air Coalition Municipal Solid Waste Initiative

ⁱⁱ CRRl report, 2016

ⁱⁱⁱ Presentation by EDMC to Scientific Advisory Committee, on January 12, 2018

^{iv}Landfill mining: a case study from Ghazipur landfill area of Delhi, International Journal of Environmental Sciences, 2014

^vGroundwater Contamination From Non-Sanitary Landfill Sites – A Case Study on The Ghazipur Landfill Site, Delhi (India), International Journal of Applied Environmental Sciences, 2017

^{vi}Study of Groundwater Contamination through Landfill Site, NCT Delhi, JNU, 2006

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Prn.SA/SVG/W2W/E3/2020
OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER
TO THE GOVERNMENT OF INDIA

326, VigyanBhawan Annexe
Maulana Azad Road
New Delhi-1100 11

Date: 13th April, 2020

To,
Pay & Accounts Officer
Cabinet Affairs
C-1, Hutments, Dalhousie Road
New Delhi – 110 011.

Sub: Diversion of Fresh Municipal Solid Waste (MSW) from the Landfill by Decentralized Processing and Remediation of Ghazipur Landfill Site by E3 Waste Solutions, Jalandhar, Punjab-regarding.

Sir,

With reference to the Project proposal submitted by M/s E3 Waste solutions, Sodal Saipur Road, Jalandhar, Punjab, I am directed to convey the sanction of the President to the implementation of the above mentioned project at a total cost of Rs. 3.10 Crores (Rupees Three Crores and Ten lakh only) for a duration of 18 months from the date of sanction.

2. The funds released by this office to the E3 Waste solutions shall not be utilized by any involved party for foreign travel, without the explicit advance approval of this office.

3. Project Summary

XAPER is a composter that segregates the different fractions of mixed Municipal Solid Waste (MSW) into recyclables, compost, combustibles and inert material.

- a. The compostable material will be bio-dried and will be transformed into green fuel.
- b. The combustibles will be used as fuel at cement plant.
- c. The inert material will be sent to the C&D waste processing facilities.

Two Units of XAPER with a capacity to process 10 tonnes per day each will be set up at the following locations:

- a. Near Kasturba Drain
- b. Babarpur Drain

4. Milestones

S. No.	Milestones	
1.	Milestone 1	Commencement of Phase I : Installation of first XAPER Unit
2.	Milestone 2	Commencement of Phase II: Installation of second XAPER Unit
3.	Milestone 3	Successful installation of the two XAPER units

K.J. Sibichan
Head of Office
Office of the Principal Scientific Adviser
Government of India

5. **Proposed Milestone-wise budget release:**

Amount in Crores

Milestones 1 (45% of the total budget)	Milestones 2 (45% of the total budget)	Milestones 3 (10% of the total budget)	Total
1.40	1.40	0.30	3.10

6. **Terms & Conditions:** The milestone based release will be after due certification of review committee constituted for the purpose by the O/o PSA to Gol

7. The account shall be payable to the Registrar, E3 Waste Solutions, Sodal Saipur Road, Jalandhar, Punjab electronically, through Real Time Gross Settlement (RTGS), as per the following details, subject to issuance of further orders as per clause no.6 , above:

- | | | |
|-------|---------------------------------------|--|
| (i) | Name of the account holder: | E3 Waste Solutions |
| (ii) | Name and full address of:
the Bank | Uco Bank
Branch, Industrial Area Branch,
Jalandhar Punjab - 144001 |
| (iii) | Bank Account No.: | 08250210003640 |
| (iv) | IFSC code: | UCBA0000825 |

8. The E3 Waste Solutions shall, in due course, submit provisional utilisation certificates to this office for the said releases.

9. The accounts of the E3 Waste Solutions shall be open to inspection and audit both by the Comptroller and Auditor General of India under the provision of CAG (DPC) Act 1971 and internal audit by the Principal Accounts Officer of this office / the MHA, whenever E3 Waste solutions is called upon to do so.

10. The involved expenditure shall be debitible to:

Demand No.	-	47 Cabinet
Major Head	-	2013
00.106	-	Cabinet Secretariat
03	-	O/o The Principal Scientific Adviser
03.02	-	Synergy Project
03.02.31	-	Grants-in-aid General; and/or
03.02.35	-	Grants for creation of capital assets

11. The Sanction issues with the approval of the Chief Accounting Authority in terms of para- 12 of Annexure to M/o Finance,D/o Expenditure O.M No. 5(6)/L&C/2006 dated 1.6.2006 read with OM No. 1(34)/E.II(A)/2010 dated 7.10.2010. The advice of Integrated Finance was conveyed vide Diary No. 3484179 dated 16.3.2020.


K.J. Sibichan
Head of Office
Office of the Principal Scientific Adviser
to the Government of India
New Delhi

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12. The amount of grant sanctioned / released has been entered in the Grant-in-aid register maintained in Form GFR-39 read with Rule 212(4) of GFR at Sl. No. 01 on Page No. 117 of the Expenditure Control Register maintained in this office.

Yours faithfully,



(K.J. Sibichan)
Deputy Secretary to the Govt. of India
Tel. No. 011-23022091

Copy to:

1. AS & FA, IFD, Ministry of Home Affairs, North Block, New Delhi – 110001
2. Shri Ajay Palta, E-3 Waste solutions, Sodal Saipur Road, Jalandhar, Punjab
3. Dr. Shailja Vaidya Gupta, Scientist 'H', Office of the Principal Scientific Adviser to the Government of India
4. Staff Officer to the Principal Scientific Adviser to the Government of India.
5. Sr PPS to Scientific Secretary, O/o PSA
6. PPS to HoD, O/o PSA
7. The Drawing and Disbursing Officer, Office of the Principal Scientific Adviser to the Government of India.
8. Sanction Folder
8. Guard File

K.J. Sibichan
Head of Office
Office of the Principal Scientific
Adviser to the Government of India
New Delhi



(K.J. Sibichan)
Deputy Secretary to the Govt. of India
Tel. No. 011-23022091

K.J. Sibichan
Head of Office
Office of the Principal Scientific Adviser
to the Government of India
New Delhi

**SUMMARY OF PERFORMANCE DATA OF XAPER at KASTURBA DRAIN
DHALLAO FROM 14/05/2020 TO 5/1/2022**

1	Number of tippers/trolleys employed for carrying input waste to the site	609 tippers(1 ton)* 3643 rickshaw(0.2 tons)*
2.	Total mixed waste INPUT	1032 M T
4	OUTPUT	175.44M T
	Combustible	92.59 MT
	Compostable	82.85 MT
CALCULATIONS:		
REDUCTION in Waste:		
	Input mixed MSW	= 1032 tons
	Output fractions of waste (Compostable + Combustible)	= 175.44 tons
	Reduction in waste quantity	=1032 – 175.44 = 856.56 tons
	% Mass reduction	= 856.56 /1032 × 100 = 83 %
INFERENCES:		
<ul style="list-style-type: none"> • >80% Mass reduction of waste • 100% diversion of waste from landfills. • No adverse environmental impacts- No methane emission and no lechate generation 		

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SUMMARY OF PERFORMANCE DATA OF XAPER at JAFRABAD TECHPARK
FROM 18/01/2022 TO 31/3/2023

1	Number of tippers/trolleys employed for carrying input waste to the site	1215 tippers(1 ton)* 3618 rickshaw(0.2 tons)*
2.	Total mixed waste INPUT	1750 M T
4	OUTPUT	389.63M T
	Combustible	215.3 MT
	Compostable	174.33 MT
CALCULATIONS:		
REDUCTION in Waste:		
	Input mixed MSW	= 1750 tons
	Output fractions of waste (Compostable + Combustible)	= 389.63 tons
	Reduction in waste quantity	=1750 – 389.63 = 1360.37 tons
	% Mass reduction	= 1360.37 /1750 × 100 = 77.7 %
INFERENCES:		
<ul style="list-style-type: none"> • >75% Mass reduction of waste • 100% diversion of waste from landfills. • No adverse environmental impacts- No methane emission and no lechate generation 		

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**Techno-feasibility report for the
project titled
'DIVERSION OF FRESH MUNICIPAL SOLID
WASTE FROM THE LANDFILL
by
Decentralized Processing
and Remediation of Ghazipur Landfill site'
by
PRINCIPAL SCIENTIFIC ADVISER
to GOI
under
'WASTE TO WEALTH' MISSION**

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Introduction

Conventional system of waste management is causing serious social and environment problems in terms of greenhouse gas emissions. Conventional system follows old practice of waste collection, transportation and dumping at landfills. With rising population and consumerism there is substantial change in waste structure. Rising incomes effect consumerism means higher waste generation with increasing quantities of plastic with organic waste.

Organic wet waste and dry waste need different treatments segregated wet waste can be used for composting or bio methnation and dry fraction can be used as energy source waste to energy or cement plants or else but it requires segregated waste restricts waste usage as resource so most of waste ends in landfills and pollutes environment for years.

In July 2019 The Prime Minister's Office (PMO) has stepped in to the problem of waste management with purpose of attaining global sustainability goals and assigns office of Principal Scientific Advisor to GOI to find authoritative answer to this question.

With the most ambitious expected outcome of zero landfill in east delhi office of PSA put global request for proposal (RFP) seeking help from global experts to grapple with the challenge posed by the country's tallest mountain of waste at the Ghazipur landfill in Delhi

The principal advisor has been entrusted with resolving the "two challenges" of the Ghazipur dump site

1. Management and treatment of the continuous flow of 2,200 tonnes of fresh waste per day and its diversion from Ghazipur landfill
2. Remediation of Ghazipur landfill

In response to RFP _____ of private companies, academia and civil society from India and abroad send their proposals.

E3 Waste Solutions a startup were selected to demonstrate and testing out technology of 'XAPER Decentralized Waste Processing System' at dhallaos at Kasturba drain and Jafrabad. XAPER installation at Kasturba drain commenced production in May-2020. Experts from Invest India pointed out some shortcomings of system and on their recommendations(Annexure-5) company makes required amendments and an amended version of XAPER installed at Jafrabad and commence its production in September-2021.

Report is prepared to assess social, environmental and financial impacts of XAPER decentralized waste processing system working at Kasturba drain dhhallo and evaluation of impacts after extensive installation of XAPER system to manage 2300 tons of waste generated in East Delhi to achieve target of 100% waste diversion of waste from Ghazipur landfill site.

More or less all of our cities are phasing similar problems so the model can be replicated for zero waste disposal.

TECHNOLOGY for decentralized waste processing

XAPER is a unique patented solution that

- Segregate mixed waste into wet/biodegradable/food waste and dry/non-biodegradable/plastic waste. It simultaneously decomposes the wet/food waste to bio-dried compostable by accelerated aerobic decomposition(AAD) in the same system
- has been designed to be installed at decentralized locations near residential area by replacing existing waste collection/material recovery facilities/transfer points (Dhallos) as space is a major constraint in tier 1 and tier 2 cities, and this will particularly help to cope-up with the challenge of waste segregation at source and address space constraints.
- XAPER waste processing system is one of its kinds, which apart from separating mixed waste is equally capable of processing segregated wet waste efficiently. The machine enjoys the distinction of lowest operational cost and least space requirement when compared with other processing technologies i.e. biomethanation, waste to energy, windrow composting etc. It segregates/processes the mixed waste into the following fractions:
 - (a) **Compostable Material:** The organic/wet/food component in the mixed waste is converted into compostable material which after the maturation of 3 weeks and screening gets converted into mature compost as prescribed by FCO standards.
 - (b) **Recyclable material:** To recover Recyclables in hygienic conditions a sorting belt is provided in the system to sort out recyclables prior to feeding in XAPER any residual recyclables emerges along with the combustible at far of the machine and can be picked up on the conveyor provided at the rear end of the system very conveniently.
 - (c) **Combustible** fraction which is basically the non-biodegradable/single-use plastics component of the mixed waste is compacted hydraulically for usage as refuse derived fuel(RDF) in cement plants, waste to energy or pyrolysis plants.

The machine employs green technology for accelerated bio drying of wet food waste to compostable. There is minimum power utilization in operating the XAPER system. There is no source of external heating to remove the moisture of the wet/food waste, instead it is the heat generated by the metabolic activities of aerobic microorganisms present in the waste which reduces moisture level and decomposition of food waste that why it is referred to as bio-drying which does neither produces harmful emissions into the environment nor any lechate percolation into the groundwater.

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It facilitates hygienic and efficient recovery of recyclables with substantial mass and volumetric reduction of the input waste after the processing. As a result, the deployment of XAPER in decentralized mode by local bodies would substantially reduce the costs involved in setting up transfer points, transportation of waste to far off landfills for ultimate disposal.

TECHNICAL DESCRIPTION

PARAMETERS	DESCRIPTION
Proposed Technology	Patented decentralized technology for Segregation, storage and processing of MSW
Concept of Technology	Incorporation of Trommel Screen(Size segregation) with Accelerated aerobic decomposer (AAD)
Segregation of waste	Not Required/Included in the system
Plant Efficiency	100% Diversion from Landfills
Land Requirement	Less than 2100 sq. ft.(200 sq. m) at any dhallao/transfer point Kasturba Dhallao- 1000 sq. ft. Jafrabad Dhallao- 1800 sq. ft.
Plant Capacity	10-50 tons per day
Plant Life	10 Years
Waste Diversion from Landfill	100%
Emission	Zero Methane and H ₂ S Emission

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Process Flow with Mass Balance Diagram for XAPER



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IMPACT of XAPER installation at KASTURBA DRAIN DHALLO

Prime objective for XAPER installation is to assess workability of technology, its impacts on surrounding, viability of operation. There was some shortcoming in Kasturba Drain Model and was amended in version 2 installed at Jafrabad (annex.4).It was observed

- Dhallao was eliminated by deploying XAPER waste processing facility
- 10 tpd capacity in a small area of 1000 sq. ft.(100 sq.mtr.)
- 614 tons of Waste diverted from land fill
- 50 MT combustible output transferred to cement /WtoE plants
- 86% reduction in input waste
- EDMC saved Rs.18 lacs on loading, transportation and dumping cost
- Eight persons employed at site
- Surrounding population is happy with dhallao elimination
- Compost produced in unit distributed and consumed by local community
- 400 tons of carbon mitigated by XAPER
- Higher recyclable recovery was observed

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**Working of XAPER:**

- **FEEDING COVEYOR:** Waste collected from household is directly drooped on slow moving feeding conveyor via tata ace, tricycle, wheel barrow or else. The incoming waste is fed on a 6 mtr long and 1.5 mtr wide slow-moving feeding conveyor which moves at a speed of 0.5 meter/minute, it can take 5 cu. mtrs. of municipal waste at a time. Tata ace carries 1 cu.mtr. So the waste of 5 tata ace vehicles on feed conveyor takes 12 minutes to reach sorting belt. It minimizes waiting time for waste collection vehicles, assures uniform feeding of waste to XAPER and hassle free recovery of recyclables.



- **SORTING BELT :** Waste from feeding conveyor slowly falls on pre sorting belt. The system provides hassle free, hygienic and efficient recovery of recyclables.

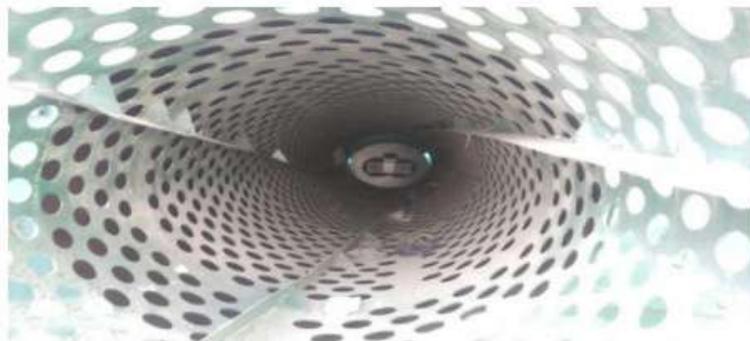
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- **TWIN SCREW FEEDER** : Waste from sorting belts falls in twin screw forced feeder. Twin screw feeder ripped-open garbage bags and feed waste to XAPER accelerated aerobic decomposer.



- **TROMMEL SCREEN** : XAPER has an inbuilt trommel screen with 80 mm holes which is provided to separate any material of above 80 mm size that is mostly non-recyclable plastics, cloth and paper, all this material falls on conveyor and transferred to hydraulic compaction system.



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- **HYDRAULIC COMPACTOR** : In the hydraulic compacter volume of fluffy plastic waste reduces by 1/5th and converted into bails for economical transfer of combustible bails to cement/WtoE/pyrolises plants.



- **ELEVATOR LIFT** : Like most of our sites east Delhi faces land scarcity. Instead of building outwards like the approach in most traditional horizontal waste processing XAPER looks to built upward .the idea is based on the fact that doing so allow you to build more within a smaller area of land. It is just impossible to have enough space for horizontal waste processing or landfills. Elevator lift is provided to transfer RDF bales or any other surplus material to first floor.



- **ACCELERATED AEROBIC DECOMPOSER** : The waste fraction of below 80 mm size that is mostly wet food waste retains in AAD(Accelerated Aerobic Decomposer). AAD is heart of XAPER waste processing system. The continuous

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tumbling action in AAD shreds the soft food/organic waste and enhances the surface area of the organic waste, baffle mechanism provided in AAD gives more than 10000 turning to wet food waste, 80 mm holes in trommel screen provides sufficient aeration which makes waste more susceptible to degradation due to accelerated microbial activity converts wet /organic waste converted into pre-finished compost within 24 hours of processing. In the process higher moisture level and organic content of reduced by more than 85% in the process. Design of system assures less than 30% loading of its volume.



- **AERATION HOLES for Bio-drying:** The system does not require any type of composting culture or dry organic material for processing, as sufficient amount of decomposing microbes are already present in the waste. Aerobic decomposition of material after exhaustion of volatile carbon inactivates the microbial activity. The metabolism heat of microbes in well aerated system through aeration holes effecting accelerated moisture removal from wet waste. Natural evaporation is bio-drying .decomposes organic waste to compost. There is neither lechate generation nor any GHG emissions during the processing. Mechanical air injector prone to clogging and are not used, bio-culture is not required, heat of metabolism evaporates moisture so external heating not required, pre shredding or manual sorting not required. AAD is most efficient composting system that takes least time comparing other available technologies. Exclusive design of AAD gives higher waste turning rate, well aerated system, soft shredding that effects in excellent aerobic decomposition of wet waste.

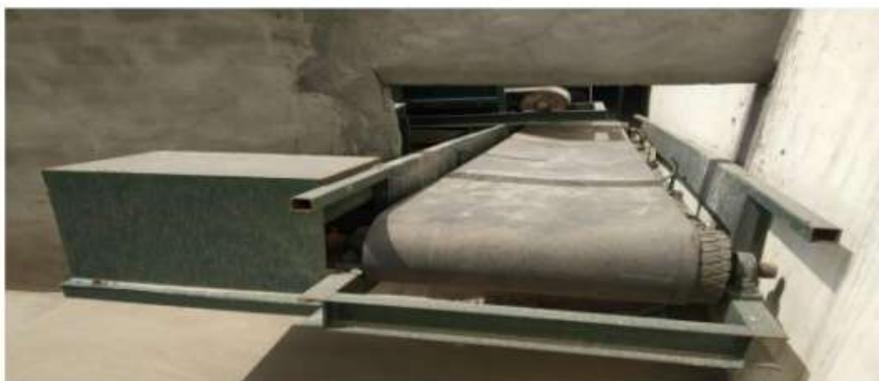


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- The pre-finished compost drops off at the far end of the outer drum which through 10 mm slits provided circumferentially on the ADD. Priming doors are provided at outlet end of AAD to extract any bio dried waste of above 10mm size before next feeding to assure empty AAD for next feeding.



- **BELT CONVEYOR:** Multiple conveyers are provided to transfer compostable material to curing zone.



- **CURING ZONE :** 3 weeks curing period is required to have FCO standard compost curing zone is divided into 4 steps to differentiate curing period of compostable. Transfer conveyor drops Bio dried compostable on first step. Compostable transferred to step two in second week and to step three on third week and finally sieved through 4mm screen on fourth step to have FCO standard compost.

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- 15-20% in the form of Combustible/RDF Bales or compost rejects left after processing. These leftovers are transferred to cement plants or waste energy plants or pyrolises plants for energy recovery. None of material is dumped in landfills.



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- **Control panel:** The system is fully automated and is controlled by an integrated control panel.



- **DE-ODORIZING SYSTEM:** De-odorizing system is installed in the premises to deal with up issue of smell on the site.

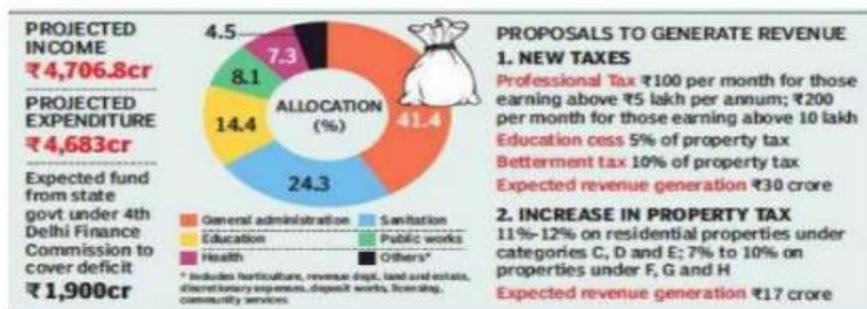


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**SOCIO-ECONOMICAL & ENVIRONMENTAL ADVANTAGES OF
XAPER WASTE PROCESSING TECHNOLOGY**

Present/earlier scenario:-

- i. Mixed waste collected from households transferred to Secondary collection /transfer points better known as 'dhallao' in Delhi.
- ii. Segregation at source remains major challenge in waste management even in developed countries. Despite all the efforts segregation at source was never achieved
- iii. There are about 300 dhallaos in East Delhi.
- iv. Dhallaos are planned on road sides for feasible loading and transportation of waste to landfill and turns to be most filthy and eye-soaring points of city.
- v. Waste pickers from unorganized sector picks up recyclables in these dhallaos in highly un-hygienic and in-human conditions.
- vi. Open waste heaps are breeding ground for vectors flies, rats, dogs etc. As per WHO, 22 types of diseases can be prevented by improving the MSW management system.
- vii. About 30 Loaders/JCBs are used to load waste in EDMC trucks from dhallaos.
- viii. About 120 trucks are used to transport waste from dhallaos to Ghazipur landfill.
- ix. 4 bull dozers and 3 excavators are employed at Ghazipur to handle waste.
- x. All these vehicles consumes about 7500 liters of diesel fuel every day
- xi. The MSW landfill located at Ghazipur is spread in 70 acre area and operating since 1984. The site reportedly had reached its planned capacity since 2002.No reparation work on the site is possible if the dumping continues.
- xii. About 200 acres additional land is required to develop sanitary land fill and waste processing facility.
- xiii. Despite all of their efforts EDMC is unable to find alternative to Ghazipur landfill.
- xiv. Diesel consumption, methane generation by anaerobic decomposition and lechate generation are major pollutants of air and ground water. The baseline scenario predict emissions of EDMC area as 6,51,393 metric tonne CO₂ equivalents in 2021
- xv. East Delhi Municipal Corporation spends almost a 25 % its annual budget on Sanitation services (Solid waste management) i.e. about Rs. 1200 cr. for 2020-21 of its Rs.4700 cr. budget is for garbage segregation, door-to-door collection and scientific disposal of daily as well as legacy waste.



DECENTRALIZED WASTE PROCESSING BY XAPER IS THE ULTIMATE SOLUTION FOR WASTE PROCESSING, TRANSPORTATION AND DISPOSAL IN ECO-FRIENDLY MANNER

Course of Action

- XAPER are available in capacity range of 10TPD to 50 TPD.
- 46 to 220 numbers of XAPERs are required to process 2300 tons of mixed MSW generated in East Delhi.
- 200 to 350 sq. mtr. Space is required to for installation of a XAPER unit.
- Kasturba drain and Jafrabad dhallaao model should be replicated for installation of XAPER units of required capacity at various dhallaos sites across East Delhi.
- EDMC will provide mixed MSW at XAPER site and operator shall be responsible for processing, transportation and eco-friendly disposal of outputs.
- XAPER segregates waste ,dries wet waste, reduces mass & volume by more than 80%(Annexure 1)
- Capital outlay of Rs.185-375 cr. is required to set up XAPERS to manage 2300 tons of MSW generated in EDMC area. (Annexure-4)
- Operational and maintenance cost to manage 2300 tons will varies between Rs.80 cr/year to Rs.115 cr./yr.(Annexure-4)

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SOCIAL IMPACT

- Dhallaos, the eye soaring black spots across the city will be eliminated
- 22 types of diseases can be prevented by improving the MSW management system.
- 100% diversion of waste from Ghazipur landfill
- Scientific and techno-feasible approach toward zero waste city
- Hygienic and Socially dignified working conditions for the un-organized workforce of waste-pickers.
- Realignment of unorganized sector : After each XAPER installation, 10 people get direct employment
- Replicating Kasturba drain model to process 2300 tons of waste generated in east Delhi will give direct employment to 2500 downtrodden persons and will integrate them in the mainstream workforce.
- Additional land for waste processing and Sanitary land fill (SLF) will not require.
- Prevention of water pollution caused by leachate.
- Reduced congestion on roads caused by trucks carrying waste to landfill
- Reduced air pollution caused by vehicles, methane, waste burning and other GHG.
- Remediation of Ghazipur land fill shall be feasible once waste is completely diverted from site.
- Challenge of segregation at source will be overcome by mechanical segregation of waste near the source of waste generation.
- Organic compost and bio-dried fuel from waste will be available
- Energy potential of RDF(non-recyclables etc) can be explored
- It is difficult to plan MSW management considering long term planning horizon of 20-25 years. Long term planning enhance land requirement, processing capacity and capital expenditure for centralized waste processing facility while XAPER decentralized waste processing system is modular that gives flexibility for expansion as per requirement.
- Frequent breakdown of processing facilities is major glitch in waste processing while multiple decentralized XAPER will facilitate waste processing in surroundings in case of any breakdown in a unit.

ENVIRONMENTAL IMPACT

- 500000 tons of carbon will be mitigated by XAPER decentralized waste processing
- Ground water pollution caused by leachate percolation will be prevented.
- Plastic waste which is considered as a threat to environment will be used as energy source.
- Higher moisture in the range of 60-90% is major cause of concern in waste management because of which there is
 - i. Leachate generation
 - ii. Emission of Green house gases like methane etc and foul smelling hydrogen sulfide due to anaerobic decomposition of waste
 - iii. Higher moisture levels and unpredictable composition of mixed MSW restricts combustion of MSW in waste to energy plants.
 - iv. In fact waste transporting vehicles mostly carries water in the form of moisture in waste.

Bio drying by XAPER reduces moisture to 30% from 90% in wet food waste. Energy content of bio dried organic waste is around 3000 kcal and of combustibles non recyclables separated in bales have energy contents of more than 6000 kcal so output can replace fossil fuels in cement plants, waste to energy plants or shall be further processed by torrefaction and pyrolyses to boost its fuel values.

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FINANCIAL IMPACT

- EDMC spent a quarter of its budget that is Rs.1200 cr. annually on sanitation that it spends the money on collection, transportation and dumping of waste to Ghazipur landfill.
- EDMC needs 200 acres of land to develop SLF and waste processing facilities estimated to cost Rs.4000 crore.
- It requires Rs.185-375 Cr.(A-3-4) CAPEX to establish XAPERs for management of 2300 tons of MSW generated in East Delhi that is 4-8% of annual budget of EDMC
- It requires 1-2% of their Rs.4700 cr. annual budget that is 80-115 Cr. (A-3-4) for operation and maintenance of multiple decentralized XAPER waste processing facilities that includes maintenance of dhallaos, O&M of XAPER systems, loading, transportation and disposal of output ,100 % diversion of waste from Ghazipur land fill.

By adapting decentralized XAPER waste management facilities EDMC will

- Save major part of Rs. 1200 Cr. spending on sanitation
- Avoid expenses of Rs. 4000 Cr. required for the development of SLF and waste processing facilities.
- Reclaim land of Ghazipur valued around Rs.2000 Cr.
- Earn more than Rs.35 cr. by trading carbon credits for 500000 tons carbon mitigated by XAPERs.

Overall EDMC by making an expenditure of Rs 1300-Rs.1900 Cr. on CAPEX and OPEX on decentralized XAPAR facilities EDMC can save more than Rs. 10000 Cr. in ten years that is life span of system. Saving can be used in more effective way on public welfare.

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Anexture-1(A)SUMMARY OF PERFORMANCE DATA OF XAPER at KASTURBA
DHALLAQ FROM 13/4/2020 TO 5/1/2022

From the period of 13th April 2020 to 5/1/2022, it was observed that a total of **609 tippers and 3643 rickshaws** were used to deliver **1032 MT** of mixed waste at XAPER site and **only 24 vehicles trips** were used to carry away **92.59 MT** of output from the site to cement plants and **52.2 MT** to Ghazipur WtE plant. There was **85.97% reduction of input waste in mass terms resulting in substantial reduction in the number of vehicles** which transported the rejects to cement plants and Ghazipur WtE plants. The details are as given in the tables below:

1	Number of tippers/trolleys employed for carrying input waste to the site	609 tippers(0.5 tons)* 3643 rickshaw(0.2 tons)*
2.	Total mixed waste INPUT	1032 M T
4	OUTPUT (Combustible + Compostable)	144.79M T
CALCULATIONS:		
REDUCTION in Waste:		
	Input mixed MSW	= 1032 tons
	Output fractions of waste (Compostable + Combustible)	= 144.79 tons
	Reduction in waste quantity	=1032 – 144.79 = 887.21 tons
	% Mass reduction	= 887.21/1032 × 100 =85.96%
INFERENCES:		
<ul style="list-style-type: none"> • 85% Mass reduction of waste • 100% diversion of waste from landfills. • No adverse environmental impacts- No methane emission and no lechate generation 		

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Anexture-1(B)SUMMARY OF PERFORMANCE DATA OF XAPER at JAFRABAD TECHPARK
FROM 18/1/2022 TO 9/6/2022

From the period of 18/1/2022 to 5/1/2022, it was observed that a total of **67 tippers and 488 rickshaws** were used to deliver **164.6 MT** of mixed waste at XAPER site and **11.52 MT** of combustible output from the site to Plasma and gasification units installed in Jafrabad TechPark and 18.11 MT of Compostable was obtained. There was **82.01% reduction of input waste in mass terms resulting in substantial reduction in the number of vehicles** and divert 100% waste from landfill. The details are as given in the tables below:

1	Number of tippers/trolleys employed for carrying input waste to the site	67 tippers(1 ton)* 488 rickshaw(0.2 tons)*
2.	Total mixed waste INPUT	164.6 M T
4	OUTPUT	29.62M T
	Combustible	11.52 MT
	Compostable	18.11 MT
CALCULATIONS:		
REDUCTION in Waste:		
	Input mixed MSW	= 164.6 tons
	Output fractions of waste (Compostable + Combustible)	= 29.62 tons
	Reduction in waste quantity	=164.6 – 29.62 = 134.98 tons
	% Mass reduction	= 134.98 /164.6 × 100 = 82.01 %
INFERENCES:		
	<ul style="list-style-type: none"> • 80% Mass reduction of waste • 100% diversion of waste from landfills. • No adverse environmental impacts- No methane emission and no lechate generation 	

Annexure 2Table 3.6: Summary of Different Composting Technologies²⁰

PARAMETERS	WINDROW	AERATED STATIC PILE	IN-VESSEL	VERMICOMPOSTING
General	Simple technology for large scale application	Effective for farm and municipal use	Large-scale systems for commercial applications	Small scale
Amount of input waste per day to be treated	1-500 tonnes	1-500 tonnes	1-300 tonnes	upto 50 tonnes
Land requirement	8 ha for 500 TPD including buffer zones	5 ha for 500 TPD (Less land required given faster rates and effective pile volumes)	4 ha for 500 TPD (Limited land due to rapid rates)	2 ha for 50 TPD
Time	8 weeks	5 weeks	4 weeks (3-5 days in vessel; 3 weeks to mature)	8 -10 weeks
Ambient temperature	Not temperature sensitive	Not temperature sensitive	Not temperature sensitive	Temperature sensitive (20°C-40°C ideal range, maximum 40°C)
Energy input	Moderate	Moderate (2-3 hours aeration)	High	Low
Financial implications	Moderate	Costly	Very costly	Moderate but purchase of exotic earthworms suitable for MSW vermicomposting are expensive
Odour and aesthetic issues	Odour is an issue if turning is inadequate	Moderate but controls can be used such as pile insulation and filters on air system	Minimum due to equipment failure or system design failure	None

Source : MSW management manual-2016

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Annexure 6

Recommendations	Photographs from KasturbaDrain site	Amendments at Jafrabad dhallo	Photographs from Jafrabad Dhallo site
<p>a) Automation like conveyor belt can be installed to reduce human interventions at inlet.</p> <p>b) At outlet point, there can be some automated system by which compostable can be separated and compressed automatically.</p> <p>c) If automation process is not feasible, please provide proper safety equipment's like PPE kit, gloves, shoes, helmet etc. for the safety of sanitation workers.</p> <p>d) At inlet, there was heap of waste; site team confirmed that by evening before concluding for the day, there will be no waste left un-processed and will ensure plant is</p>	   	<p>Figure 1 - Slow-moving MSW Feeding Conveyor: This conveyor is installed to create a buffer zone for the waste before it enters the system, which not only prevent the littering of waste on site but also reduces the pressure on the machine to ensure smooth running of machine and avoiding breakdowns due to the same.</p> <p>Figure 2 – Recyclable Receptacle: This area is provided for storage as well as avoid littering of recyclables while working on site.</p> <p>Figure 3- Recyclable-sorting conveyor: This conveyor is installed to ease the rag-pickers for better</p>	   <p>Figure 1</p> <p>Figure 2</p> <p>Figure 2</p>

<p>clean.</p> <p>e) Proper storage for curing & drying processed organic waste may be planned. As per site team, organic waste will be shifted on roof with proper shed to have space for storing compostable waste.</p>		<p>recovery of recyclables</p> <p>Figure 4- Conveyor for RDF/Combustible is provided to automatically transfer the</p>	  <p>Figure 4 Figure 5</p>
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20th February 2023

To Whomsoever It May Concern

This is to certify that M/s E3 Waste Solutions (now XAPER Waste Solutions Pvt. Ltd), Jalandhar, Punjab was selected through a global RFP floated in July 2019 for the project "***Diversification of Fresh Municipal Solid Waste (MSW) from the Landfill by Decentralized Processing and Remediation of Ghazipur Landfill Site***" of the Waste to Wealth Mission of the Office of the Principal Scientific Adviser to the Government of India.

Under the project, M/s E3 Waste Solutions, installed two units of 10 tons per day capacity each at following locations:

- Kasturba dhalao, Vishwas Nagar, East Delhi.
- Decentralized Waste Management Technology Park, New Jafrabad, East Delhi

The XAPER unit at Kasturba dhalao was installed in February 2020. During the period May 2020 - December 2021, 1032 metric tons of fresh mixed municipal waste was diverted from landfill and processed onsite by this unit.

The unit at Decentralized Waste Management Technology Park, New Jafrabad, East Delhi was installed in May 2021 and has been in operation since April 2022. During the period April - December 2022, 1,222 metric tons of fresh mixed municipal waste was diverted from landfill and processed onsite by this unit.

During its operation, the technology performance was reviewed by a committee of experts appointed by the Office of Principal Scientific Adviser to GoI. The committee observed that the XAPER technology is a compact waste segregation system which can be installed at decentralized locations near residential areas by replacing existing waste collection/dumping points (dhalaos), particularly for areas where segregation is a challenge and there are space constraints. Both units at Kasturba dhalao and Decentralized Waste Management Technology Park, New Jafrabad have been observed to satisfactorily segregate fresh mixed waste into wet/biodegradable waste and dry/non-biodegradable/plastic waste.

Diverting waste from landfills by decentralized waste processing will enable resource recovery from waste, reduce pollution and help urban local bodies to fulfil their waste management goals and save substantial costs in collection, transportation, and disposal of municipal solid waste.



Dr. Monoranjan Mohanty
Adviser / Scientist 'G'

Office of the Principal Scientific Adviser
to the Government of India

Annexure 9

Waste Processing Data

S. No.	Waste Processing Site	Quantity of Waste Processed
1.	Kasturba Drain Dhallao, Vishwas Nagar, EDMC	1032 tons
2.	Jafrabad TechPark, EDMC	1750 tons
3.	Rail Coach Factory Kapurthala	3481 tons
4.	Delhi Cantonment Board	1668 tons
5.	Cantonment Board Ambala	810 tons
6.	Biswanath Municipal Corporation, Assam	682 tons
	TOTAL	9423 tons

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Telephone: 25693837

No. DCB/32/SN-1/2017-18
Office of the Delhi Cantonment Board
Delhi Cantonment-110010.

Dated: 25 July, 2018

To,
M/s Palta Engineering works
Pvt. Ltd. S-137, Industrial Area
Jalandhar, (Punjab).

SUB: Proposal for Installation of Technology Demonstration Unit in Delhi Cantt.

1. Reference the subject proposal forwarded to this office vide your letter No. Nil dated 13.06.2018.
2. It is intimated that concurrence has been given by the Delhi Cantonment Board for your proposal. You are accordingly requested to plan for the installation of XAPER of 10TPD capacity at Kirby Place, Delhi Cantt at the earliest. Please direct your company representative to visit and confirm the exact location for the setting up of the machine and seeking any further clarification in this matter.
3. It is reiterated that the installation of the Sorting cum Composting Machine would be guided by the following terms and conditions:-
 - (a) 'No Cost No Commitment' basis .
 - (b) Setting up will be completed within 30 days and the machine will be tested for a period of 60 days after installation.
 - (c) The space for installation and the associated power expenses for running the machine will be provisioned by DCB, at Kirby Place.
 - (d) In the event of successful performance by the technology demonstrator, the Delhi Cantonment Board will float tender for machines of the said technology through an open tender system.

(Authority: CBR No. 12 dated. 17.07.2018).


Col P.K Dogra (Retd.)
Consultant(s)
For Chief Executive Officer
Delhi Cantonment Board

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It was observed that a total of 70 vehicles trips were used to deliver 122.55 MT of waste at XAPER site and only 13 vehicles were used to carry away 34.14 MT of rejects from the site to Okhla land fill. There was 72% reduction of input waste in mass terms and 76.5% volumetric reduction in the number of vehicles which transported the rejects to Okhla landfill. The details are tabulated below:

Incoming input mixed waste				Outgoing Rejects to landfill		
Date	Number of vehicles	Weight (in tons)	Recyclables	Date	Number of vehicles	Weight (in tons)
16/11/2018	4	7.25		16/11/2018		
17/11/2018	2	3.8				
19/11/2018	4	6.8				
20/11/2018	6	9.87				
21/11/2018	5	8.32		21/11/2018	4	6.78
22/11/2018	5	13.83				
27/11/2018	7	17.62		27/11/2018	3	9.7
30/11/2018	4	7.4				
1/12/2018	5	8.5				
3/12/2018	5	6.46		3/12/2018	4	13.8
6/12/2018	13	6.8				
7/12/2018	3	1.35				
8/12/2018	3	1.35	16 kg			
10/12/2018	7	3.2	18 kg			
11/12/2018	7	3.2	20 kg			
12/12/2018	8	3.6	20 kg	12/12/2018	2	3.86
13/12/2018	6	2.8	51 kg			
14/12/2018	10	5				
15/12/2018	12	5.4				
Total Vehicles	47 ^a + 23 ^b = 70	122.55		Total	13	34.14

Note :

- From 16th November 2018 to 3rd December 2018, TATA 1613 tippers were used for carrying the weighed input waste to the site.
- From 5th December 2018 to 15th December 2018 TATA Ace of carrying capacity 450 kg were used for carrying input waste. The waste carried by these has been converted into equivalent TATA tippers of carrying capacity of 1.4 MT (which is converted to tipper by calculation i.e. total input waste divided by 1.4).

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**SUMMARY OF PERFORMANCE DATA FOR XAPER PROTOTYPE. FROM
16/11/2018 TO 15/12/2018**

Number of tippers to site	70
Waste Input	122.55 tons
Average waste per tipper	1.75 ton/tipper
Outgoing rejects to land fill	34.14 ton
Number of tippers carrying waste to landfill	13
Average waste per tipper to landfill	2.6 ton tipper
Meter Reading as on 15/11/18	2472
Meter Reading as on 12/12/18	4285
Power consumption	1813 units
Power consume for every ton waste processing	14.79 units/Ton
Cost of power @ Rs.9/unit	Rs.133/- per ton
Estimated Cost of transportation 70 tippers to landfill	Rs.2,80,000/-
Cost of actual transportation of 13 Tippers to Landfill	Rs.52,000/-
Saving in Transportation cost	Rs.2,28,000/-
Saving on every ton of waste processed (2,28,000/122.55)	Rs.1860/-per ton
Expected savings if rejects processed at site	Rs.228000/-
Saving on every ton of waste processed (Rs.228000/122.55)	Rs.1860/- per ton
Value of rejects @Rs.200/ton (Rs.200*34.14)	Rs.6828/-



दिल्ली 99 परिषद
Delhi Cantonment Board
सदरबाजार, दिल्ली छावनी - 10
Sadar Bazar, Delhi Cantt - 10.
Tel. No. : 25693837, 25695450
Email : ceodelhicantt@gmail.com
Website : www.ebdelhi.in



No.DCB/32/SN-1/2018

Dated 02nd Jan, 2019

To,

1. Lt. Col. B.K Singh, SO (Cantt) - Chairman
2. Lt. Col. Rajesh Juyal, GE Project (East) -Member
3. Smt. Priyanka Chaudhary - Member
4. Sh. Sandeep Tanwar -- Member
5. Sh. Sachin Kumar, JE (E&M)
6. Sh. Nishant, ASI

**VALIDATION OF 'SORTING-CUM-COMPOSTING' TECHNOLOGY
INCORPORATED IN XAPER PROTOTYPE MACHINE, INSTALLED
BY M/S. PALTA ENGINEERING WORKS PVT. LTD AT KIRBY PLACE.**

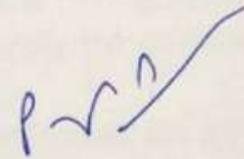
1. Palta Engineering Works Pvt. Ltd, pursuant to their proposal which was approved vide CBR No. 12 dated 17.7.2018, installed the prototype of XAPER Machine at Kirby Place in the last week of September 2018. The technology used in the machine provides the capability to efficiently handle all categories of waste /garbage i.e (i) unsegregated mixed garbage, (ii) segregated wet waste and (iii) segregated dry waste. The machine has been operating at its optimal designed capacity for the last one month during which the Company has generated data, through actual measurements, regarding power consumption, volumetric and mass reduction of the input waste, analysis of various output fractions, and overall cost/savings for DCB.

2. Vide CBR No. 17 dated 20.12.2018, It was proposed to conduct a formal validation of the above technology through a committee. Accordingly, it has been decided to setup the committee comprising the members, as given below. The aspects of evaluation are attached herewith as Appendix 'A'.

- (a) Lt. Col. B.K Singh, SO (Cantt) - Chairman
- (b) Lt. Col. Rajesh Juyal, GE Project (East) -Member
- (c) Smt. Priyanka Chaudhary - Member
- (d) Sh. Sandeep Tanwar - Member
- (e) Sh. Sachin Kumar, JE (E&M)
- (f) Sh. Nishant, ASI

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3. M/s Palta Engineering Works Pvt. Ltd, vide their E-mail dated 18.12.2018, have submitted the performance report of XAPER w.e.f 15.11.2018 to 15.12.2018, during which period the machine was subjected to calibrated testing. The brief details of the production/ commercial model of the machine, which has been named as XAPER Mark 2.0, have also been enumerated. The company representatives would be available to explain all the details of the technology and the data generated during the test period, including demonstration, w.e.f 03.01.2019.
4. The committee is requested to submit its report by 14.01.2019.



Chief Executive Officer
Delhi Cantonment Board
(Puspendra Singh)

Aspects for evaluation by the Validation Committee

The Validation Committee is requested to evaluate the technology covering the following aspects:-

- (a) Appropriateness of the technology and confirmation of the segregation of waste into various fractions. The committee will also identify the components getting segregated.
- (b) Analytical comments on the suitability of the technology for garbage handled by Cantonment Board.
- (c) Validation of the performance data presented by M/s Palta Engineering Works Pvt. Ltd. In consultation with Sanitation and MT Section of DCB.
- (d) Carry out the cost analysis of the machine(XAPER) operation, including the likely saving in terms of labour and transportation cost for DCB.
- (e) Suggest further modifications, if any, in the prototype of the machine which may be adopted in the production version.
- (f) Give recommendations for the adoption of (XAPER) technology by DCB for processing of the complete quantity of approximately 62 MT solid waste, generated on daily basis in Delhi Cantonment Area.
- (g) Critically analyse the "Zero Waste Model" proposed for Delhi Cantt, by the Company, based on deployment of XAPER Machines, duly supplemented by centralized Waste to Fuel (WTF) facility proposed to be set-up 'free of cost' by the company.
- (h) Any other inputs the committee may like to furnish.

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**REPORT OF THE VALIDATION COMMITTEE
CONSTITUTED BY DELHI CANTONMENT
BOARD
FOR THE EVALUATION OF

'SORTING-CUM-COMPOSTING' TECHNOLOGY
INCORPORATED IN XAPER PROTOTYPE
MACHINE,
INSTALLED BY
M/S PALTA ENGINEERING WORKS PVT. LTD
AT KIRBY PLACE, DELHI CANTONMENT**

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CONVENING ORDER

Palta Engineering Works Pvt. Ltd, pursuant to their proposal which was approved vide CBR No. 12 dated 17-07-2018, installed the prototype of XAPER machine at Kirby Place in the last week of September 2018. The technology used in the machine provides the capability to efficiently handle all categories of waste/garbage i.e. un-segregated/mixed municipal solid waste, segregated wet waste and segregated dry waste. The machine has been operating at its optimal capacity from last one month during which the company has generated data, through actual measurements, regarding power consumption, volume and mass reduction of the input waste, analysis of various output fractions, and overall cost/savings for DCB.

Vide CBR No. 17 dated 20-12-2018, it was proposed to conduct a formal validation of the above technology through a committee. Accordingly, it has been decided to setup the committee comprising the members as given below. The aspects of evaluation are attached herewith as Appendix 'A'

- a) Lt. Col. B.K. Singh, SO (Cantt) – Chairman
- b) Lt. Col. Rajesh Juyal, GE Project(East)- Member
- c) Smt. Priyanka Chaudhary- Member
- d) Sh. Sandeep Tanwar- Member
- e) Sh. Sachin Kumar, JE (E&M) – Member
- f) Sh. Nishant, ASI – Member

M/s Palta Engineering Works Pvt. Ltd vide their E-mail dated 18-12-2018, have submitted the performance report of XAPER w.e.f 15-11-2018 to 15-12-2018, during which period the machine was subjected to calibrated testing. The brief details of the production/commercial model of the machine, which has been named as XAPER Mark 2.0, have also been enumerated. The company representatives would be available to explain all the details of the technology and the data generated during the test period, including demonstration, w.e.f 03-01-2019.

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TERMS OF REFERENCE

Aspects for evaluation by the Validation Committee

The validation committee is requested to evaluate the technology covering the following aspects:-

- a) Appropriateness of the technology and confirmation of the segregation of waste into various fractions. The committee will also identify the components getting segregated.
- b) Analytical comments on the suitability of the technology for garbage handled by Cantonment Board.
- c) Validation of the performance data presented by the company in consultation with sanitation and MT section of DCB.
- d) Carry out the cost analysis of the machine XAPER operation, including the likely saving in terms of labour and transportation cost for DCB.
- e) Suggest further modifications, if any, in the prototype of the machine which may be adopted in the production version.
- f) Give recommendations for the adoption of XAPER technology by DCB for processing of the complete quantity of approximately 62 MT solid waste, generated on daily basis in Delhi Cantonment Area.
- g) Critically analyze the 'Zero Waste Model' proposed for Delhi Cantonment, by the company, based on deployment of XAPER machines, duly supplemented by centralize waste to fuel (WtF) facility proposed to be set up 'free of cost' by the company.
- h) Any other inputs the committee may like to furnish.

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COMPOSITION OF VALIDATION COMMITTEE

S.No.	Name	Designation	Signature
1.	Lt. Col. B.K. Singh	SO (Cantt), Station Headquarters, Delhi Cantt	
2.*	Major Kuldeep Kumar	GE Project (East)	
3.	Smt. Priyanka Chaudhary	Member, DCB	
4.	Sh. Sandeep Tanwar	Member, DCB	
6.	Sh. Sachin Kumar	JE (E&M), DCB	
7.	Sh. Nishant	ASI, DCB	

*Appointed consequent to the posting out of Lt. Col. Rajesh Juyal (who was earlier appointed vide the convening order).

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COPY OF E-MAIL**Request Mail for Formal Evaluation of XAPER prototype at Kirby Place**

3 messages

Xaper tech <xaperinfo@gmail.com>

18 December 2018 at 18:58

To: Chief Executive Officer Delhi Cantt <ceodelhicantt@gmail.com>

Respected Sir,

1. At the very outset, I wish to express our deep gratitude to DCB for having afforded us the opportunity to demonstrate our technology incorporated in the prototype of 'XAPER- Sorting cum composting machine' installed at Kirby Place in Delhi Cantonment. We are also grateful for the interaction which we had with the official of DCB leading to certain modifications of the prototype as well as those which have been conceived to be implemented in the actual production model i.e. XAPER Mark 2.0
2. The prototype of XAPER of 10 TPD capacity has been functional from 23rd September 2018. The prototype, which had been extensively exploited for a period of year and half at various other locations, required a settling down period and few repairs. Thereafter upto end October, XAPER prototype was subjected to various types of trials and modifications, which included the changeover from conveyer to vertical lift based feeding system, addition of a new conveyer belt for the compostable material, replacement of rotating ring and realignment of the conveyer for the combustibles. With effect from 1st week of November 2018, the prototype was being operated at its optimal designed capacity. Accordingly, DCB was requested to provide weighed mixed waste at the XAPER site and also keep a record of the processed waste sent to the landfill. The same was put into effect by DCB w.e.f 15th November 2018. The vehicles carrying input waste to the site were routed through Mayapuri, for the purpose weighing at our expense, before being unloaded in the input enclosure at site. Likewise, sanitation branch of DCB has documented the details of waste rejects which were transported from the site to Okhla and have shared the same with us. We have also kept the record of metered power consumption on a daily basis to arrive at the operational data.
3. With the kind help extended to us by DCB, we have been able to carry out critical analysis of the operation of XAPER to generate a vast range of data in terms of volumetric and mass reduction from input to output, power consumption for per MT of processing, overall cost analysis and daily savings to DCB in terms of transportation and labour. The same is given at Appendix and is enclosed in the form of attachment.
4. At this juncture, we wish to humbly request you to kindly carry out the formal validation of our technology and give us the opportunity to realize our dream of zero waste model for Delhi

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Cantonment. We are confident that we will be able to deliver XAPER mark 2.0 in various configurations on a 'Turnkey basis', as a part of our overall 'Zero Waste Model' for Delhi Cantonment which would encompass the setting up of a centralized waste to fuel facility, free of cost by M/s Palta Engineering Works Pvt. Ltd. However, land measuring 100 m × 30 m would be required to be provided by DCB on a nominal lease rent. We would also like to offer purchasing the entire output at Rs 200 per MT, from all the XAPER machines which may be installed in Delhi Cantonment in due course of time. This obviously would generate a revenue of approximately Rs. 4500 per day to DCB.

The entire details of the Zero Waste Model for DCB will be sent shortly.

Thanking You

With Profound Regards and Best Wishes,
Ajay Palta

Director

Palta Engineering Works Pvt. Ltd

S-137, Industrial Area, Jalandhar

Punjab-144004, INDIA

M:+91-9872900042

xapertech@gmail.com

xaperinfo@gmail.com

2 attachments

 **Covering Letter for Evaluation of XAPER.doc**
54K

 **XAPER Performance Report.doc**
191K

PROCEEDINGS OF VALIDATION COMMITTEE**General**

1. Palta Engineering Works Pvt. Ltd, pursuant to their proposal which was approved vide CBR No. 12 dated 17-07-2018(copy at Annexure I), installed the prototype of XAPER machine at Kirby Place in the last week of September 2018. The prototype of XAPER of 10 TPD capacity was made functional from 23rd September 2018. The prototype, which had been extensively exploited for a period of year and half at various other locations prior to its installation at Kirby place, required a settling down period and also a few repairs which were carried out in situ.
2. Thereafter, up to end October, XAPER prototype was subjected to various types of trials and modifications for process optimization. These included the changeover from conveyer to vertical lift based feeding system, addition of a new conveyer belt for the compostable material, replacement of rotating ring and the realignment of the conveyer for the combustibles.
3. With effect from 1st week of November 2018, the prototype was being operated at its optimal designed capacity. Accordingly, DCB was requested to provide weighed mixed waste at the XAPER site and also keep a record of the processed waste sent to the landfill. The same was put into effect by DCB w.e.f 15th November 2018 for duration of one month i.e up to 14th December 2018. The vehicles carrying input waste to the site were routed through Mayapuri, for the purpose weighing at company's expense, before being unloaded in the input enclosure at site. Likewise, the Sanitation branch of DCB had documented the details of the non-biodegradable waste (non recyclables/combustibles) segregated by the Machine, which were transported from the site to Okhla .The same were presented to the Validation Committee. The record of daily consumption of power was also kept. The average power consumed per ton of waste processing, over the trial period of 30 days was calculated and verified from the documents maintained by the company.
4. Meetings of the Validation Committee: A total five meetings were conducted for the validation committee members by the company. Large number of issues pertaining to the genesis of technology, its suitability for adoption by DCB and the associated cost benefits/savings were discussed. The brief Minutes of Meetings are given at Appendix A.

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PERFORMANCE REPORT OF XAPER FOR THE TRIAL PERIOD FROM 16th NOVEMBER TO 15th DECEMBER

5. XAPER, a three-in-one patented technology, is capable of handling mixed waste, segregated wet waste as well as segregated non-biodegradable waste by a single machine. It has been designed to be used in a decentralized mode, particularly for areas where segregation is a challenge or there are space constraints. The machine is only one of its kind, which besides processing the mixed waste is equally capable of processing segregated wet/dry waste efficiently. The machine enjoys the distinction of lowest operational cost and least space requirement when compared with other processing technologies. It segregates/processes the mixed waste into the following fractions:

- (a) Compostable Material: The organic component in the mixed waste is converted into compostable material which after the maturation of 3-4 weeks gets converted into mature compost.
- (b) Recyclable material: This emerges along with the combustible at far of the machine and can be picked up very conveniently.
- (c) Combustible fraction which is basically the non-biodegradable component of the mixed waste.
- (d) Inert fractions: This basically referred as C&D waste and other inert material.

6. The machine employs green technology. There are no harmful emissions into the environment and there is no leachate percolation into the ground. It facilitates hygienic and efficient recovery of recyclables with substantial mass and volumetric reduction of the input waste after the processing. In effect, the employment of XAPER in decentralized mode by municipalities would substantially reduce the costs involved in setting up transfer points, transportation of waste to far off waste to energy plants or landfills for ultimate disposal.

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Technical Specifications	
Capacity (Mixed Waste)	10 tons per day
Capacity (Segregated Wet/Dry Waste)	5 tons per day
Population it can serve	25,000
Space Requirement	12m. x 5 m.
Height	11.6 ft.
Feeder ht.	6 ft
Power Requirement	3-phase, 10 kw
Daily Power consumption	100 units/ day
Monthly Power consumption	3000 units/ month
Man power*	4 (1 skilled; 2 unskilled; 1 ragpicker)
*Man power required for waste loading, replacing compost box and for sorting recyclables etc.	

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7. **Principle of operation:** It is based on time-tested technology of size separation and mechanical biological treatment (MBT). The system is an incorporation two different technologies namely **Trommel Screening and In-Vessel Composting** in one single system in the form of concentric drums. The machine is compact enough to be installed at decentralized locations where the waste can be stored and processed simultaneously. Both the technologies are recommended by the MSWM manual 2014 for processing the waste. Trommel screen i.e. inner drum segregates the waste fraction into non-biodegradable (>100mm size) and biodegradable (<100 mm size). The mechanically tumbling of in-vessel composter i.e. outer drum facilitates aerobic decomposition of organic fraction to compost.

8. **Process Flow Diagram for XAPER**



9. **Working of XAPER:**

(a) Waste collected from household can be directly fed into hopper feeder manually or with mechanical lift loader into XAPER. The waste fraction of below 100 mm falls through the holes of 100 mm size in the inner drum which is mostly wet organic waste. The same is retained in the outer bio-digester of XAPER for further aerobic decomposition. The non-biodegradable fraction which are of the size above 100 mm such as paper, plastic bags, boxes etc. remains in the inner drum and gradually come out from the other end due to the tumbling action of the drum. The recyclables also fall off at the far end on the slow-moving conveyer belt and hence can be easily picked up by the rag-pickers.

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(b) The continuous tumbling action in XAPER shreds the soft food/organic waste and enhances the surface area of the organic waste and provides sufficient aeration which makes it more susceptible to degradation due to accelerated microbial activity and the wet/organic waste is converted into pre-finished compost within 24 hours of processing. The pre-finished compost drops off at the far end of the outer drum which has 12 mm slits circumferentially on the conveyer provided for the purpose in the machine which further requires a curing period of 21 days to be used as commercial compost. The intermediate fraction of waste (12-100 mm size) can be extracted from other end on completion of processing during the priming stage.

(c) The system does not require any type of composting culture or dry organic material for processing, as sufficient amount of decomposing microbes are already present in the waste. Aerobic decomposition of material after exhaustion of volatile carbon inactivates the microbial activity. The metabolism heat of microbes facilitates moisture removal from wet waste facilitating bio-drying (moisture removal) and decomposes organic waste to compost. There is neither leachate generation nor any GHG emissions during the processing.

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ASSESSMENT OF THE PERFORMANCE OF XAPER PROTOTYPE

10. It was observed that a total of **70 vehicles trips** were used to deliver **122.55 MT** of waste at XAPER site and **only 13 vehicles trips** were used to carry away **34.14 MT** of rejects from the site to Okhla land fill. There was **72% reduction of input waste in mass terms and 76.5% volumetric reduction in the number of vehicles** which transported the rejects to Okhla landfill. The details are as given in the tables below:

Table 1

Incoming input mixed waste				Outgoing Rejects to landfill		
Date	Number of vehicles	Weight (in tons)	Recyclables	Date	Number of vehicles	Weight (in tons)
16/11/2018	4	7.25		16/11/2018		
17/11/2018	2	3.8				
19/11/2018	4	6.8				
20/11/2018	6	9.87				
21/11/2018	5	8.32		21/11/2018	4	6.78
22/11/2018	5	13.83				
27/11/2018	7	17.62		27/11/2018	3	9.7
30/11/2018	4	7.4				
1/12/2018	5	8.5				
3/12/2018	5	6.46		3/12/2018	4	13.8
6/12/2018	13	6.8				
7/12/2018	3	1.35				
8/12/2018	3	1.35	16 kg			
10/12/2018	7	3.2	18 kg			
11/12/2018	7	3.2	20 kg			
12/12/2018	8	3.6	20 kg	12/12/2018	2	3.86
13/12/2018	6	2.8	51 kg			
14/12/2018	10	5				
15/12/2018	12	5.4				
Total Vehicles	47 ^a + 23 ^b = 70	122.55		Total	13	34.14

Note :

- From 16th November 2018 to 3rd December 2018, TATA 1613 tippers were used for carrying the weighed input waste to the site.
- From 5th December 2018 to 15th December 2018 TATA Ace of carrying capacity 450 kg were used for carrying input waste. The waste carried by these has been converted into equivalent TATA tippers of carrying capacity of 1.4 MT (which is converted to tipper by calculation i.e. total input waste divided by 1.4).

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**SUMMARY OF PERFORMANCE DATA FOR XAPER PROTOTYPE. FROM
16/11/2018 TO 15/12/2018**

1	Number of tippers employed for carrying input waste to the site	70
2	Total Waste Input	122.55 tons
3	Average waste per tipper (2/1)	1.75 tons
4	Quantity of Non-Recyclables sent to land fill	34.14 tons
5	Number of tippers employed for carrying waste to landfill	13
6	Average waste per tipper to landfill(S. No.4/S. No.5)	2.6 tons
7	Meter Reading as on 15/11/18	2472
8	Meter Reading as on 12/12/18	4285
9	Power consumption(S. No.8- S. No.7)	1813 units
10	Power consumed per ton of waste processed	14.79 units/Ton
11	Cost of power consumed per ton of processing (@ Rs.9/unit)	Rs.133/- per ton
12	Estimated Cost of transportation of 70 tippers to landfill	(5720×70) = Rs.4,00,400/-
13	Cost of actual transportation of 13 Tippers to Landfill	(5720×13) = Rs.74,360/-
14	Saving in Transportation on cost	(Rs.4,00,400- Rs. 74,360/-) = Rs.3,26,040/-
15	Saving on every ton of waste processed (S.No.14/S.No.2)	Rs.2660/-per ton

Note: In the cost analysis data provided by the company had calculated their data of the transportation cost assuming that the cost per trip by a tipper was Rs. 4000. As per the details available with DCB the same is Rs. 5720 for hired tippers. Therefore, the expected saving on every ton of waste processed should be revised from Rs. 1860 per ton to Rs.2660 per ton.

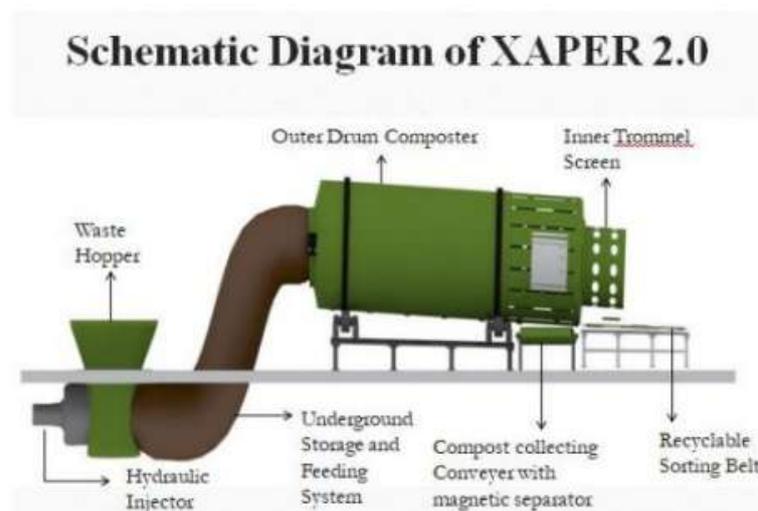
Incase, the DCB tippers were to be considered for transportation of both input and outgoing waste, the net saving per ton of processing would be even higher due to higher manpower cost.

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DESCRIPTION OF XAPER MARK 2.0 : THE PRODUCTION VERSION OF XAPER PROTOTYPE

General

12. XAPER prototype has been proposed to be further improved upon by providing certain additional features, which would refine the operation of the machine and as well as add to the operational and environmental benefits. The modified/improved version of XAPER has been christened as XAPER Mark 2.0.



13. The following advantages/benefits provided by XAPER Mark 2.0 over XAPER Basic model are overwhelming :-

(a) Containerized version of machine which is more compact and easily operable.

(b) Underground storage cum feeding system: In the system, the collected waste shall be directly dropped into underground receptacle and a hydraulic arm will push up the waste to feeding end of XAPER. Underground storage cum feeding system will have following advantages:

(i) No visible waste on ground, with added advantages of no foul smell in the immediate environment.

(ii) No requirement of additional equipment like auto-loader and skilled labour to operate the same thereby saving the associated capital and operational cost.

(iii) Protection from rodents (cows, pigs, dogs etc).

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(iv) Reduced land required for open waste storage.

(v) Saving of manpower cost due to automation of storage and feeding system.

(vi) Consistent and clean feeding in the XAPER.

(c) Volume of XAPER Mark 2.0 has been increased by 40% to have escalated processing capacity and higher aeration to wet waste.

(d) XAPER Mark 1.0 is fitted with transmission wheels of 5 inch width whereas transmission wheels in XAPER Mark 2.0 will have width of 16 inch giving more stability and trouble free operation.

(e) A door of 1 sq.ft. area is provided in Mark 1.0 towards the output end to retrieve out the intermediate rejects whereas in MARK II two doors of 3 SQ.Ft opening are provided which will accelerate the priming process and the output from priming doors falls on sorting belt so will minimise chances of rejects mixing with compostable.

(f) Closed receptacles for combustible rejects.

(g) Collecting mini transportable trolley for compostable.

(h) Provision of magnetic separator from compost conveyer.

(i) Provision of automatic 4 mm sieving facility for extraction of fine compost from compostable material after 21 days of curing.

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TECHNOLOGY COMPARISON: XAPER V/S OTHER TECHNOLOGIES

Parameter	Windrow Composting	Vermiculture Composting	Biomethanation	RDF	Incineration	Landfill	XAPER composting cum Sorting
Technical Parameters							
Location	Centralized	Centralized	Centralized	Centralized	Centralized	Centralized	Decentralized
Waste treatment capacity/Day	1-500 tonnes	1-20 TPD	1-500 TPD	100 TPD	1000 TPD	100 TPD	0.1 ton to 30 tonnes
Segregation requirement	High	High	High	High	High	High	Moderate
Recyclables recovery	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	High
Rejects	60%	60%	60%	30%	15%	NA	30%
Potential of energy recovery	No	No	Yes	No	Yes	No	Yes (waste to fuel facility)
Pre processing Composting time	5 weeks(35 days) (3-5 weekly turnings)	8 weeks	6 weeks	NA	NA	NA	1 -3 Days More than 10000 turnings a day
Maturation period	3 weeks	NA	NA	NA	NA	NA	3 weeks
Commercial parameters							
Land requirement	50000Sq.Mt r.) for 500 TPD (100 Sq.mtr./per ton)	12500 Sq.Mtr for 20 TPD (625 Sq.Mtr / ton)	50000 sq.Mtr for 500 TPD (100 Sq.Mtr/ ton)	20000 sq.mtr for 100 TPD (200 Sq.Mtr per ton)	50000 Sq.mtr for 1000TPD (50 Sq.Mtr.per ton)	30000 sq.Mtr.for 100 TPD (300 sq.mtr per ton)	10x 20.=200 Sq. Mtr for 20 TPD (10 sq.mtr/per ton)

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CAPEX	30-40 Cr. for 500 TPD plant (8 lacs/ton)	1 cr per 10 TPD(10 lac ton)	75-80 Cr. for 500 TPD plant(16 lacs/ton)	17-20 Cr. for 200 TPD plant (10 lacs/ton)	Very High: 15 Cr. per MW power production	High and not recommended by govt.	1.3 Cr for 20 TPD (6.5 lacs/ton)
Energy Input	High (High fuel consumption by Earth movers required for turning)	High	NA	Moderate	NA	Na	Low (200 units of power required for processing of 20 tonnes of waste)10 units per ton
Impact on Transportation cost	None	none	None	None	none	none	Substantial saving in transportation and labour cost.
Possibility for elimination of waste transfer centres	None	None	None	None	None	None	Elimination of waste transfer centers possible.
Labour intensivity and skill requirement	High	High	Moderate	High	moderate	high	LowRequires only one skilled and two unskilled persons for operation
ENVIRONMENTAL PARAMETERS							
Lechate Generation	Potential exists	Insignificant Quantity	Potentially high if not treated properly	High Potential	Potential exists	High potential	Negligible
Air Pollution	Aerosol; Odor issues	Low aerosol; Odor issues	Low aerosol; Odor issues; Biogas leakage	Low aerosol High emission/ Odor issues	Very high emissions	Odor and GHGs emissions	No emission; No Odor; No aerosol

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COST AND SAVING ANALYSIS AFTER DEPLOYMENT OF XAPER MARK 2.0 BY DCB

Present Scenario

14. Huge capital investment made by DCB for procurement and maintenance of the existing large fleet of garbage carrying vehicles. The expenditure annually incurred by DCB in terms of labour and transportation cost for the transshipment of 62 MT of solid waste from the source of generation to the Okhla (waste to energy/composting plants/landfill) is approximately Rs. **Rs.8,50,69,200/-** Out of this expenditure **Rs. 7,49,32,832/-** is for the area under the control of Army and rest is for the civil area.

15. Vehicles being used for transporting Solid municipal waste

Tippers

Hired Tippers = 10

DCB tippers = 13

Total Number of Tippers = 23

Compactors:

Army Compactors = 4

Civil Compactors = 4

Total number of compactors = 8

16. Operational Expenses(OPEX) of tippers

For Hired Tippers = Rs.1,78,46,400/-

No. of Tippers = 10

OPEX tipper day = Rs. 5720/-

OPEX 10 Tippers Year = $5720 \times 10 \times 300 = \text{Rs. } 1,71,60,000/-$

For DCB Tippers =

Tippers = 13

Persons employed per tipper

Driver = $1 \times 13 = 13$ Drivers

Loaders = $4 \times 13 = 52$ Loaders

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Man Power cost year

Driver – 13 at the rate of Rs.56000/- month= $13 \times 56000 \times 12 = \text{Rs.87,36,000/-}$

Loders-52 at the rate of Rs.50000/-month = $52 \times 50000 \times 12 = \text{Rs. 3,12,00,000/-}$

Fuel cost year

Average running of tipper day -77 km

Diesel consumption Day- $77/3.5 = 22$ lit. per tipper

Total fuel consumption year = $13 \times 300 \text{ days} \times 22 = 85800$ lit.

Cost of diesel = $85800 \times \text{Rs.64/-lit} = \text{Rs.54,91,200/-}$

Total OPEX Year = $\text{Rs.87,36,000/-} + \text{Rs. 3,12,00,000/-} + \text{Rs.54,91,200/-} = \text{Rs.4,54,27,200/-}$

The cost does not includes depreciation and Maintenance cost of vehicles

17. Operational Expenses(OPEX) for Compactors

Number of compactors = 8

OPEX compactor Day = Rs. 5880/-

OPEX compactor Year = $8 \times \text{Rs. 5880/-} \times 300 = \text{Rs.1,41,12,000/-}$

18. **Total yearly cost of vehicles (13 DCB tippers + 10 hired tippers + 8 Compactors)**

= $\text{Rs. 1,71,60,000/-} + \text{Rs.4,54,27,200/-} + \text{Rs.1,41,12,000/-} = \text{Rs. 7,66,99,200/-}$

Dumping Charges = $\text{Rs. } 450 \times 62 \times 300 = \text{Rs. 83,70,000/-}$

19. **Grand Total Cost** = $\text{Rs. 83,70,000/-} + \text{Rs. 7,66,99,200} = \text{Rs.8,50,69,200/-}$

That DCB is spending about Rs.4500/- per ton on transportation and dumping of un processed waste.

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20. Suggested Procurement-cum-operational Models for DCB

Three number of XAPER Mark 2.0 of 20 TPD capacity would be adequate to meet the requirement of processing of the entire MSW generated on daily basis in Delhi Cantonment. These could be procured and operated using any of the following models:

- A) DODO (DCB owned and DCB operated)
- B) DOCO (DCB owned and Company operated)
- C) COCO (Company owned and Company operated)

21. Savings after installation of XAPERs DODO

DCB owned DCB operated: In DODO model DCB will invest **Rs.3,90,00,000/-** on acquisition of Machines and will save Rs. **Rs.2,61,70,800/-** every year.

Number of compactors = 4

OPEX compactor Day = Rs. 5880/-

OPEX compactor Year = 4 x Rs. 5880/- x 300= **Rs. 70, 56,000/-**

Total OPEX of 13 tippers of DCB = **Rs.4, 54, 27,200/-**

Expenses on operation of XAPERs =Rs. 64, 15,200/-

Total Expenses after installation of XAPERs =Rs. 5, 88, 98,400/-

Projected savings Rs.8, 50, 69,200 – 5, 88, 98,400=Rs.2, 61, 70,800/-

22. Savings after installation of XAPERs (DOCO)

In DOCO(DCB owned Company operated) model DCB will invest **Rs.3,90,00,000/-** on acquisition of Machines and will save Rs. **Rs.2,58,10,800/-** every year.

Number of compactors = 4

OPEX compactor Day = Rs. 5880/-

OPEX compactor Year = 4 x Rs. 5880/- x 300= **Rs. 70, 56,000/-**

Total OPEX of 13 tippers of DCB = **Rs.4, 54, 27,200/-**

Expenses on operation of XAPERs =Rs. 67, 75,200/-

Total Expenses after installation of XAPERs =Rs.5, 92, 58,400 /-

Projected savings Rs.8, 50, 69,200 – 5, 92, 58,400 =Rs.2, 58, 10,800/-

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23. Savings after installation of XAPERs (COCO)

In COCO model DCB don't have to invest anything on acquisition but will save **Rs.88,00,000/-** every year

Number of compactors = 4

OPEX compactor Day = Rs. 5880/-

OPEX compactor Year = 4 x Rs. 5880/- x 300 = **Rs. 70, 56,000/-**

Total OPEX of 13 tippers of DCB = **Rs.4, 54, 27,200/-**

Expenses on operation of XAPERs =Rs. 2, 37, 96,000/-

Total Expenses after installation of XAPERs =Rs.7, 62, 69,200 /-

Projected savings Rs.8, 50, 69,200 – 7, 62, 69,200 =Rs.88, 00,000/-

24. Additional savings/earning after zero waste model

After superimposing the ZERO WASTE model additional savings in all the models would be **Rs.85, 56,000/-** per year as calculated below:

Savings: OPEX for hiring of four compactors per year = 4 x Rs. 5880/- per day x 300 days = **Rs. 70, 56,000/-**

Earning: Revenue from sale of compostable material and Combustible material i.e. 25 tons per day after the processing by three XAPER Mark 2.0 machines to company = 25 (tons) x 300 (days) x Rs. 200 = **Rs.15, 00,000/-**

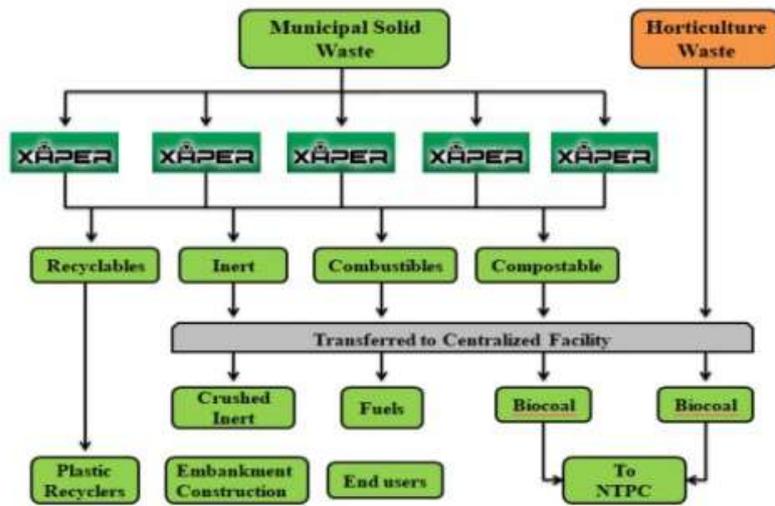
Total Savings/Earnings: Rs. 70, 56,000/- + Rs.15, 00,000/- = Rs.85, 56,000/-

Assumption:

- Operational cost of vehicles use in the civil area for door-to-door collection have not been taken into consideration as these vehicles will continue to operate as hitherto fore, that of instead of carrying the solid waste to the 11 waste transfer centers, these will directly unload the solid waste at the XAPER sites within the cantonment. In effect, this arrangement will eliminate the requirement of continuing with the 11 existing waste transfer centers/dhallaos thereby, removing a number of eyesores in Delhi Cantonment and moving in the direction of attaining the overall aim of SBM.

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ZERO-WASTE MODEL FOR DELHI CANTONMENT BOARD



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OVERALL ANALYSIS OF SORTING-CUM-COMPOSTING TECHNOLOGY INCORPORATED IN XAPER BASED ON THE TERMS OF REFERENCE

Aspects for evaluation by the Validation Committee

The validation committee has evaluated the technology covering the following aspects as mentioned in the terms of reference:-

- 1. Appropriateness of the technology and confirmation of the segregation of waste into various fractions. The committee will also identify the components getting segregated.**
 - It is seen that the production version i.e. XAPER Mark 2.0 with underground storage system is a three-in-one concept of SWM, since it provides distinct advantage for handling mixed waste as well as segregated dry/wet waste.
 - It has been established that the volume and mass reduction would be of the order of 70-75% in the case of mixed solid waste and to the tune of more than 85% in respect of wet waste. In either case there would be substantial saving on account of transportation and labour cost which are presently being incurred by DCB.
 - Although segregation of waste by households is a highly desirable feature of SWM, in practice despite best efforts the degree of is far below the expected level further technology to process bio degradable waste requires all the way. Therefore, XAPER provides the inherent advantage by virtue of the technology involved
 - If there is any fraction of one kind of waste in the segregated waste of the other category the machine has the ability to rectify the human negligence at the household level. Hence, the machine while processing the input waste of one category is also able to address the undesirable presence of the other category of waste which is also getting simultaneously segregated/ processed. Thereby, the unique features and versatility of XAPER Mark 2.0 has been clearly established.
 - It is pertinent to bring out that no available or known technology other than used by XAPER accepts any kind of waste for processing/refinement. XAPER Mark 2.0 is truly a three-in –one technology as far as handling of mixed waste or segregated wet/dry waste is concerned. The machine efficiently segregates the mixed waste into various fractions, converts the wet/food waste into compostable material for subsequent production of high quality compost, separates the recyclables in a way which allows for 100% retrieval of these and qualitatively improve the combustibles such that these can be used as excellent raw material for waste to energy plants or for conversion into fuel of various kinds.
 - It leads to no formation of lechate and release of any harmful gases such as methane and Hydrogen Sulphide, that is the reason for the pungent smell of waste. .

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- The quality of compost produced through XAPER is of FCO standards. The company has provided the compost testing report of finished compost processed through XAPER, tested from PBTI Chandigarh and it has found to be conforming to FCO standards. The company has also submitted a sample of compost for testing at IARI Pusa. DCB may also get a sample of the compost tested at their level.
 - Instant composters or bio-methnation fails in other cities it does not make any sence to replicate failures.
 - While comparison with other technologies it has been found that XAPER has distant advantages over other technologies and advantages provided by XAPER Mark 2.0 over XAPER Basic model are overwhelming.
2. **Analytical comments on the suitability of the technology for garbage handled by Cantonment Board.**

- Ideally suited for DCB where the overall Army and Civil pockets spread over a large area,
- DCB has larger area to cover but the overall quantum of waste is proportionately lower than the other municipalities in Delhi.
- On an average large fleet of 31 vehicles (23 tippers + 8 Compactors) travels 77 km/day to dump 62 tons of waste at Okhla dumpsite. On an average tippers carry 1.3 tons waste much lower than its optimum capacity.
- As per estimates DCB is spending Rs.8, 50, 69,200/- every year to dump 18600 tons of waste produced. That DCB is spending about Rs.4500/- per ton on transportation and dumping of un-processed waste.
- The XAPER Mark 2.0 technology XAPER can be ideally exploited for processing of all the 62 tons solid waste generated in Delhi cantonment area.
- By installation of three Sorting cum Composting machines of 20 TPD capacity to handle the entire solid waste within the geographical limits of Delhi Cantonment.
- The technology lends itself to be adopted for DCB as the waste from various locations can be brought to 3 decentralized locations preferably Kirby place, Shankar Garden and Arjun Vihar
- It is expected that the compost produced by processing biodegradable waste can be utilized within the cantonment as large green belts in the area.
- It will also enable DCB to reduce the overall carbon footprints as there is no methane/hydrogen sulphide/any harmful gas emission and no lechate formation which can pollute the ground water and surface water bodies. As well as it will

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take away 15 big vehicles from the roads reducing traffic congestion and pollution from Delhi.

3. **Validation of the performance data presented by the company in consultation with sanitation and MT section of DCB.**
 - 70 vehicles trips were used to deliver 122.55 MT of waste at XAPER site, Kirby place Delhi Cantonment. Only 13 vehicles were used to carry away 34.14 MT to Okhla land fill. About 75% reduction in waste appreciable and is significant for DCB as it will save the transportation cost for 75% of waste generated by Delhi Cantonment on daily basis. Data submitted by company in its performance report is confirmed by DCB official's member of validation committee.
4. **Carry out the cost analysis of the machine XAPER operation, including the likely saving in terms of labour and transportation cost for DCB.**

Estimated savings in different procurement-cum-operational models are as under:-

- In DOCO (DCB owned Company operated) model DCB would be required to invest **Rs.3, 90, 00,000/-** on acquisition of Machines and will save **Rs. 2, 58, 10,800/-** every year after the break even period of 15 months.
- In DODO (DCB owned DCB operated) model DCB would be required to invest **Rs.3, 90, 00,000/-** on acquisition of Machines and will save **Rs. 2, 61, 70,800/-** every year after the break even period of 15 months.
- In COCO (company owned company operated) model DCB would not have to invest anything on acquisition but will save **Rs.88, 00,000/-** every year, even after paying the operational expenses to the company for the machines.
- After superimposing the ZERO WASTE model, additional savings/earnings in all the above mentioned models would be **Rs.85,56,000/-** per year on account of non-payment of dumping charges
- In case of any of the DODO and DOCO Model, DCB will break-even the investment within 18 months.

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5. **Suggest further modifications, if any, in the prototype of the machine which may be adopted in the production version.**

The committee suggested modifications like magnetic separator, automatic sieving machine etc. for streamlining the overall operation, which has already been adopted for the commercial version of XAPER prototype named XAPER Mark 2.0 which includes the modifications already listed in the document above.

6. **Give recommendations for the adoption of XAPER technology by DCB for processing of the complete quantity of approximately 62 MT solid waste, generated on daily basis in Delhi Cantonment Area.**

The committee recommends:-

- That three sorting cum composting machines XAPERs of 20 TPD capacity must be installed at Kirby place, Shanker Garden & Arjun Vihar.
 - That vehicles used in the civil area for door-to-door collection carrying the solid waste to the 11 waste transfer centers, should directly unload the solid waste at the Kirby place XAPER site. In effect, this arrangement will eliminate the requirement of continuing with the 11 existing waste transfer centers/dhallaos thereby, removing a number of eyesores in Delhi Cantonment and moving in the direction of attaining the overall aim of SBM.
 - That after installation of 3 XAPERs it is expected that waste shall be reduced to 20 tons from 62 tons so only 4 compactors can serve the purpose of transporting waste to waste to energy site thus 14 vehicles from private sector (10 tippers+4compactors) shall retire and 13 tippers of board shall be used to carry waste to XAPER sites at Shankar Vihar and Arjun Vihar.
7. **Critically analyze the 'Zero Waste Model' proposed for Delhi Cantonment, by the company, based on deployment of XAPER machines, duly supplemented by centralized waste to fuel (WtF) facility proposed to be set up 'free of cost' by the company.**

In the zero waste model, the company has agreed to invest three times the cost of XAPER expected to be installed in DCB so that the fraction coming out of the XAPER can be taken to the centralized facility to be set up by the company where it will be converted to fuel and no waste will be sent to landfill. The facility will also accept the horticulture/green waste generated in Delhi Cantonment on daily basis to produce bio-coal from it. This facility has been promised to be set up free of cost as a gesture of

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gratitude towards DCB for providing the opportunity to the company for XAPER prototype installation and validation of the same.

The fraction generated from the XAPER will be bought by the company at Rs. 200 per ton of waste which will generate daily revenue of Rs. 5000-6000 for DCB.

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FINAL RECOMMENDATIONS BY THE VALIDATION COMMITTEE

1. The overall savings in transportation and labour costs, after the deployment of XAPER Mark 2.0 for processing of MSW (Municipal Solid Waste), would be significant using any of the suggested procurement-cum-operational model.
2. It is recommended that sorting-cum-composting technology should be employed for the processing of entire MSW of approximately 62 MT per day, generated collectively in the Army and Civil Area of Delhi Cantonment. The company has proposed to provide extended warranty of upto 4 years. At the prevailing cost of labour and transportation, there would be a saving of approximately Rs. 2.5 crore per annum by adopting the DODO/DOCO model of acquisition and operation. This would translate into long-term financial benefit of in excess of Rs. 20 crores, including AMC and operational cost escalations over a period of 10 years, after the break-even period of only 15 months.
3. The zero waste model, through the employment of XAPER, together with Centralized Waste to Fuel (WtF) facility, as proposed by the M/s Palta Engineering Works Pvt. Ltd would further result in an additional revenue of Rs. 4000/- to - 5000/- per day i.e approximately Rs. 12 to 15 lacs per annum to DCB. However, DCB would be required to provide land measuring (100 m × 30 m) and the power required to run the WtF facility. If approved, the company may be asked to forward their formal proposal for the same.

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Schedule of Meetings

- (a) First meeting on 05-01-2019 at Conference hall, DCB.
- (b) Second meeting on 08-01-2019 at Conference hall, DCB.
- (c) Third meeting on 10-01-2019 at Conference hall, DCB.
- (d) Fourth meeting on 01-02-2019 at Conference hall, DCB.
- (e) Fifth meeting on 07-02-2019 at Kirby Place, DCB.

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MINUTES OF MEETING (1st Meeting)

Meeting: Validation of 'Sorting-cum-composting' technology incorporated in XAPER prototype machine, installed by M/s Palta Engineering Works Pvt. Ltd at Kirby Place.

Time, Day and Date: 11:30 AM to 1:00 PM, Saturday, 05-01-2019

Venue: Conference hall, Delhi Cantonment Board Office.

ITEM 1.0 OPENING OF THE MEETING

On behalf of M/s Palta Engineering Works Pvt. Ltd, Mr. Ajay Palta and Ms. Jasmeet Kaur welcomed the members to the meeting. Ms. Jasmeet Kaur gave a brief about the company and its work in the field of Solid Waste Management. All the members were provided with a folder each containing the following documents:

- XAPER Prototype Performance Report
- Calibrated data generated during the operation of XAPER prototype from 16/11/2018 to 15/12/2018.
- Schematic Diagram of XAPER 2.0
- Process Flowchart

ITEM 2.0 PRESENTATION OF XAPER PROTOTYPE DEMONSTRATION

Ms. Jasmeet Kaur delivered a presentation followed by a video of the XAPER prototype working at Kirby Place. The presentation showcased the concept/principle and working of the XAPER prototype. The calibrated data generated from 16/11/2018 to 15/12/2018 was also presented. However, the chairman mentioned that the deliberation on the same would be carried out during the next meeting.

ITEM 3.0 QUERIES AND DISCUSSION

A few queries which were raised during the meeting and the company's response for the same is as given below:

- Q. 1. How the plastic or glass fraction below 12 mm will be separated from compostable material and what is its affect on the quality of compost?

Ans: The compostable material will be subjected to a curing period of 3-4 weeks after which it will be sieved through 4mm sieve which will remove all the plastic or glass fraction. In any case, plastic is non-reactive in nature so it does not hamper the quality of compost in any way. However, people should be made aware about segregation of hazardous waste at source from municipal solid waste.

- Q.2 What is appropriate location for XAPER installation?

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Ans. Waste should be processed at decentralized locations nearer the point of waste generation.

Q. 3 What is the cost of machine & land requirement, for installation of XAPER?

Different models of XAPER mark.2.0 are available on GEM. Preview of different models is as under

MODEL	COST MACHINE	CAPACITY DAY Mixed waste*	Power required	Land required
XAPER-5	Rs.60,20,000/-	5000 kg(5ton)	6 KW	12mx10m=120sq.mtr
XAPER -10	Rs.95,68,000/-	10000kg(10 ton)	12 KW	15mx10m=150sq.mtr
XAPER-20	Rs.1,29,37,000/-	20000kg(20 ton)	22 KW	20mx10m=200sq.mtr

*mentioned capacity is for Mixed MSW with 50% bio degradable fractions, that system can process upto 50% of its capacity.

Q.4 What is operation cost of three 20 TPD XAPERs?

XAPER Operational Expenses

Daily Labour Cost = [(2×700) + (4×550)] = Rs. (1400+ 2200) = Rs.3600/-

Daily Power Consumption = Rs. 1800/-

Daily total expenses= Rs. 3600 + 1800 = Rs. 5400/-

Monthly operational expenses = Rs. 5400 × 30 = Rs. 1, 62,000/-

Yearly operational expense = Rs. 1, 62,000 ×12 = Rs. 19,44,000/-

+ 10% contingencies = Rs. 1,94,400/-

Total Rs.21,38,400/-

Operation expenses for three machines Rs.21,38,400/- x 3= Rs.64,15.200/-

Q.6. Is XAPER also capable of handling hazardous waste or hospital waste?

Ans. No, XAPER is not designed for handling hazardous or hospital waste. The same is to be handled as per government policies, at appropriate specialize plants.

Q. 7. How XAPER is better than other existing technologies?

Ans. It was intimated to the committee that comparison with other technologies will be drawn out in the next meeting.

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Q. 8. How much warranty comes with XAPER?

Ans. As per the norms led by government E-marketplace, all the composting machine generally provide a warranty period of 5 years, however our company will be providing an additional year of warranty i.e 6 years. XAPER will be given on Turnkey basis to DCB

Q.9. What type of working business-models company proposes to operate three 20 TPD machines?

Proposals from company

Company proposes following three models:-

1. DCB owned DCB operated(DODO): That DCB will purchase three 20 TPD machines by investing Rs.3.90 Cr. and operate them itself by spending Rs. 64,15,200/-
2. DCB owned Company operated(DOCO):- That DCB will purchase three 20 TPD machines by investing Rs.3.90 Cr. and company will operate machines while charging Rs.67,75,200/- per annum form DCB for the services.
3. Company owned company operated(COCO):- That company will make all the capital investments and will takeup operations of machines. In lieu of services will charge Rs. 2,37,96,000/- per annum form DCB.

ITEM 4.0 NEXT MEETING

The committee decided to have another round of meeting to be held on 08-01-2019, Tuesday at 11:30 AM in the conference hall after analyzing the data and handouts provided to the committee, followed by a visit to the site of demonstration.

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MINUTES OF MEETING (2nd Meeting)

Second Meeting: Validation of 'Sorting-cum-composting' technology incorporated in XAPER prototype machine, installed by M/s Palta Engineering Works Pvt. Ltd at Kirby Place.

Time, Day and Date: 11:30 AM to 1:00 PM, Tuesday, 08-01-2019

Venue: Conference hall, Delhi Cantonment Board Office.

ITEM 1.0 OPENING OF THE MEETING

On behalf of M/s Palta Engineering Works Pvt. Ltd, Mr. Ajay Palta and Ms. Jasmeet Kaur welcomed the members to the meeting and briefed about the previous meeting and gave a brief about the company and its work in the field of Solid Waste Management. All the members were provided with a folder each containing the following documents:

- XAPER Performance Report
- Data generated from 16/11/2018 to 15/12/2018.
- Schematic Diagram of XAPER 2.0
- Process Flowchart
- Technology Comparison
- Compost Test Report
- Zero Waste Proposal
- Article: Failure of Composting Machines in Bangalore
- Research Article: Comparison of Waste Compactors
- A few appreciation letters

ITEM 2.0 BRIEFING OF XAPER PROTOTYPE DEMONSTRATION

Ms. Jasmeet Kaur delivered a presentation followed by a video of the XAPER prototype working at Kirby Place. The presentation showcased the concept/principle and working of the XAPER prototype. The calibrated data generated from 16/11/2018 to 15/12/2018 was also presented. She also delivered a presentation on Zero Waste Model for DCB followed by a animation video of the XAPER Mark 2.0 which is the production model of XAPER. The presentation also showcased the concept and working of biomass to fuel conversion and plastic to fuel generation.

ITEM 3.0 QUERIES AND DISCUSSION

All the queries of the evaluation committee members were answered satisfactorily.

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The queries are as follows:

1. How XAPER is better than the existing technologies?

Ans: The processing that occurs in XAPER is referred as bio-drying which utilizes the natural aeration for removing the moisture present in the wet/food waste and also accelerates the decomposition rate by increasing the microbial activity of bacterial present in the food waste, so we also refer XAPER as a Green Technology as it does not use any external heating system or energy consumption for drying the material. A detailed tabulated technology comparison was provided to the committee members for studying in detail. There is no technology around the world which can make compost in 1 day. It is a natural process which takes 3-5 weeks to form quality usable compost.

2. How XAPER handles/process the MSW?

Ans. It is based on time-tested mechanical biological treatment (MBT) technology of size separation and in-vessel(Drum) Composting. The system is an incorporation two different technologies namely trommel screening and in-vessel composting in one single system in the form of concentric drums which is compact enough to be installed at decentralized secondary transfer points where the waste can be stored and processed simultaneously. Both the technologies are recommended by the MSWM manual 2014 for processing the waste. Trommel screen i.e. inner drum segregates the waste fraction into non-biodegradable (>100mm size) and biodegradable (<100 mm size). The mechanically tumbling of in-vessel composter i.e. outer drum facilitates aerobic decomposition of organic fraction to compost. The processing was also shown through video and animation to the committee.

3. How XAPER improves the recovery of recyclables?

Ans. Traditionally, the rag-pickers are able to recover only 25-30% of the recyclable present in the mixed solid waste through manual sorting in contrast XAPER enables them to recover 95% of recyclables from the mixed solid waste by removing the moisture from the mixed waste and also increases their earning by making their working conditions hygienic.

4. Why are there cleanliness issues at the XAPER prototype demonstration site, Kirby Place?

Ans. We are constantly trying to maintain the cleanliness of the site though there was no provision of concrete boundary all around. Fresh waste always attracts animals like cow and pigs which had destroyed the boundaries that were made by us. There also has been some thefts from the site and we are constantly making effort to make the site clean. It is also clarified to the members that in the commercial model XAPER mark 2.0 underground feeding system there will not be any visible waste over the ground.

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After a lot of discussions and clarifications, the members of the committee specially Smt. Priyanka Chaudhary have strongly recommended the procurement of XAPER for DCB so that the waste can be reduced at decentralized locations which will save 70% of the transportation cost and the rest of the 30% should go to some waste to energy/fuel plant by which a zero waste model can be implemented for Delhi Cantonment.

ITEM 4.0 NEXT MEETING

The committee decided to have another round of meeting to be held on 10 -01-2019, after analyzing the data and handouts provided to the committee, followed by a visit to the site of demonstration.

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MINUTES OF MEETING (3rd Meeting)

Third Meeting: Validation of 'Sorting-cum-composting' technology incorporated in XAPER prototype machine, installed by M/s Palta Engineering Works Pvt. Ltd at Kirby Place.

Time, Day and Date: 11:30 AM to 1:00 PM, Thursday, 10-01-2019

Venue: Conference hall, Delhi Cantonment Board Office.

ITEM 1.0 OPENING OF THE MEETING

On behalf of M/s Palta Engineering Works Pvt. Ltd, Ms.Jasmeet Kaur welcomed the members to the meeting and briefed about the previous meeting and the queries addressed during the same. The meeting was taken forward from the point where it ended in the first meeting. All the members were provided with handouts of:

- XAPER Performance Report
- Data generated from 16/11/2018 to 15/12/2018.
- Schematic Diagram of XAPER 2.0
- Process Flowchart
- Technology Comparison
- Compost Test Report
- Zero Waste Proposal
- Article: Failure of Composting Machines in Bangalore
- Research Article: Comparison of Waste Compactors
- A few appreciation letters

ITEM 2.0 BRIEFING OF XAPER PROTOTYPE DEMONSTRATION

Ms. Jasmeet Kaur briefed the committee with the overall prospective of Solid Waste Management across the municipalities in the country. He emphasized on decentralized processing technology which would not only reduce the waste mass and volume but also saves the transportation cost for the local authorities. Being involved in the pilot since its installation, he also gave an overview on XAPER prototype and its working and the observation from the data obtained and referred XAPER as a Green Technology. Ms. Jasmeet Kaur delivered a presentation on Zero Waste Model for DCB followed by a animation video of the XAPER Mark 2.0 which is the production model of XAPER. The presentation also showcased the concept and working of biomass to fuel conversion and plastic to fuel generation.

ITEM 3.0 QUERIES AND DISCUSSION

All the queries of the evaluation committee members were answered satisfactorily.

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MINUTES OF MEETING (4th Meeting)

Fourth Meeting: Validation of 'Sorting-cum-composting' technology incorporated in XAPER prototype machine, installed by M/s Palta Engineering Works Pvt. Ltd at Kirby Place.

Time, Day and Date: 4:00 PM to 6:00 PM, Thursday, 01-02-2019

Venue: GE Project (East) Office.

ITEM 1.0 OPENING OF THE MEETING

On behalf of M/s Palta Engineering Works Pvt. Ltd, Ms.Jasmeet Kaur welcomed the members to the meeting and briefed about the previous meeting and the queries addressed during the same. The meeting was taken forward from the point where it ended in the first meeting. All the members were provided with handouts of:

- XAPER Performance Report
- Data generated from 16/11/2018 to 15/12/2018.
- Schematic Diagram of XAPER 2.0
- Process Flowchart
- Technology Comparison
- Compost Test Report
- Zero Waste Proposal
- Article: Failure of Composting Machines in Bangalore
- Research Article: Comparison of Waste Compactors
- A few appreciation letters

ITEM 2.0 BRIEFING OF XAPER PROTOTYPE DEMONSTRATION

Mr. Ajay Palta briefed the committee with the overall prospective of Solid Waste Management across the municipalities in the country. He emphasized on decentralized processing technology which would not only reduce the waste mass and volume but also saves the transportation cost for the local authorities. Being involved in the pilot since its installation, he also gave an overview on XAPER prototype and its working and the observation from the data obtained and referred XAPER as a Green Technology. Mr. Ajay Palta delivered a presentation on Zero Waste Model for DCB followed by a animation video of the XAPER Mark 2.0 which is the production model of XAPER. The presentation also showcased the concept and working of biomass to fuel conversion and plastic to fuel generation.

ITEM 3.0 QUERIES AND DISCUSSION

All the queries of the evaluation committee members were answered satisfactorily.

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MINUTES OF MEETING (5th Meeting)

Fifth Meeting: Validation of 'Sorting-cum-composting' technology incorporated in XAPER prototype machine, installed by M/s Palta Engineering Works Pvt. Ltd at Kirby Place.

Time, Day and Date: 11:00 AM to 12:00 PM, Thursday, 07-02-2019

Venue: Kirby Place, Delhi Cantonment.

ITEM 1.0 OPENING OF THE MEETING

On behalf of M/s Palta Engineering Works Pvt. Ltd, Ms. Jasmeet Kaur welcomed the members to the meeting and briefed about the previous meeting and the queries addressed during the same. The meeting was taken forward from the point where it ended in the first meeting. All the members were provided with handouts of:

- XAPER Performance Report
- Data generated from 16/11/2018 to 15/12/2018.
- Schematic Diagram of XAPER 2.0
- Process Flowchart
- Technology Comparison
- Compost Test Report
- Zero Waste Proposal
- Article: Failure of Composting Machines in Bangalore
- Research Article: Comparison of Waste Compactors
- A few appreciation letters

ITEM 2.0 BRIEFING OF XAPER PROTOTYPE DEMONSTRATION

Mr. Ajay Palta briefed the committee with the overall prospective of Solid Waste Management across the municipalities in the country. He emphasized on decentralized processing technology which would not only reduce the waste mass and volume but also saves the transportation cost for the local authorities. Being involved in the pilot since its installation, he also gave an overview on XAPER prototype and its working and the observation from the data obtained and referred XAPER as a Green Technology. Mr. Ajay Palta delivered a presentation on Zero Waste Model for DCB followed by a animation video of the XAPER Mark 2.0 which is the production model of XAPER. The presentation also showcased the concept and working of biomass to fuel conversion and plastic to fuel generation.

ITEM 3.0 QUERIES AND DISCUSSION

All the queries of the evaluation committee members were answered satisfactorily.

9/25/23, 1:03 AM

E3 Waste Solutions Mail - REQUEST FOR SUBMISSION OF PROPOSAL AND MEETING AT DCB

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xaper waste solutions <info@e3wastesolutions.com>

REQUEST FOR SUBMISSION OF PROPOSAL AND MEETING AT DCB

2 messages

pardeep <pkdogra2458@gmail.com>
To: info@e3wastesolutions.com

2 February 2021 at 20:44

Dear Mr Palta,

1. Reference the discussions held with your Company in the office of , CEO Delhi Cantonment Board and my telephonic conversation with you of date.

2. We wish to invite you for further discussions regarding your proposal for the processing of 70 MT of solid waste on a daily basis in Delhi Cantonment, with the aim to achieve a "Zero Waste Solution" for the problem of solid waste management.

3. Please confirm the availability of the CMD and other officials of your company for further discussions in this matter at DCB ,on an early date. Accordingly , a suitable time will be indicated to you.

Please accord priority.

With best wishes!

Col(Retd.) P K Dogra
Consultant
Delhi Cantonment Board

Regards!

Col. P.K Dogra

General Information <info@e3wastesolutions.com>
To: pardeep <pkdogra2458@gmail.com>

4 February 2021 at 14:53

Dear Col. Dogra,

Thank you for your mail.

In reference to our past meetings and conversations regarding processing of 70 MT of solid waste on a daily basis to achieve a Zero Waste disposal to landfill in Delhi Cantonment, I have already given the proposal and am attaching here again for your reference.

Meanwhile another XAPER of 5 TPD mixed waste processing capacity installed at Ambala Cantonment and is formally inaugurated by Karga Corps commander Lt Gen S.S. Mahal on 30/01/2021. <https://timesofindia.indiatimes.com/city/chandigarh/solid-waste-management-plant-worth-rs-70-lakh-inaugurated/articleshow/80616296.cms>

Another installation of 10 TPD XAPER is in progress at Jafrabad in East Delhi under waste to wealth by PSA to Gol, which will be done by 15/02/2021.

In order to close the deal with DCB for the processing of 70 MT of solid waste on a daily basis to achieve a Zero Waste disposal to landfill in Delhi Cantonment, we will be available for discussion/negotiation any day after 11/02/2021. Kindly suggest a suitable date and time for the same accordingly.

Thank you

Regards
Ajay Palta
Founder/CMD
XAPER Waste Solutions Pvt. Ltd
[Quoted text hidden]

9/25/23, 1:03 AM

E3 Waste Solutions Mail - REQUEST FOR SUBMISSION OF PROPOSAL AND MEETING AT DCB

 **DCB_Proposal.pdf**
227K

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9/25/23, 1:04 AM

E3 Waste Solutions Mail - Submission of Proposal and Meeting at DCB

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xaper waste solutions <info@e3wastesolutions.com>

Submission of Proposal and Meeting at DCB

1 message

General Information <info@e3wastesolutions.com>

6 February 2021 at 13:21

To: ceodelhicantt@gmail.com

Cc: pardeep <pkdogra2458@gmail.com>

Dear Sir,

Thank you for your mail.

In reference to the mail from Col. P.K. Dogra, our past meetings and conversations regarding processing of 70 MT of solid waste on a daily basis to achieve a Zero Waste disposal to landfill in Delhi Cantonment, I have already given the proposal and am attaching here again for your reference.

Meanwhile another XAPER of 5 TPD mixed waste processing capacity installed at Ambala Cantonment and is formally inaugurated by Karga Corps commander Lt Gen S.S. Mahal on 30/01/2021. <https://timesofindia.indiatimes.com/city/chandigarh/solid-waste-management-plant-worth-rs-70-lakh-inaugurated/articleshow/80616296.cms>

Another installation of 10 TPD XAPER is in progress at Jafrabad in East Delhi under waste to wealth by PSA to Gol, which will be done by 15/02/2021.

In order to close the deal with DCB for the processing of 70 MT of solid waste on a daily basis to achieve a Zero Waste disposal to landfill in Delhi Cantonment, we will be available for discussion/negotiation any day after 11/02/2021. Kindly suggest a suitable date and time for the same accordingly.

Thank you

Regards
Ajay Palta
Founder/CMD
XAPER Waste Solutions Pvt. Ltd

 **DCB_Proposal.pdf**
227K

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CIRCULAR AGENDA**Procurement of XAPER Machines for decentralized processing of Solid Waste to achieve 'Zero Waste' scenario in Delhi Cantonment**

1. To consider the report of Col (Retd.) PK Dogra, Consultant, DCB with regard to procurement of XAPER machines for decentralized processing of solid waste management to achieve 'Zero Waste' scenario in Delhi Cantonment. As per the report;
 1. *The management of municipal solid waste (MSW) has been a vexing problem, involving huge expenditures in terms of manpower, vehicles and environmental cost. Efforts have been made at various levels throughout the country to arrive at possible solutions for processing of MSW at the most economical cost. The centralized composting as well as waste to energy plants setup in NCR are operating at sub optimal capacity for want of proper segregation of MSW into wet and dry streams. Accordingly, directions have been issued by Hon'ble NGT for strict adherence to Solid Waste Management Rules 2016, which not only insist on 100% segregation at source but also impel the setting up of decentralized facilities for processing of MSW, such that no part of daily waste should have to be transported and dumped at far flung landfills.*
 2. *Extensive efforts have been made by DCB during the last three years to carry out market survey and study the available technologies for decentralized processing of MSW. Segregation of waste at source has been a challenging problem which despite best efforts, particularly in terms of spreading public awareness, still leaves much to be desired. Hence, a technological solution to solve the problem of segregation at source together with suitable machines for decentralized processing of daily waste is being sought to date.*
 3. *In the existing system of management of MSW, the entire waste after door to door collection and removal of the recyclables, is transported to Okhla for processing/dumping at the landfill site on a daily basis. This is being done at a huge cost of approximately 18 Cr per year, involving the employment of large number of vehicles and manpower. The intangible environmental costs in terms of excessive flow of vehicles, the associated air pollution and foul smell caused on account of the same, are over and above.*
 4. *The following technologies for the decentralized processing of MSW have been studied over time and evaluated on relative merit basis, to arrive at the best solution for DCB:-*
 - (a) *Drum Composting after manual segregation The MCDs in Delhi are using drum composting machines of 1 TPD capacity, which take the **input in the form of segregated wet waste only**. These machines have been found to be expensive, the capital cost of one machine being approximately 35 Lacs as quoted in GeM portal. The operating cost per ton of processing per day is approximately Rs. 2800/-, which translates into an annual cost of approximately 10 Lacs for the daily processing of only one ton of segregated waste. Both the capital as well as operating cost are quite high and there is a problem of excessive foul smell due to the leachate generation.*
 - (b) *Biomethanation. A few machines of 5 TPD capacity have been deployed by the MCDs. The capital cost per machine is approximately 3.6 Cr. as quoted in the GeM portal. These machines require 100% segregated wet waste only and there is a drop in performance in case of adulterants in the wet waste. These machines do not provide Any solution for the*

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handling of dry waste. The annual operating cost for 5TPD machine is approximately Rs. 30 Lacs.

(c) *Sorting cum Composting Technology* This is a unique patented technology which permits the processing of **segregated, as well as mixed waste**(with no requirement of segregation at source). The mixed waste is segregated into biodegradable and non-biodegradable fractions automatically by the machine using this technology. The dry component of the waste, after mechanical segregation by the machine, emerges out as RDF (Refuse Derived Fuel), which is suitable for use by cement plants. The wet waste is converted into compostable material on a daily basis which cures naturally into compost in three weeks' time. The entire process is aerobic i.e. in the presence of oxygen and there is no generation of foul smelling leachate. Also there are no harmful emissions during the processing of waste. A prototype of 10 TPD capacity machine using this technology, was trial evaluated by DCB during 2018-19. An average reduction of 75% from input to output stage was achieved during the calibrated trials of the machine. **The capital as well as the operating cost of this technology have been found to be the lowest among various decentralized processing technologies.** However, the decision to pursue this technology could not be taken at that stage since the commercial models of the same were still awaited.

(d) A comparative analysis of the above technologies is given at Appendix 'A'.

5. The office of Principal Scientific Advisor (PSA) to Govt. of India, had carried out extensive research for identifying suitable technology for processing of MSW in their 'Waste to Wealth' mission during the year 2019-20. After comparative evaluation of various technologies, they shortlisted and recommended the use of XAPER machines which employ the 'Sorting cum Composting technology', for the decentralized processing of fresh daily waste. The details of the same were received vide DPCC letter No. DPCC/WMCII/ PSA/SS/2020/3254-3261 dated 09.03.2020. Subsequently, Version1 of XAPER machine was installed by the PSA in EDMC area at Shahdara in January 2020. The machine was operated for few months under the overall directions from PSA office. The Version1 of XAPER had an underground configuration which affected its efficiency adversely due to inadequate aeration.

6. A team of DCB officials headed by Jt. CEO visited the site where Version1 of XAPER machine was deployed at Shahdara, in October 2020. Due to certain infrastructural modifications, which were underway as per the orders of the PSA office, the operation of the machine had been temporarily halted. However, after checking various aspects it was noted by the visiting team that the machine would require certain modifications at the input and output stages to be considered worthy for meeting the requirements of DCB. On interaction with the PSA office, it was learnt that they had already asked the manufacturer to make a few design changes to achieve higher degree of efficiency and automation for user friendly operation.

7. The Version2 of XAPER machine incorporates all necessary improvements and is in an over-ground configuration with higher efficiency. It was installed as per the directions of the PSA in Jafrabad area of EDMC, in April 2021. The PSA office has intimated vide their email dated 29.06.2021 that 'the Version2 of XAPER is functioning satisfactorily and Delhi Cantonment may want to consider installing the Version2 of the XAPER machine to segregate and treat fresh waste'. The salient details of this improved design of the machine,

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are given in the said email placed at Appendix 'B'. It is noteworthy that as per the analysis of this technology by the PSA, the mass reduction achieved from the input to the output stage is of the order of 85% as against 75% recorded during the trial of the prototype of the machine by DCB.

8. The Integrated HQ of MOD (Army)/QMG Branch were also evaluating various options for the processing of MSW by Army units. During July 2020, officers from QMG branch came for an interaction at DCB to discuss the same. The details of the trials of 10 TPD XAPER were shared with them and they were further advised to interact with the PSA office for the analysis of various other available technologies. The Integrated HQ of MOD (Army)/QMG Branch vide their letter No. 00159/Misc/Coord/Adm&Coord dated 01.12.2020 have intimated that the COAS (Chief of Army Staff) has approved the option of utilizing XAPER machine for waste management (Refer Appendix 'C').

9. The average daily waste generated in Delhi Cantonment area, including the area under the management of Army, is approximately 68 MT. It is envisaged that, subject to approval by the Board, as per the recommendation made by the PSA, 3x20 TPD XAPER machines and 1x10 TPD XAPER machine would together provide a processing capacity of 70 MT, which would adequately meet the requirement.

10. The 10 TPD and 20 TPD XAPER machines, which employ the patented sorting cum composting technology, are available for procurement through the GeM portal. The quotations for these machines are given at Appendices 'D' and 'E' respectively. It is recommended to install the XAPER machines in a phased manner, in that, 2 x 20 TPD machines may be installed in Phase 1, and after successful operation of the same the remaining 1 x 20 TPD and 1 x 10 TPD machine may be installed.

11. It is pertinent to mention that the operating cost for the machines and the AMC have not been indicated in the quotes available in the GeM portal. It is therefore recommended that these should be finalized through a meeting with the manufacturer. For the present pilot project, it would be fair to negotiate for an extended warranty of upto 2 years for the machines from the date of installation. Being a pilot project, the machines should be operated by the manufacturer during the first year of operation and payment of the annual operating cost can be done on mutually agreed terms. Suitable manpower of DCB may be trained during the first year of operation of the machines, to enable independent operation for subsequent years. Further, the operating cost for the machines may be shared between DCB and Station HQ, Delhi Cantt on a pro-rata basis.

12. In order to achieve a 'Zero Waste' scenario in Delhi Cantonment, it would be essential to dispose off the processed material i.e. compostable material and the SCF (Segregated Combustible Fractions). The compostable material is approximately 10% of the input waste, which can be used by DCB after three weeks of natural curing into compost. The SCF is approximately 15% of the input waste (after removal of recyclable material at the pre-sorting stage, which can be conveniently done by rag pickers for the independent and permitted disposal at their level to the recyclers). As per the guidelines of MoHUA, the SCF can be disposed off to cement plants. The existing rate for transportation of 5MT of unprocessed waste from Delhi Cantt to Okhla, located at one way distance of 35 Km, is Rs. 7,150/-. Besides this, there are also additional dumping charges @ 2,950/- per MT, which together

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will amount to Rs. 21,900/- for the final disposal of 5 MT of unprocessed waste. There are no cement plants buying SCF within 60-70 Km radius and such plants could be located far away. It is proposed to offer the same rate of Rs. 7150/- per 5 MT of SCF to the supplier of XAPER machines, for the transportation and disposal of the SCF to any cement plant. This is considering the fact that they are likely to have their own vehicle fleet or a tie-up with other agencies and cement plants and therefore economies of scale would be possible. Hence, the amount proposed to be paid per annum for disposal of SCF can be restricted to 7.72 Lacs for 10 TPD and Rs. 15.44 Lacs for 20 TPD XAPER machine, respectively.

13. Based on interaction with other agencies who are already using XAPER machines, the estimated annual operating cost for the machines would be as under:-

S. No.	Component of Annual Cost	10 TPD XAPER	20 TPD XAPER
1	Manpower Cost	Rs. 15,85,416/- (1 x Supervisor & 6 x Technicians)	Rs. 20,26,416/- (1 x Supervisor & 8 x Technicians)
2	Disposal cost of SCF	Rs. 7,72,200/-	Rs. 15,44,400/-
Total Annual Operating Cost		Rs. 23,57,616/-	Rs. 35,70,816/-

14. The total annual operating cost for 3 x 20 TPD machines and 1 x 10 TPD machine would be approximately Rs. 1.31Cr (refer Appendix 'F'). This is likely to escalate @ 7% per annum till the expected life of 10 years for the machines. However, the cost of electricity consumed for the operation of these machines would be borne by DCB.

15. It is to be seen that handing over of O&M to the manufacturer for the initial period of one year will give a huge saving to the Board, as explained in preceding paragraphs. It will also help in training of the Board staff to handle the machinery and processes for future operations.

16. The manufacturer must enter into an agreement with DCB, with suitable penal clauses, to cover any incident of default for the full and final disposal of the entire output of the machines, to achieve the desired 'Zero Waste' scenario in Delhi Cantt. However, DCB should retain the right to take the entire compost generated as a result of the processing. The same should be provided in a ready to use form by the vendor after properly sieving and removing non compost material.

17. A survey was undertaken to study the existing infrastructure of DCB for installation of waste processing machines. It was discovered that the existing sheds on Tigris road, with

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minor modifications, can accommodate 2 x 20TPD machines and 1 x 10 TPD machines. Therefore, the civil works for the installation of only 1x20 TPD machine may have to be undertaken, at any suitable location within Delhi Cantt.

18. It is pertinent to mention that the following advantages will accrue due to the employment of 'Sorting cum Composting' technology as patented in the XAPER machines:-

(a) Need for segregation of waste at source can be done away with since the machines can process both segregated as well as mixed waste.

(b) Compliance to Hon'ble NGT/court directions, as regards segregation and decentralized processing of daily waste, would be achieved.

(c) The Sorting cum Composting technology provides high efficiency in mass reduction and is available at the lowest CAPEX, per ton of waste processing.

(d) In addition to the break even, there would be a saving of approximately 3 Cr. in the very 1st year of operation, and approximately 13 Cr per year for subsequent years of operation.

19. The Board vide CBR No 4, dated 18.06.21, while approving the budget for 2021-2022 (Revised) and 2022-2023 (Original), has already made the provision for the proposed expenditure of Rs. 7 Cr. and 6 Cr. respectively, for the procurement and installation of XAPER waste processing machines.

2. In the light of the foregoing and the latest recommendation received from the office of PSA, Govt. of India dated 29.06.2021, regarding the suitability of Version2 of XAPER machines, the Board may consider the procurement of 3 x 20 TPD and 1 x 10 TPD XAPER machines through the GeM portal. The Board may also accord sanction for other associated expenditure, i.e. one time cost of civil works for the installation of machines, the annual operating cost for the first year of operation and the AMC w.e.f. from the third year of operation for the machines.

Relevant file/documents placed on the table.

Chief Executive Officer

Delhi Cantonment

(SVR Chandra Sekhar)

Dated:September, 2021

Resolution

Considered. The Board analyzed the proposal in light of the above mentioned facts and has opined that the implementation of 'Sorting-cum- Composting' technology, as incorporated in XAPER machines, would lead to major savings to the exchequer, while simultaneously creating 'Zero Waste' environment in Delhi Cantonment. The Board further noted that the implementation of such technology would be in compliance to the directions of Hon'ble NGT/Courts and various other environment controlling agencies with regard to segregation, as well as, decentralized processing of fresh waste.

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The Board resolves that the said technology may be implemented in phases with first phase involving installation of one 20 TPD XAPER machine by 15 December, 2021 as a pilot project and the remaining machines thereafter. Future schedule of procurement of remaining 2 X 20 TPD and 1 X 10 TPD machines may be decided by the CEO as per the requirement. The Board further authorized CEO, Member Secretary to incur the necessary expenditure towards procurement, installation and operationalization of 3 x 20 TPD and 1 x 10 TPD XAPER machines, including all other associated expenditure towards achieving zero waste environment in future.

1. Brig. RK Chaudhary
President Cantonment Board

--Sd/-

2. Sh. SVR Chandra Sekhar
CEO, Member Secretary

-----Sd/-----

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RA Number: GEM/2021/RA/91
Dated: 14-10-2

RA Document

RA Details	
RA Technical End Date/Time	04-11-2021 19:00:00
RA Opening Date/Time	04-11-2021 19:30:00
RA Life Cycle (From Publish Date)	90 (Days)
RA Offer Validity (From End Date)	30 (Days)
Ministry/State Name	Ministry Of Defence
Department Name	Department Of Defence
Organisation Name	Dg Of Defence Estate
Office Name	*****
Total Quantity	1
Item Category	Cleantech (PAC Only)
Average Turnover (Last 3 Years)	110 Lakh (s)
OEM Average Turnover (Last 3 Years)	222 Lakh (s)
Experience Criteria	3 Year (s)
MSE Exemption for Turnover	Yes
Startup Exemption for Turnover	Yes
Document required from seller	Experience Criteria,Past Performance,Bidder Turnover,Certificate (Requested in ATC),OEM Authorization Certificate,OEM Annual Turnover,Additional Doc 1 (Requested in ATC),Additional Doc 2 (Requested in ATC),Additional Doc 3 (Requested in ATC),Additional Doc 4 (Requested in ATC) *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by buyer
Time allowed for Technical Clarifications during technical evaluation	7 Days
Past Performance	10 %
Inspection Required (By Empanelled Inspection Authority / Agencies pre-registered with GeM)	No
Evaluation Method	Total value wise evaluation
EMD Detail	
Required	No

ePBG Detail

Required	No
Splitting	
RA splitting not applied.	
Details of the Competent Authority approval for PAC	
Competent Authority Approval document for PAC : View Document	
Name of Competent Authority	MOHUA
Designation of Competent Authority	Senior Advisor/Scientist 'H'
Office / Department / Division of Competent Authority	Principal Scientific Adviser to the Govt. of India
CA Approval Number	29.06.2021
Competent Authority Approval Date	2021-09-29 00:00:00
Brief Description of the Approval Granted by Competent Authority	The Office of Principal Scientific Adviser to the Government of India has installed version 1 and version 2 of the XAPER machine by E3 Waste solutions, Jalandhar. The version 2 is a improved version of the first machine. Following are the specifications of the Version 2 of XAPER machine: Capacity: 100 Tonnes per day,Percentage Mass reduction of waste: 85% ,Automatic MSW Feeding Conveyor ,Recyclable Receptacle to avoid littering of recyclables ,Recyclable-sorting conveyor,Conveyor for RDF/Combustible ,Conveyors to transport the bio-dried compostable ,Compost Curing Zone ,Horizontal Compaction System for bailing the combustible material to avoid human intervention. As of now the machine is function satisfactorily and Delhi Cantonment may want to consider installing the version 2 of the XAPER machine to segregate a treat fresh waste.

1. The minimum average annual financial turnover of the bidder during the last three years, ending on 31st March of previous financial year, should be as indicated above in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the bidder is less than 3-year-old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.

2. If the bidder is a Micro or Small Enterprise as per latest definitions under MSME rules, the bidder shall be exempted from the requirement of "Bidder Turnover" criteria and "Experience Criteria". If the bidder is OEM of the offered product it would also be exempted from the "OEM Average Turnover" criteria. In case any bidder is seeking exemption from Turnover / Experience Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer.

3. If the bidder is a Startup, the bidder shall be exempted from the requirement of "Bidder Turnover" criteria and "Experience Criteria". If the bidder is OEM of the offered products, it would also be exempted from the "OEM Average Turnover" criteria. In case any bidder is seeking exemption from Turnover / Experience Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer.

4. Experience Criteria: In respect of the filter applied for experience criteria, the Bidder or its OEM {themselves or through reseller(s)} should have regularly, manufactured and supplied same or similar Category Products to any Central / State Govt Organization / PSU / Public Listed Company for number of Financial years as indicated above in the bid document before the bid opening date. Copies of relevant contracts to be submitted along with bid in support of having

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supplied some quantity during each of the Financial year. In case of bunch bids, the category of primary product having highest value should meet this criterion.

5. OEM Turn Over Criteria: The minimum average annual financial turnover of the OEM of the offered product during last three years, ending on 31st March of the previous financial year, should be as indicated in the bid document.

Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with bid. In case the date of constitution / incorporation of the OEM is less than 3 year old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.

6. Past Performance: The Bidder or its OEM {themselves or through re-seller(s)} should have supplied same or similar Category Products for 10% of bid quantity, in at least one of the last three Financial years before the bid opening date to any Central / State Govt Organization / PSU / Public Listed Company. Copies of relevant contracts (proving supply of cumulative order quantity in any one financial year) to be submitted along with bid in support of quantity supplied in relevant Financial year. In case of bunch bids, the category related to primary product having highest bid value should meet this criterion.

7. Short Duration Bid has been published by the Buyer with the approval of the Competent authority due to Emergent procurement of critical products/services.

Cleantech (1 pieces) (Under PAC)

Make	xaper
Model	xaper-20tpd
Brand Type	Registered Brand

Technical Specifications

[* As per GeM Category Specification](#)

Specification	Specification Name	Bid Requirement (Allowed Values)
Sector and Industry	Sector/Industry	Manufacturing, Science and Technology, Services
	Aligned Ministry	Ministry of Earth Sciences, Ministry of Environment, Forests and Climate Change, Ministry of Housing and Urban Affairs, Ministry of Science and Technology

Additional Specification Documents

Consignee/Reporting Officer and Quantity

S.No.	Consignee/Reporting Officer	Address	Quantity	Delivery Days
1	*****	*****NEW DELHI	1	30

Buyer Added Bid Specific Additional Terms and Conditions

- Without prejudice to Buyer's right to price adjustment by way of discount or any other right or remedy available to Buyer, Buyer may terminate the Contract or any part thereof by a written notice to the Seller, if:
 - The Seller fails to comply with any material term of the Contract.
 - The Seller informs Buyer of its inability to deliver the Material(s) or any part thereof within the stipulated Delivery Period or such inability otherwise becomes apparent.
 - The Seller fails to deliver the Material(s) or any part thereof within the stipulated Delivery Period and/or to

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replace/rectify any rejected or defective Material(s) promptly.

iv) The Seller becomes bankrupt or goes into liquidation.

v) The Seller makes a general assignment for the benefit of creditors.

vi) A receiver is appointed for any substantial property owned by the Seller.

vii) The Seller has misrepresented to Buyer, acting on which misrepresentation Buyer has placed the Purchase Order on the Seller.

2. While generating invoice in GeM portal, the seller must upload scanned copy of GST invoice and the screenshot of GST portal confirming payment of GST.
3. Buyer Added text based ATC clauses

APPENDIX A TO THE NOTICE

1. Procurement of XAPER machines for decentralized processing of Solid Waste to achieve 'Zero Waste' scenario in Delhi Cantonment.

Name of work	Procurement of XAPER machines for decentralized processing of Fresh Solid Waste to achieve 'Zero Waste' scenario in Delhi Cantonment
Estimated Cost	Rs.2,25,00,000/- (two crore twenty five lac only)
Cost of tender	Rs.5,000/- (One Thousand Only)
Earnest money	Rs.3,00,000/- (Three Lac Only)
Amount of Bank solvency certificate	Rs.70,00,000/- (Seventy lac Only)

2. The tender shall be accompanied by certified true copy of power of Attorney in favour of the signatory to the tender documents. In case the signatory is himself the sole proprietor, an affidavit on stamp paper of appropriate value to this effect stating that he has authority to bind the firm in all matters pertaining to the contract including the Arbitration clause, shall be attached. The person signing the tender on behalf of another partner(s) or on behalf of a firm or company shall attach with the tender a proper power of Attorney duly executed in his favour by such other person or by all the partner(s) or in accordance with the constitution of the company, stating that he has authority to bind such other person(s) or the firm or the company as the case may be, in all matters pertaining to the contract including the Arbitration clause.

ELIGIBILITY CRITERIA : DOCUMENTS TO BE UPLOADED FOR EVALUATING TECHNICAL RESPONSIVENESS OF THE BIDS (THE UNDERMENTIONED DOCUMENTS NEEDS TO BE UPLOADED FOR TECHNICAL EVALUATION OF TECHNICAL RESPONSIVENESS OF BIDS).

1. Scanned copy of application on the letter pad of the company in favour of Chief Executive Officer, Delhi Cantonment Board requesting for issue of tender document, Appendix 'I'.

2. The **Earnest Money Deposit** for the amount given in Appendix 'A' (Pa

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no.1) shall be deposited online in the Cantt Board bank account through RTGS/ NEFT. The details of bank account are as given below and scanned copy of **bank transfer details** must be uploaded as **Appendix 'A'** (Exemption will be applicable for NSIC/MSME registered agencies on this account).

Account Name : IChief Executive Officer, Delhi Cantonment Board
 Name of Bank : Union Bank of India
 Bank Account No. : 352701110050001
 IFSC Code : UBIN0535273

Branch : Delhi Cantt - 110010

3. The **Tender Fee** for the amount given in Appendix 'A' (Page No.1) shall be deposited online in the Cantt Board bank account through RTGS/ NEFT. The details of bank account are as given below and scanned copy of **bank transfer details** must be uploaded as **Appendix 'III'**. (Exemption will be applicable for NSIC/MSME registered agencies on this account).

Account Name : Chief Executive Officer, Delhi Cantonment Board
 Name of Bank : Union Bank of India
 Bank Account No. : 352701110050001
 IFSC Code : UBIN0535273
 Branch : Delhi Cantt - 110010

4. Scanned Copy of Firm registration certificate, Appendix 'IV'.
5. Scanned Copy of GST certificate, Appendix 'V'.
6. Scanned Copy of Pan No. of the company, Appendix 'VI'.
7. Scanned Copy of The firm/company should be Original Equipment Manufacturer (OEM) or its Authorized Service Providers/ supply and to enclose a copy for the same with their quotation (authorization letter from parent OEM Company of Sharp Make Photocopiers or its authorized representative in India issued not before months from the date of issue of this tender must be submitted), Appendix 'VII'.
8. Scanned copy of Solvency certificate issued by any Nationalized Banks for the amount given in Appendix the notice of tender on page no.1 of documents, Appendix 'VIII'.
9. Scanned copy of certificate from contractor for Acceptance of tender terms and conditions of the contract to be prepared on contractor letter pad, Appendix 'IX'.
10. Scanned copies of Partnership deed documents in case of partnership firm, Appendix 'X'.
11. Scanned certified true copy of Power of Attorney as mentioned in clause 2 on page No.01, if applicable, Appendix 'XI'.
12. Scanned copy of declaration from the intending bidder that their firm is not blacklisted in any Central Govt./ULBs or any other Govt. Department, Appendix 'XII'.
13. Scanned copy of proof of Average Annual Turnover (certified by CA) during last three years (financial starting 2017-18, 2018-19, 2019-20) which should not be less than the estimated value Appendix 'XIII'.
14. Scanned copy of proof of experience be uploaded of having successfully completed similar works during last 7 years ending last day of month previous to the one in which applications are invited should be either of the following, **Appendix "XII"**
- Three similar completed works costing not less than the amount equal to **40%** of the estimated cost.
 - Two similar completed works costing not less than the amount equal to **50%** of the estimated cost.
- c). One similar completed work containing not less than the amount equal to 80% of the estimated cost.

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Note: (1) The price bid of only those contractors shall be considered for opening who's bids are found responsive and have uploaded above documents complete in all respect. No misunderstanding of this account shall be entertained afterwards. The bids of agencies providing incomplete documents shall be summarily rejected.

(2) The Earnest money and tender document fee needs to be deposited in the tender box upto time fixed for close of bids. The Earnest money deposit and tender document fee shall be submitted in form of Demand Draft, Bankers Cheque, Term Deposit receipt drawn in favour of Chief Executive Officer, Delhi Cantonment from any of the Nationalized banks. Scanned copy of Earnest money deposit and tender fee deposit needs to be also uploaded while submission of bids positively as mentioned at Sr No.(2) & (3) above.

(3) The price bid of agencies whose documents are found complete and in order shall be opened immediately after scrutiny of papers.

(4) In case, any firm submits any forged document in support of the tender requirement and if proved at any stage, the firm would be debarred for minimum five years and EMD/Performance security submitted by the firm shall be forfeited. No correspondence whatsoever will not be entertained in this regard.

(5) The firm to whom tender will be awarded, will have to deposit the performance security equal to 03% of the total amount tentatively arrived till such time the period of contract expires or for a period of one year. If the services are not found to be satisfactory the performance security is liable to be forfeited. No interest will be paid on performance security.

(6) In case of breach of any terms and conditions attached to this contract, Performance Security Deposit of the agency will be liable to be forfeited besides annulment of the contract.

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ADDITIONAL TERMS & CONDITIONS

THE UNDERMENTIONED DOCUMENTS NEEDS TO BE UPLOADED FOR TECHNICAL EVALUATION OF RESPONSIVENESS OF BIDS)

Company should provide scanned copy of certificate from contractor for Acceptance of following tender terms and conditions of contract to be prepared on contractor letter pad and uploaded with the bid.

1. Company should provide Warranty for all the goods/items & comprehensive maintenance of all the equipment shall be for 24 months.
2. Operating Cost: (1 Supervisor & 8 Technicians) + (Disposal Cost) will borne by the DCB as per circular attached. You will be required to pay y workmen as per minimum wages act including the enhancement of wa from time to time. You will also comply with the labour and statut requirements viz payment of ESI, EPF & GST etc. and payment to be made cheque and details thereof to be submitted with the bill for payment.
3. Company should quote including CMC (comprehensive maintena contract) of 03 year after completion of warranty period.
4. Disposal Cost: Approved vendor may dispose off SCF (Segrega Combustible Fractions) to cement plants and Rs.7150/- per 5 MT of SCF will paid to the supplier /OEM of the machines for the transportation and dispose the SCF to any cement plant under their own arrangement. (Payment will made by DCB on quarterly basis).
5. The cost of electricity consumed for the operation of these machines wc be borne by DCB.
6. The manufacturer must enter into an agreement with DCB with suite penal clauses, to cover any incident of default for the full and final disposa the entire output of the machines, to achieve the desired 'Zero Waste' sceni in Delhi cantt. However, DCB retain the right to take the entire comp

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generated as a result of the processing. The same should be provided in ready to use form by the vendor after properly sieving and removing all compost material.

7. Civil works & Electrical for the installation will be borne by the DCB at the submission of drawing etc. by the vendor.
8. Vendor/OEM ensure before quoting that they (vendor/oem) agree to the term and condition.
9. The supply/installation/commissioning etc. is to be completed by 15.12.2021.
11. The department may issue amendment / errata to the terms and conditions etc. before due date of submission of tender. The tenderers are required to read the documents etc.
12. If the successful Bidder fails to fulfill his obligations under this Tender in Non-adherence to terms and conditions contained in this Tender, the Delhi Cantonment Board after due notice to the Supplier may blacklist the firm. In such events, the Contract will stand terminated and the EMD/Performance Securities of such Firm shall be forfeited to Delhi Cantonment Board.
13. **Despatch instructions :** Stores are required to be delivered at the Delhi Cantonment Board premises on free delivery to the consignee's premises on a freights/transportation paid basis.
14. **GUARANTEE/ WARRANTY:** The contractor shall guarantee that the stores, articles sold/supplied to the purchaser under this contract shall be of the best quality and workmanship and new in all respects and shall be strictly in accordance with the specification and particulars contained/ mentioned in the Tender enquiry. The contractor shall guarantee that the said goods/stores/articles would continue to conform to the description and quality aforesaid for a period of twelve months, from the date of installation of the said goods/stores/articles to the purchaser and notwithstanding the fact that the Purchaser (Inspector) may have inspected and /or approved the said goods /stores/articles, if during the aforesaid period of 12 months the said stores/goods/ articles be discovered not to conform to the description and quality aforesaid or not giving satisfactory performance or have deteriorated, the decision of the purchaser in that behalf shall be final and binding on the contractor and the purchaser shall be entitled to call upon the contractor to rectify the goods/stores/articles or such portion thereof as is found to be defective by the purchaser within a reasonable period or such specified period as may be allowed by the purchaser in his discretion on an application made thereof by the contractor at such an event, the above mentioned warranty period shall apply to the goods/stores/ articles rectified from the date of rectification thereof. In case of failure of the contractor to rectify or replace the goods etc., within specified time, the purchaser shall be entitled to recover the cost with all expenses incurred by the contractor for such defective stores.
15. **PATENT RIGHTS:** The Supplier shall indemnify the Purchaser against all third party claims of infringement of patent, trademark, or industrial design right arising from use of the Goods of any part thereof.

16. **TERMINATION FOR DEFAULT:**

16.1 The Purchaser may, without prejudice to any other remedy for breach of the Contract, by written notice of default sent to the Supplier, terminate the Contract in whole or in part.

(a) If the Supplier fails to deliver any or all of the Goods within the time period(s) i.e. 15.12.2021, or an extension thereof granted by the purchaser pursuant, or

(b) If the Supplier fails to perform any other obligation(s) under the Contract.

16.2 In the event the Purchaser terminates the Contract in whole or in part

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pursuant to para 13.1, and without prejudice to the Purchaser's other remedies the Purchaser may procure, upon such terms and in such manner as it deems appropriate at the risk & cost of the agency, Goods or Services similar to those undelivered or unperformed and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods. However, the Supplier shall continue performance of the Contract to the extent not terminated.

17. FORCE MAJEURE: Notwithstanding the provisions the Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

17.2 For purposes of this clause "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault of negligence and not foreseeable. Such events may include but are not restricted to, acts of the Purchaser either in its sovereign or contractual capacity, wars or sovereign or contractual capacity wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

17.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practicable and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

18. TERMINATION FOR INSOLVENCY:

The Purchaser may at any time terminate the Contract by giving written notice to the Supplier, without compensation to the Supplier, if the Supplier becomes bankrupt or otherwise insolvent (which events shall of themselves be a breach of the contract on the part of the supplier), provided such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Purchaser.

19. TERMINATION FOR CONVENIENCE:

19.1 The Purchaser may, by written notice sent to the Supplier, terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of work under the contract is terminated and the date upon which such termination becomes effective.

19.2 The goods that are complete and ready for shipment within 20 days after the Supplier's receipt of notice of termination shall be purchased by the Purchaser at the Contract terms and prices. For remaining Goods the Purchaser may elect:

(a) To have any portion completed and delivered at the Contract terms and prices; and/or

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(b) To cancel the reminder and pay to the Supplier an agreed amount for partially completed Goods and for materials and parts previously procured by the Supplier.

20. **RESOLUTION OF DISPUTE**

20.1 The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

20.2 If, after thirty (30) days from the commencement of such informal negotiations, the Purchaser and the Supplier have been unable to resolve amicably a Contract dispute either party may require that the dispute be referred to Arbitration, The President Cantonment Board will be the authority to appoint sole arbitrator whose decision shall be final, binding & conclusive.

20.3. Venue of Arbitration shall be at Delhi

21. Performance Security : The contractor shall be required to submit 03% of the cost of completion of work as performance security (including amount of earnest money deposit) in the form of Bank draft/irrevocable bank Guarantee from Nationalized Bank valid for period of 01 year after date of completion of work (defect liability period). The performance security would be released after expiry of defect liability period. In case of any defects observed in the work done by the contractor the Store-Procurement-incharge will notify the defects to the contractor giving reasonable time as per his discretion for rectification of defects and if contractor fails to rectify the defects within stipulated period the Board shall be at liberty to get the defects rectified from any agency of its choice at the risk and cost of the contractor and expenditure incurred in this regard would be adjusted from the performance security.

22. **PAYMENT INSTRUCTIONS**

- a) Payment will be made on completion of the complete supply or specified otherwise.
- b) After inspection and acceptance of stores by the authorized rep/Board detailed by the consignee or his superior headquarters.
- c) Prescribed pre-stamped per receipted bills in triplicate will be submitted to the paying authority after fulfilling (a) and (b) above.
- d) Payment will be made through A/C Payee cheque only.
- e) Where GST or any other taxes is charged, the supplier will quote his GST Registration Number and endorse the following certificate on the bill.

"Certified that the goods on which GST has been charged have not been exempted under GST Act or the rules made thereunder. The charges levied on account of GST of the goods supplied are correct under the provisions of the Act or the rules made thereunder. And/or that the taxes included in the bill has actually been paid by the supplier.

CIRCULAR AGENDA

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Procurement of XAPER Machines for decentralized processing Solid Waste to achieve 'Zero Waste' scenario in Delhi Cantonment

1. To consider the report of Col (Retd.) PK Dogra, Consultant, DCB w regard to procurement of XAPER machines for decentralized processing solid waste management to achieve 'Zero Waste' scenario in D Cantonment. As per the report;

1. *The management of municipal solid waste (MSW) has been a vex problem, involving huge expenditures in terms of manpower, vehic and environmental cost. Efforts have been made at various le throughout the country to arrive at possible solutions for processing MSW at the most economical cost. The centralized composting as as waste to energy plants setup in NCR are operating at sub opti capacity for want of proper segregation of MSW into wet and streams. Accordingly, directions have been issued by Hon'ble NGT strict adherence to Solid Waste Management Rules 2016, which only insist on 100% segregation at source but also impel the setting of decentralized facilities for processing of MSW, such that no par daily waste should have to be transported and dumped at far fl landfills.*
2. *Extensive efforts have been made by DCB during the last three ye to carry out market survey and study the available technologies decentralized processing of MSW. Segregation of waste at source been a challenging problem which despite best efforts,particularly terms of spreading public awareness, still leaves much to be desi. Hence, a technological solution to solve the problem of segregation source together with suitable machines for decentralized processing daily waste is being sought to date.*
3. *In the existing system of management of MSW, the entire waste a door to door collection and removal of the recyclables, is transpor to Okhla for processing/dumping at the landfill site on a daily basis. is being done at a huge cost of approximately 18 Cr per year, involv the employment of large number of vehicles and manpower. intangible environmental costs in terms of excessive flow vehicles, the associated air pollution and foul smell caused on acco of the same, are over and above.*
4. *The following technologies for the decentralized processing of M have been studied over time and evaluated on relative merit basis arrive at the best solution for DCB:-*
 - (a) *Drum Composting after manual segregation The MCDs in D are using drum composting machines of 1 TPD capacity, which t the **input in the form of segregated wet waste only**. Th machines have been found to be expensive, the capital cost of machine being approximately 35Lacs as quoted in GeM portal. operating cost per ton of processing per day is approximately 2800/-, which translates into an annual cost of approximately 10 L*

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for the daily processing of only one ton of segregated waste. Both capital as well as operating cost are quite high and there is a problem of excessive foul smell due to the leachate generation.

(b) Biomethanation. A few machines of 5 TPD capacity have been deployed by the MCDs. The capital cost per machine is approximately 3.6 Cr. as quoted in the GeM portal. These machines require 100% segregated wet waste only and there is a drop in performance in case of

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adulterants in the wet waste. These machines do not provide any solution for the handling of dry waste. The annual operating cost for 5TPD machine is approximately Rs. 30 Lacs.

(c) Sorting cum Composting Technology. This is a unique patented technology which permits the processing of **segregated, as well as mixed waste** (with no requirement of segregation at source). The mixed waste is segregated into biodegradable and non-biodegradable fractions automatically by the machine using this technology. The dry component of the waste, after mechanical segregation by the machine, emerges out as RDF (Refuse Derived Fuel), which is suitable for use by cement plants. The wet waste is converted into compostable material on a daily basis which cures naturally into compost in three weeks' time. The entire process is aerobic i.e. in the presence of oxygen and there is no generation of foul smelling leachate. Also there are no harmful emissions during the processing of waste. A prototype of 10 TPD capacity machine using this technology, was trial evaluated by DCB during 2018-19. An average reduction of 75% from input to output stage was achieved during the calibrated trials of the machine. **The capital as well as the operating cost of this technology have been found to be the lowest among various decentralized processing technologies.** However, the decision to pursue this technology could not be taken at that stage since the commercial models of the same were still awaited.

(d) A comparative analysis of the above technologies is given at Appendix 'A'.

5. The office of Principal Scientific Advisor (PSA) to Govt. of India, had carried out extensive research for identifying suitable technology for processing of MSW in their 'Waste to Wealth' mission during the year 2019-20. After comparative evaluation of various technologies, they shortlisted and recommended the use of XAPER machines which employ the 'Sorting cum Composting technology', for the decentralized processing of fresh daily waste. The details of the same were received vide DPCC letter No. DPCC/WMC-II/PSA/SS/2020/3254-3261 dated 09.03.2020. Subsequently, Version 1 of XAPER machine was installed by the PSA in EDMC area at Shahdara in January 2020. The machine was operated for few months under the overall directions from PSA office. The Version 1 of XAPER had an underground configuration which affected its efficiency adversely due to inadequate aeration.

6. A team of DCB officials headed by Jt. CEO visited the site where Version 1 of XAPER machine was deployed at Shahdara, in

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October 2020. Due to certain infrastructural modifications, which were underway as per the orders of the PSA office, the operation of the machine had been temporarily halted. However, after checking various aspects it was noted by the visiting team that the machine would require certain modifications at the input and output stages to be considered worthy for meeting the requirements of DCB. On interaction with the PSA office, it was learnt that they had already asked the manufacturer to make a few design changes to achieve higher degree of efficiency and automation for user friendly operation.

7. The Version 2 of XAPER machine incorporates all necessary improvements and is in an over-ground configuration

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with higher efficiency. It was installed as per the directions of the PSA Jafrabad area of EDMC, in April 2021. The PSA office has intimated vide the email dated 29.06.2021 that 'the Version 2 of XAPER is functioning satisfactorily and Delhi Cantonment may want to consider installing Version 2 of the XAPER machine to segregate and treat fresh waste'. Salient details of this improved design of the machine, are given in the email placed at Appendix 'B'. It is noteworthy that as per the analysis of technology by the PSA, the mass reduction achieved from the input to output stage is of the order of 85% as against 75% recorded during the trials of the prototype of the machine by DCB.

8. The Integrated HQ of MOD (Army)/QMG Branch were also evaluated various options for the processing of MSW by Army units. During July 2020 officers from QMG branch came for an interaction at DCB to discuss the same. The details of the trials of 10 TPD XAPER were shared with them and they were further advised to interact with the PSA office for the analysis of various other available technologies. The Integrated HQ of MOD (Army)/QMG Branch vide their letter No. 00159/Misc/Coord/Adm&Coord dated 01.12.2020 has intimated that the COAS (Chief of Army Staff) has approved the option of utilizing XAPER machine for waste management (Refer Appendix 'C').

9. The average daily waste generated in Delhi Cantonment area, including the area under the management of Army, is approximately 68 MT. It is envisaged that, subject to approval by the Board, as per the recommendation made by the PSA, 3x20 TPD XAPER machines and 1x10 TPD XAPER machine would together provide a processing capacity of 70 MT, which would adequately meet the requirement.

10. The 10 TPD and 20 TPD XAPER machines, which employ the patent sorting cum composting technology, are available for procurement through the GeM portal. The quotations for these machines are given at Appendix 'D' and 'E' respectively. It is recommended to install the XAPER machines in a phased manner, in that, 2 x 20 TPD machines may be installed in Phase I and after successful operation of the same the remaining 1 x 20 TPD and 10 TPD machine may be installed.

11. It is pertinent to mention that the operating cost for the machines and the AMC have not been indicated in the quotes available in the GeM portal.

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is therefore recommended that these should be finalized through a meeting with the manufacturer. For the present pilot project, it would be fair to negotiate for an extended warranty of upto 2 years for the machines from date of installation. Being a pilot project, the machines should be operated by the manufacturer during the first year of operation and payment of the annual operating cost can be done on mutually agreed terms. Suitable manpower DCB may be trained during the first year of operation of the machines to enable independent operation for subsequent years. Further, the operational cost for the machines may be shared between DCB and Station HQ, Delhi Cantt on a pro-rata basis.

12. In order to achieve a 'Zero Waste' scenario in Delhi Cantonment, it would be essential to dispose off the processed material i.e. compostable material and the SCF (Segregated Combustible Fractions). The compostable material is approximately 10% of the input waste, which can be used by DCB after three weeks of natural curing into compost. The SCF is approximately 15% of the input waste (after removal of recyclable material at the pre-sorting stage, which can be conveniently done by rag pickers for the independent and permitted disposal at their level to the recyclers). As per the guidelines of MoHUA, the SCF can be disposed off to cement plants. The existing rate of transportation of 5MT of unprocessed waste from Delhi Cantt to Okhla located at one way distance of 35 Km, is Rs. 7,150/-. Besides this, there are also

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additional dumping charges @ 2,950/- per MT, which together will amount to Rs. 21,900/- for the final disposal of 5 MT of unprocessed waste. There are no cement plants buying SCF within 60-70 Km radius and such plants could be located far away. It is proposed to offer the same rate of Rs. 7150/- per 5 MT of SCF to the supplier of XAPER machines, for the transportation and disposal of the SCF to any cement plant. This is considering the fact that they are likely to have their own vehicle fleet or a tie-up with other agencies and cement plants and therefore economies of scale would be possible. Hence, the amount proposed to be paid per annum for disposal of SCF can be restricted to 7.72 Lacs for 10 TPD and Rs. 15.44 Lacs for 20 TPD XAPER machine, respectively.

13. Based on interaction with other agencies who are already using XAPER machines, the estimated annual operating cost for the machines would be as under:-

S. No.	Component of Annual Cost	10 TPD XAPER	20 TPD XAPER
1	Manpower Cost	Rs. 15,85,416/- (1 x Supervisor & 6 x Technicians)	Rs. 20,26,416/- (1 x Supervisor & 8 x Technicians)
2	Disposal cost of SCF	Rs. 7,72,200/-	Rs. 15,44,400/-
Total Annual Operating Cost		Rs. 23,57,616/-	Rs. 35,70,816/-

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14. The total annual operating cost for 3 x 20 TPD machines and 1 x 10 TPD machine would be approximately Rs. 1.31Cr (refer Appendix 'F'). This is likely to escalate @ 7% per annum till the expected life of 10 years for the machines. However, the cost of electricity consumed for the operation of these machines would be borne by DCB.

15. It is to be seen that handing over of O&M to the manufacturer for the initial period of one year will give a huge saving to the Board, as explained in preceding paragraphs. It will also help in training of the Board staff to handle the machinery and processes for future operations.

16. The manufacturer must enter into an agreement with DCB, with suitable penal clauses, to cover any incident of default for the full and final disposal of the entire output of the machines, to achieve the desired 'Zero Waste' scenario in Delhi Cantt. However, DCB should retain the right to take the entire compost generated as a result of the processing. The same should be provided in a ready to use form by the vendor after properly sieving and removing non compost material.

17. A survey was undertaken to study the existing infrastructure of DCB for installation of waste processing machines. It was discovered that the existing sheds on Tigris road, with minor modifications, can accommodate 2 x 20TPD machines and 1 x 10 TPD machines. Therefore, the civil works for the installation of only 1x20 TPD machine may have to be undertaken, at any suitable location within Delhi Cantt.

18. It is pertinent to mention that the following advantages will accrue due to the employment of 'Sorting cum Composting' technology as patented in the XAPER machines:-

(a) Need for segregation of waste at source can be done away with since the machines can process both segregated as well as mixed waste.

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(b) Compliance to Hon'ble NGT/court directions, as reg:

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segregation and decentralized processing of daily waste, would be achieved.

(c) The Sorting cum Composting technology provides high efficiency in mass reduction and is available at the lowest CAPEX, per ton of waste processing.

(d) In addition to the break even, there would be a saving of approximately 3 Cr. in the very 1st year of operation, and approximately 13 Cr per year for subsequent years of operation.

19. The Board vide CBR No 4, dated 18.06.21, while approving the budget for 2021-2022 (Revised) and 2022-2023 (Original), has already made the provision for the proposed expenditure of Rs. 7 Cr. and 6 Cr. respectively, for the procurement and installation of XAPER waste processing machines.

2. In the light of the foregoing and the latest recommendation received from the office of PSA, Govt. of India dated 29.06.2021, regarding the suitability of Version 2 of XAPER machines, the Board may consider the procurement of 3 x 20 TPD and 1 x 10 TPD XAPER machines through the e-procurement portal. The Board may also accord sanction for other associated expenditure i.e. one time cost of civil works for the installation of machines, the annual operating cost for the first year of operation and the AMC w.e.f. from the third year of operation for the machines.

Relevant file/documents placed on the table.

Chief Executive Officer
Delhi Cantonment
(SVR Chandra Sekhar)

Dated:September, 2021

Resolution

Considered. The Board analyzed the proposal in light of the above mentioned facts and has opined that the implementation of 'Sorting-cum- Composting' technology, as incorporated in XAPER machines, would lead to major savings to the exchequer, while simultaneously creating 'Zero Waste' environment in Delhi Cantonment. The Board further noted that the implementation of this technology would be in compliance to the directions of Hon'ble NGT/Courts and various other environment controlling agencies with regard to segregation, as well as, decentralized processing of fr waste.

The Board resolves that the said technology may be implemented in phases with first phase involving installation of one 10 TPD XAPER machine by 15 December, 2021 as a pilot project and remaining machines thereafter. Future schedule of procurement of remaining 2 X 20 TPD and 1 X 10 TPD machines may be decided by the CEO as per the requirement. The Board further authorized the Chief Member Secretary to incur the necessary expenditure towards procurement, installation and operationalization of 3 x 20 TPD and 10 TPD XAPER machines, including all other associated expenditure towards achieving zero waste environment in future.

1. Brig. RK Chaudhary
President Cantonment Board

--Sd/-

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2. Sh. SVR Chandra Sekhar
CEO, Member Secretary

-----Sd/-----

Disclaimer

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority Buyer Organization. Buyer organization is solely responsible for the impact of these clauses on the bidding process, outcome and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specification and / or terms and conditions governing the bid. Any clause incorporated by the Buyer such as demanding Tender Sample, incorporating any clause against the MSME policy and Preference to make in India Policy, mandating any Brand names or Foreign Certification, changing the default time period for Acceptance of material or payment timeline governed by OM of Department of Expenditure shall be null and void and would not be considered part of bid. Further any reference of conditions published on any external site or reference to external documents / clauses shall also be null and void. If any seller has any objection / grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller with days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

[This RA is also governed by the General Terms and Conditions.](#)

In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which share border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws.

---Thank You---

AGREEMENT

This agreement is made this..... day of January, 2022 between the Cantonment Board, Delhi Cantonment (hereinafter called the Delhi Cantonment Board) on one side and M/s E3 Waste Solutions (herein after called the Supplier/Contractor) on the other side and witnesses as under :

Contd/- page 2

Whereas the said supplier/Contractor has tendered for: **"Supply/fixing/installation/commissioning of Xaper machine for Decentralized Processing of Solid Waste to Achieve Zero Waste Scenario in Delhi Cantonment, Delhi Cantt"** through GeM portal and the rates quoted by the agency for above stated work is Rs.2,20,42,726/- for supply/fixing/installation/commission of one number of 20 TPD xaper machine (vide GeM RA No. GEM/2021/RA/91311) as per specifications, Terms & conditions provided in the GeM portal. The rates, terms & Conditions, scope of work and operating cost etc. of contractor have been accepted by the Board vide CB Resolution No.11 dated 29th November, 2021.

Now, therefore, this agreement Witnesses:

- Supplier/Contractor should provide Warranty for all the goods/items and comprehensive maintenance of all the equipment shall be for 24 months and 03 year CMC Services at his cost after completion of warranty period, which includes the cost of components/parts/wear & tear required for the maintenance/repair of the machine.
- Operating Cost:** This will be borne by DCB, as tabulated below. The Supplier/Contractor will be required to pay the workmen as per minimum wages act, including the enhancement of wages from time to time. The Supplier/Contractor will also comply with the labour and statutory requirements viz payment of ESI, EPF & GST etc. and payment to be made by cheque and details thereof to be submitted to Board. The operating cost would be escalated @ 7% per annum, till the expected life of 10 years of the machine, should the services of the Supplier/Contractor be taken beyond one year.

S. No.	Component of Annual Operating Cost	20 TPD XAPER
1	Manpower Cost	Rs. 20,26,416/- (1 x Supervisor & 8 x Technicians)
2	Disposal cost of SCF	Rs. 15,44,400/-
Total Annual Operating Cost		Rs. 35,70,816/-

- Payment schedule:** Bills for operational cost would be submitted quarterly with all bills, records of weights, disposal of SCF etc., satisfaction report of officials of Delhi Cantonment Board and any other documents specified by Chief Executive Officer or his authorised representative. Payment would be made after verification of the same.
- No person employed by the Supplier/Contractor in performance of this operation and maintenance shall have any claim of any permanent employment in Delhi Cantonment Board. The Supplier/Contractor shall be responsible for any injury or death of the persons employed or passers by in the facility and shall bear all costs of litigation or compensation to employed

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persons or passers by. The supplier / contractor shall at all times keep the premises hygienic and safe for his employees and passers by.

5. The Supplier/Contractor shall follow scrupulously all labour laws and fulfil all statutory obligations towards those employed by him and shall also be the primary employer in terms of statutory provisions. No child labour shall be engaged.
6. The Supplier/Contractor shall be responsible for smooth and continuous operation of the machine and shall ensure all security and safety arrangements of equipment are put in place on site. Supplier/Contractor shall be responsible for any mishap occurring on site and shall by himself compensate any injuries / loss to life or property arising out of operation of the machine. He shall ensure that the premises is kept in hygienic condition at all times and does not cause any nuisance to the public. Supplier/Contractor shall keep a record of all transactions at the premises as per proforma approved by the CEO, DCB or his authorised representative. The said records will be updated in real time and shall be available at all times for inspections at the premises.
7. **Disposal Cost:** Approved Supplier/Contractor may dispose off SCF (Segregated Combustible Fractions) to Govt. approved cement plants / waste to energy plant / waste to fuel plants and Rs.7150/- per 5 MT of SCF will be paid to the Supplier/Contractor /OEM of the machines for the transportation and disposal of the SCF to any Govt. approved cement plants / waste to energy plant / waste to fuel plant under their own arrangement. Payment will be made by DCB on quarterly basis. However no SCF shall be kept in the premises and shall be transported to the Govt. approved cement plant / waste to energy plant / waste to fuel plant. Arrangements for weighing of the waste and SCF etc. shall be made by the Supplier/Contractor for the purposes of evaluation of the work/payments.

The Supplier/Contractor would ensure that the SCF generated during the waste processing is disposed off in a form that is acceptable to cement plants/waste to energy/waste to fuel plants. Delhi Cantonment Board will not provide any financial assistance/facilities, other than the aforesaid transportation cost i.e.Rs.7150/- per 5 MT of SCF, for converting the SCF into usable form by any industry. Further, DCB would be free to choose the option of disposing off the SCF under its own arrangement to any target industry, at any time in future, without assigning any reason for the same.

8. **Cost of electricity:** The cost of electricity consumed for the operation of the machine (machine only) would be borne by DCB.
9. **Civil & Electrical works:** The 20 TPD Xaper machine would be installed in one of the existing sheds on Tigris Road, as indicated to the contractor/supplier. The Civil and Electrical works will be undertaken by DCB prior to installation as per the drawings to be submitted by the

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Supplier/Contractor and in consultation with the Delhi Cantonment Board Engineer. The expenditure for the same will be borne by the DCB.

10. **Schedule for Installation:** The supply/installation/commissioning should be completed on or before **07.02.2022** at the designated site in Delhi Cantonment area. However, any extension of this time frame due to any unforeseen circumstances, may be permitted at the discretion of the CEO, DCB.
11. **Despatch Instructions :** Stores/Goods/Machine are required to be delivered at the designated site in Delhi Cantonment area on a free delivery basis. The expenditure towards the installation of the machine, other than for civil and electrical works, would be borne by the Supplier/Contractor.
12. **Guarantee/ Warranty:** The Supplier/Contractor shall provide a comprehensive warranty for the machine upto a period of 24 months from the date of commissioning. The Supplier/Contractor shall guarantee that the stores, articles sold/supplied to the Delhi Cantt Board under this contract shall be of the best quality and workmanship and new in all respects and shall be strictly in accordance with the specification and particulars contained/mentioned in the Tender enquiry. The Supplier/Contractor shall guarantee that the said goods/stores /articles would continue to conform to the description and quality aforesaid for a period of 24 months (warranty period), from the date of installation of the said goods/stores/articles to the CEO Delhi Cantt Board and notwithstanding the fact that the CEO Delhi Cantt Board may have inspected and /or approved the said goods /stores/articles, if during the aforesaid period of 24 months the said stores/goods/ articles be discovered not to conform to the description and quality aforesaid or not giving satisfactory performance or have deteriorated, the decision of the CEO Delhi Cantt Board in that behalf shall be final and binding on the Supplier/Contractor and the CEO Delhi Cantt Board shall be entitled to call upon the Supplier/Contractor to rectify the goods/stores/articles, replacement of machine with new one or such portion thereof as is found to be defective by the CEO, Delhi Cantt Board within a reasonable period or such specified period as may be allowed by the CEO, Delhi Cantt Board in his discretion on an application made thereof by the Supplier/Contractor and in such an event, the above mentioned warranty period shall apply to the goods/stores/ articles rectified from the date of rectification thereof. In case of failure of the Supplier/Contractor to rectify or replace the goods etc., within specified time, the CEO Delhi Cantt Board shall be entitled to recover the cost with all expenses from the Supplier/Contractor for such defective stores. Supplier/Contractor should provide Warranty for all the goods/items and comprehensive maintenance of all the equipment for 24 months and 03 (three) year CMC Services will commence after completion of warranty period, which shall include the cost of components/parts/wear & tear required for the maintenance/repair of the machine.
13. **Comprehensive Annual Maintenance Contract (CAMC):** The CAMC would be applicable with effect from the 06th year of operation after the date

of commission, till which time Comprehensive Annual Maintenance shall be the responsibility of the Supplier/Contractor completely at their cost. The Supplier/Contractor agrees to offer a comprehensive AMC i.e. to include the cost of components/parts/wear & tear required for the maintenance/repair of the machine @7% of the cost of machine in the event his services are invited for the same.

14. Patent Rights: The Supplier/Contractor shall indemnify the CEO Delhi Cantt Board against all third party claims of infringement of patent, trademark, or industrial design right arising from use of the Goods or any part thereof.

15. Penalty Clause in relation to 'Zero Waste' : The Supplier/Contractor would ensure the full and final disposal of the output of the machine. However, DCB retains the right to take over the entire compost generated as a result of the processing, for which the Supplier/Contractor would provide the same in a ready to use form after due sieving. The Supplier/Contractor would store the segregated combustible fractions (SCF) in a covered compartment within the premises and make arrangements for the curing of the compostable material in the space provided to him. The premises would be subjected to inspection on a weekly basis for the disposal of the SCF and all other aspects of operation and maintenance of the machine and any default in this regard would invite a penalty @ 10% of the weekly operating cost of the machine for the first three defaults. In case of defaults after this, the CEO may in his discretion impose penalty upto 50% of weekly operating costs and on repeated defaults, may terminate the agreement at the risk and cost of the supplier/contractor without any further notice and confiscate any amounts due to the supplier/contractor. In case the machine is not functional or not optimally functional, amount would be deducted proportionately from the operating cost due to the supplier/contractor. In case of repeated failure of the machine, CEO, DCB may in his discretion impose penalty upto 2 times this proportionate amount and if deemed necessary terminate the contract in part or full at the risk and cost of the supplier/contractor and recover the amount from any monies due to the supplier/contractor.

16. The Supplier/Contractor understands that the project is of utmost importance to the citizens of Cantt area and to the Delhi Cantonment Board and shall take all due diligence in installing and operating the machinery. Any negligence or deficiency in performance will adversely effect the health and hygiene of the citizens and bring avoidable administrative difficulties and dispute to the Board. The supplier/contractor understands that there is no room for any error or deficiency of service and performance. CEO, DCB may at his discretion impose any penalty on the Supplier/Contractor in case of any deficiencies of performance or negligence by the Supplier/Contractor.

17. Termination for Default:

17.1 The CEO, Delhi Cantt Board may, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier/Contractor, terminate the Contract in whole or in part:-

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- (a) If the Supplier/Contractor fails to deliver any or all of the Goods within the time period(s) **i.e.07.02.2022**, or any extension thereof granted by the CEO, Delhi Cantt Board , or
- (b) If the Supplier/Contractor fails to perform any other obligation(s) under the Contract.

17.2 In the event the CEO, Delhi Cantt Board terminates the Contract in whole or in part, pursuant to para 17.1, and without prejudice to the CEO, Delhi Cantt Board's other remedies, the CEO, Delhi Cantt Board may procure, upon such terms and in such manner as it deems appropriate at the risk & cost of the Supplier/Contractor, Goods or Services similar to those undelivered or under performed and the Supplier/Contractor shall be liable to the CEO, Delhi Cantt Board for any excess costs for such similar Goods. However, the Supplier/Contractor shall continue performance of the Contract to the extent not terminated.

18. Force Majeure: Notwithstanding the provisions, the Supplier/Contractor shall not be liable for forfeiture of its Performance Security, liquidated damages or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

18.2 For purposes of this clause "Force Majeure" means an event beyond the control of the Supplier/Contractor and not involving the Supplier/Contractor's fault of negligence and not foreseeable. Such events may include but are not restricted to, acts of the CEO, Delhi Cantt Board either in its sovereign or contractual capacity, wars on sovereign or contractual capacity wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

18.3 If a Force Majeure situation arises, the Supplier/Contractor shall promptly notify the CEO, Delhi Cantt Board in writing of such condition and the cause thereof. Unless otherwise directed by the CEO, Delhi Cantt Board in writing, the Supplier/Contractor shall continue to perform his obligations under the Contract as far as is reasonably practicable and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

19. Termination for Insolvency:

The CEO, Delhi Cantt Board may at any time terminate the Contract by giving written notice to the Supplier/Contractor, without compensation to the Supplier/Contractor, if the Supplier/Contractor becomes bankrupt or otherwise insolvent (which events shall of themselves be a breach of the contract on the part of the Supplier/Contractor), provided such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the CEO, Delhi Cantt Board .

20. Termination for Convenience:

20.1 The CEO, Delhi Cantt Board may, by written notice sent to the

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Supplier/Contractor, terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the convenience of Delhi Cantt Board, the extent to which performance of work under the contract is terminated and the date upon which such termination becomes effective.

20.2 The goods that are complete and ready for shipment within 20 days after the Supplier/Contractor's receipt of notice of termination shall be purchased by the Delhi Cantt Board at the Contract terms and prices. For remaining Goods the Delhi Cantt Board may elect:

- (a) To have any portion completed and delivered at the Contract terms and prices; and/or
- (b) Cancel the remainder and pay to the Supplier/Contractor an agreed amount for partially completed Goods and for materials and parts previously procured by the Supplier/Contractor.

21. Resolution of Dispute

21.1 The Delhi Cantt Board and the Supplier/Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

21.2 If, after thirty (30) days from the commencement of such informal negotiations, the CEO, Delhi Cantt Board and the Supplier/Contractor have been unable to resolve amicably a Contract dispute either party may require that the dispute be referred to Arbitration, the President, Cantonment Board, Delhi will be the authority to appoint sole arbitrator whose decision shall be final, binding & conclusive.

21.3. Venue of Arbitration shall be at Delhi.

22. Performance Security: The Supplier/Contractor shall be required to submit 03% of the cost of completion of work as performance security (including amount of earnest money deposit) in the form of Bank draft/irrevocable bank Guarantee from Nationalized Bank valid for period of 02 years after date of completion of work (defect liability period). The performance security would be released after expiry of defect liability period. In case of any defects observed in the work done by the Supplier/Contractor the Store-Procurement-incharge will notify the defects to the Supplier/Contractor giving reasonable time as per his discretion from rectification of defects and if Supplier/Contractor fails to rectify the defects within stipulated period the Board shall be at liberty to get the defects rectified from any agency of its choice at the risk and cost of the Supplier/Contractor and expenditure incurred in this regard would be adjusted from the performance security.

23. Third Party Quality control: In order to achieve best workmanship and execution of quality works/ Services to be provisioned under the contract the CEO, Delhi Cantonment Board may engage an independent agency who will carry out independent testing of materials and checking and for ensuring

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over all quality procedures and quality services provisioned under the contract. The Supplier/Contractor shall be required to fully cooperate with agency and facilitate them in taking samples, transportation and examination of various activities including documentation at no extra cost to the Board. In case of any adverse findings by the third party inspecting agency, the Supplier/Contractor shall do the needful rectifications at no extra cost to the Board. The cost towards consultancy /third party quality control to the institutes would be paid by the Board. All works/work order would be subject to third party quality control. The Supplier/Contractor bills will be processed for the payment subject to satisfactory services provisioned under the contract and satisfactory report given by the third party quality control agency and rest of the terms and condition are strictly followed. The Supplier/Contractor shall fully cooperate with agency nominated for third party quality control. This agreement is executed under the provisions of Section 128 of Cantonment Act 2006.

President, Delhi Cantonment Board

Supplier/Contractor
(M/s E3 Waste Solutions)

Member, Delhi Cantonment Board

COUNTERSIGNED

Chief Executive Officer
Delhi Cantonment
(S.V.R. Chandra Sekhar)

9/25/23, 1:07 AM

E3 Waste Solutions Mail - XAPER installation at Delhi Cantonment

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xaper waste solutions <info@e3wastesolutions.com>

XAPER installation at Delhi Cantonment

3 messages

xaper waste solutions <info@e3wastesolutions.com>
 To: ceodelhicannt@gmail.com
 Cc: pardeep <pkdogra2458@gmail.com>

15 February 2022 at 12:14

Respected Sir,

Hope you are doing well.

This is to bring to your kind information that the XAPER 20 TPD waste processing plant was installed on the designated site and conducted a successful test run by feeding fresh waste. We are expecting an early release of payment for the plant.

You are requested to share the draft agreement for operation so we can get it signed and start regular operation for 20TPD waste.

Further we do request you to execute few things before regular operation and inauguration of waste processing plant:

1. Evacuation of the residents of slums living near the site.
2. Paint work in and around building (we can put posters only after paint)
3. Construction of ramp for vehicle carrying waste.
4. Installation of Gate to ensure restricted entry in the area.
5. Road to the entry of plant (Entry gate shall be on slum/jhugi side)

Expecting an early expedition of the same so that you can plan for an early inauguration of the waste processing plant.

Thanks and Regards
 Jasmeet Kaur
 Director
 XAPER Waste Solutions Pvt Ltd

xaper waste solutions <info@e3wastesolutions.com>
 To: ceodelhicannt@gmail.com
 Cc: pardeep <pkdogra2458@gmail.com>

19 February 2022 at 17:00

Respected Sir,

Hope you are doing well.

It gives me great pleasure to inform you that we have carried out trial run of the waste processing plant XAPER with mixed MSW brought by 6 vehicles(tata ace) and got astonishing reduction of more than 90% and are left with only half a vehicle of processed outputs i.e.(Compostable and SCF).

We are taking up the ultimate challenge of zero waste Delhi Cantonment and are confident to achieve the target with our technical expertise and your kind cooperation.We hope that you will give us required hand holding to accomplish the task.

Sir we have over-exhausted our resources in development, validation, installation of plant (execution of contract) now we are under pressure for immediate deposit of GST for Rs.23,61,721/- the tax part of Rs. 2,20,42,726/- bill raised to Delhi Cantonment Board, otherwise we will be heavily panelized for nonpayment of GST. We had not received any advance (30% of project cost) so we request your good self for expedition in release of the payment for the capital cost.

We hope that with your kind cooperation we shall demonstrate that it is possible to get rid of waste and make your vicinity zero waste by diverting 100% waste from landfill sites. By deployment of appropriate technology and with our determination we can demonstrate that disposal of waste is possible in an economically viable and environment friendly manner.

We are not expecting any earnings from the operation of the machine as all labor or disposal costs are transparent(calculated as per actuals) to you and in the next 5 years we will not have any maintenance cost. We are taking up operation and disposal as gesture of goodwill but please take care we shall not be harassed on the basis of penalties 1% or else by your officials as we had very bad experience with the DCB official during operation of pilot in

<https://mail.google.com/mail/u/0/?ik=8013952f41&view=pt&search=all&permthid=thread-a:r6669897969193856912&siml=msg-a:r666494051524883...> 1/2

9/25/23, 1:07 AM

E3 Waste Solutions Mail - XAPER installation at Delhi Cantonment

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 2018-19 even at the time we had not charged a single rupee for capital or operation and were not able to assess the feasibility of XAPER even after a year of operation. There should be some measurable system for quantification of penalties instead of inspection from officials.

At last we do request you to get our capital payment released at the earliest and signing of O&M contract at the earliest so that we can commence the operation.

Thanks and Regards
 Jasmeet Kaur
 Director
 XAPER Waste Solutions Pvt Ltd
 [Quoted text hidden]

xaper waste solutions <info@e3wastesolutions.com>
 To: ceodelhicanth@gmail.com
 Cc: pardeep <pkdogra2458@gmail.com>

22 February 2022 at 20:57

Respected Sir,

Hope you are doing well.

I wish to inform you that I have signed the agreement today(22/2/22) for operation and maintenance of XAPER 20TPD installed in Delhi Cantonment. I request you to plan your visit on the site for your satisfaction.

I further request you to expedite the release of the capital payment for the machine as we are liable to pay the GST by 28th of this month otherwise we will be imposed with a huge penalty. Kindly make the release at the earliest.

Thanks and Regards
 Jasmeet Kaur
 Director
 XAPER Waste Solutions Pvt. Ltd
 [Quoted text hidden]

**SUMMARY OF WASTE PROCESSING DATA BY XAPER at
SADAR BAZAR DELHI CANTONMENT BOARD FOR FIRST
QUARTER (1/07/2022 TO 28/02/2023)**

1	Number of tippers/trolleys employed for carrying input waste to the site	756 tippers(2.2 tons) 10 trolley(0.5 tons)
2.	Total mixed waste INPUT	1668.2 M T
3	OUTPUT (Combustible + Compostable)	372.4 M T
4	Savings to DCB (@Rs4415/ton)	= 1668.2 tons × INR 4415 = INR 73,65,103/-
CALCULATIONS:		
REDUCTION in Waste:		
Input mixed MSW		= 1668.2 tons
Output fractions of waste (Compostable + Combustible)		= 372.4 tons
Reduction in waste quantity		= 1668.2 – 372.4 = 1295.8 tons
% Mass reduction		= 1295.8/1668.2 × 100 = 77.67 %

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**SUMMARY OF WASTE PROCESSING DATA BY XAPER at
SADAR BAZAR DELHI CANTONMENT BOARD FOR FIRST
QUARTER (1/07/2022 TO 30/09/2022)**

1	Number of tippers/trolleys employed for carrying input waste to the site	465 tippers(2.2 tons) 0 trolley(0.5 tons)
2.	Total mixed waste INPUT	888.8 M T
3	OUTPUT (Combustible + Compostable)	222.365 M T
4	Savings to DCB (@Rs4415/ton)	= 888.8 tons × INR 4415 = INR 39,24,052/-
CALCULATIONS:		
REDUCTION in Waste:		
Input mixed MSW = 888.8 tons		
Output fractions of waste (Compostable + Combustible) = 222.365 tons		
Reduction in waste quantity = 888.8 – 222.365 = 666.435 tons		
% Mass reduction = 666.435/888.8 × 100 = 74.98 %		
JULY:-	AUGUST:-	SEPTEMBER:-
Total Day: 31	Total Day: 31	Total Day: 30
Working Day: 26	Working Day: 23	Working Day: 26
Sunday: 5	Sunday: 4	Sunday: 4
Govt Holidays: 0	Govt Holidays: 4	Govt Holidays: 0
Maintenance/Breakdown: 9	Maintenance/Breakdown: 8	Maintenance/Breakdown: 3
Operational Days: 15	Operational Days: 15	Operational Days: 23

**SUMMARY OF WASTE PROCESSING DATA BY XAPER at
SADAR BAZAR DELHI CANTONMENT BOARD FOR SECOND
QUARTER (1/10/2022 TO 31/12/2022)**

1	Number of tippers/trolleys employed for carrying input waste to the site	190 tippers(2.2 tons) 0 trolley(0.5 tons)
2.	Total mixed waste INPUT	418 M T
3	OUTPUT (Combustible + Compostable)	95M T
4	Savings to DCB (@Rs4415/ton)	= 418 tons × INR 4415
		= INR 18,45,470 /-
CALCULATIONS:		
REDUCTION in Waste:		
Input mixed MSW = 418 tons		
Output fractions of waste (Compostable + Combustible) = 95 tons		
Reduction in waste quantity = 418 – 95 = 323tons		
% Mass reduction = $323/418 \times 100 = 77.27\%$		
OCTOBER:-	NOVEMBER:-	DECEMBER:-
Total Day: 31	Total Day: 30	Total Day: 31
Working Day: 26	Working Day: 26	Working Day: 26
Sunday: 5	Sunday: 4	Sunday: 4
Govt Holidays: 4	Govt Holidays: 1 + 3(as per DCB orders)	Govt Holidays: 0
Maintenance/Breakdown: 7	Maintenance/Breakdown: 13 (Due to no lifting of RDF)	Maintenance/Breakdown: NA (Due to no lifting of RDF)
Operational Days: 15	Operational Days: 9	Operational Days:0 (Due to no lifting of RDF)

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**SUMMARY OF WASTE PROCESSING DATA BY XAPER at
SADAR BAZAR DELHI CANTONMENT BOARD FOR SECOND
QUARTER (1/1/2023 TO 28/2/2023)**

1	Number of tippers/trolleys employed for carrying input waste to the site	101 tippers(2.2 tons) 0 trolley(0.5 tons)
2.	Total mixed waste INPUT	222.2 M T
3	OUTPUT (Combustible + Compostable)	55M T
4	Savings to DCB (@Rs4415/ton)	= 222.2 tons × INR 4415
		= INR 9,81,013 /-
CALCULATIONS:		
REDUCTION in Waste:		
Input mixed MSW		= 222.2 tons
Output fractions of waste (Compostable + Combustible)		= 55 tons
Reduction in waste quantity		=222.2 – 55 = 167.2 tons
% Mass reduction		= 167.2/222.2 × 100 = 75.24 %
JANUARY:-		FEBRUARY:-
Total Day: 31		Total Day: 28
Working Day: 26		Working Day: 24
Sunday: 5		Sunday: 4
Govt Holidays: 2		Govt Holidays: 2
Non-operational: 31		Non-operational: 13 (Due to no lifting of RDF)
Operational Days: 0		Operational Days: 11

9/25/23, 1:31 AM

E3 Waste Solutions Mail - 20 TPD XAPER installed at Sadar Bazaar Delhi Cantonment

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xaper waste solutions <info@e3wastesolutions.com>

20 TPD XAPER installed at Sadar Bazaar Delhi Cantonment

1 message

xaper waste solutions <info@e3wastesolutions.com>

6 July 2022 at 14:55

To: ceodelhicannt@gmail.com

Cc: pardeep <pkdogra2458@gmail.com>

Dear Sir,

Hope you are doing well.

At the very outset we wish to thank you for having given us the opportunity to serve Delhi cantonment with our unique "sorting cum composting technology" based XAPER machines. After the initial success of 10 TPD machines installed under EDMC, we were motivated to produce XAPER machines of double the capacity i.e 20 TPD, the very first model of which has been installed in DCB. While the main assembly i.e the bio-digester has perfectly achieved the designed parameters of sorting, composting and reduction in excess of 80% from the Input to output stage, the peripherals in the form of conveyers, which is not our speciality, have given us settling troubles.

As per our commitment we had done various modifications in the conveyors to achieve optimum capacity, aesthetics and continuous operation of the plant. We had to incur a lot of expenditure towards this and engaged conveyor experts to help us.

You will be glad to know that we tested our machine's optimal capacity after the requisite modifications, and have been able to process 11 tippers (22-24 tons) a day continuously for three days. Thereafter, we took a two days break to replace the Compacting system and add an additional conveyor after the trommel stage. The machine has been continuously performing well since then.

Despite our best efforts, the composition of waste itself is a big challenge, since nobody can control incoming waste quality or composition, so we have to deal with unpredictable inputs at the feeding stage, which is the reason for frequent interruptions. You may have observed that all the processes are interlinked through a web of conveyors and any breakdown in a single conveyor or part of the system disrupts the whole operation, which is not uncommon in any waste management plant. As a matter of fact the incidence of interruptions is higher than any other industry which uses conveyers, but enjoys the advantage of uniform quality of inputs.

That was the reason DCB had rightly chosen to go for XAPER machines of smaller capacity not exceeding 20 TPD instead of a single unit of 70 TPD capacity. We strongly feel that as soon as all the machines are installed, we will be able to take care of small interruptions in any machine on a particular day by shifting its load to others, if required, till rectification which we would definitely undertake expeditiously. This is due to the fact that our machines are designed to process additional 20% capacity over short periods of time. This would ensure non accumulation of daily waste at any one machine site.

Till date we have processed more than 200 tons of waste at site. While curing and screening of compost is taking place as desired, we are faced with a highly unexpected challenge as regards the disposal of combustibles to cement plants. IPCA, the agency nominated by the Govt, was regularly lifting the combustibles from our plants in EDMC, but, to our horror and surprise, refused to pick up the combustibles from our DCB plant. As a result, a major portion of combustibles is still lying at site. Col. Dogra has been pressuring us for immediate removal of the same but we don't have any logistics fleet of our own to execute the same and in any case that is not our speciality. In hindsight, we feel we had gone overboard by promising the disposal of combustibles through our EPR partners who had committed for transferring the output to cement plants. Hence, we request you to kindly dispose off the combustibles as per your earlier arrangements, which in any case would not be more than 20% of the input waste. This would ensure cleaner site and help us to remain focused on our specialised task.

Finally, having met our optimal capacity for the processing, we wish to request you to release the balance payment towards the capital cost and formally commission the project to avail the operational cost, which we have been bearing all along so far. It will greatly help us to ameliorate the financial burden which we are constantly facing in terms of payment to the staff employed, besides huge amounts spent on modifications towards achieving optimal efficiency.

I had come to meet you personally on 30th Jun to discuss the above issues, but unfortunately this could not happen due to your prior occupation. I had to fall back to Jalandhar for videography of our manufacturing site, which was required by GeM authorities due to the change in our Company name from "E3 Waste Solutions" to "XaperWaste Solutions Pvt Ltd". I still wish to request a meeting with you, as per your convenience, which may kindly be conveyed to me as soon as possible.

<https://mail.google.com/mail/u/0/?ik=8013952f41&view=pt&search=all&permthid=thread-a:r2873004877768437648&siml=msg-a:r286804742382341...> 1/2

9/25/23, 1:31 AM

E3 Waste Solutions Mail - 20 TPD XAPER installed at Sadar Bazaar Delhi Cantonment

182

Thanks & Regards
Ajay Palta
Managing Director
XAPER Waste Solutions Pvt Ltd

9/25/23, 1:10 AM

E3 Waste Solutions Mail - Xaper installation

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xaper waste solutions <info@e3wastesolutions.com>

Xaper installation

1 message

xaper waste solutions <info@e3wastesolutions.com>
 To: ceodelhicantt@gmail.com
 Cc: pardeep <pkdogra2458@gmail.com>

17 September 2022 at 12:16

To,

The Chief Executive Officer
 Delhi Cantonment Board
 Delhi Cantt - 110010

Subject: Installation of additional 3X20 TPD XAPER machines in Delhi Cantt

Dear Sir,

Hope you are doing fine. I wish to submit the following for your kind consideration and early decision please.

(a) We have fully operationalised the 20 TPD XAPER machine on Tigris road and the same is functioning to its optimal capacity, since first week of July, barring a few days when our company was modifying some of the sub-assemblies or forced stoppages due to the problem of disposal of the segregated combustibles which came up as a rude surprise for us, as discussed with you earlier.

(b) In spite of incurring losses in arranging the disposal of combustibles at a much higher cost than anticipated, we have done our best to abide by the agreement which we had concluded with DCB. We shall continue to do so while concurrently trying to get some help from the Government.

(c) Our final design for 20TPD XAPER machine has been frozen with added improvements such as incorporation of metallic conveyor belts with improved speed and traction. We are of the view that DCB should install additional 3X20 TPD machines at suitable locations to have minimum interference from the residents/public. Overall, cost-wise it would be more economical to install additional 60 MT capacity machines (3X20 TPD) rather than going for 50 MT capacity XAPER machine as planned earlier. This would provide for any increase in the quantum of waste to be processed during the expected lifespan of ten years of the machines.

(d) You would appreciate that no machine, howsoever perfectly designed, can function 24X7 days round the year without expected or unexpected short time stoppages and the problem is more severe with waste management plants. By the installation of a total of 4X20 TPD machines, it would be possible to process the entire waste generated in Delhi Cantt in spite of the occasional stoppages. We would be exercising stringent quality control in the manufacture of all sub-assemblies and would ensure that the MTBF (mean time between failures) is as high as possible and the MTTR (mean time to repair) is not more than a few hours. Towards ensuring this, we would maintain a sufficient inventory of spares of motors and expendables in to be available at short notice Delhi Cantt.

(e) I also wish to inform you that we have had detailed discussions with MCD and expected to finalized terms of operation soon. we are proposing an operation and disposal cost of Rs.1455/- per ton of input quantity of waste. Cost includes manpower, electricity and disposal costs. In future we will move on similar terms DCB.

(f) For the purpose of optimal operation of machines we would build adequate logistic chain and procure additional equipment such as JCBs/truck loaders for the smooth operation of the machines and timely disposal of output.

(g) We propose to offer the same terms and conditions, as agreed with the MCD, for operating the XAPER machines which are yet to be installed by DCB. However, we promise to hold the previously agreed capital cost of Rs 2.3 Cr for the additional machine which are yet to be installed, as a special case for DCB in order to honour our word.

(h) We are constrained from putting our quote for XAPER machines in the GeM portal, due to the pending action on part of DCB to enable us to change our name from 'E3 Waste Solutions Pvt Ltd.' to 'XAPER Waste Solution Pvt. Ltd.'. DCB has yet to confirm the closure of all financial transactions towards the capital cost of 1X20 TPD machine which has already been installed in Delhi Cantt. We earnestly request you to kindly do the needful without any further delay, so that our orders from various other agencies can also flow in based on our quote in the GeM portal under the said new name.

<https://mail.google.com/mail/u/0/?ik=8013952f41&view=pt&search=all&permthid=thread-a:r1149025866031553533&simpl=msg-a:r115067834924823...>

1/2

9/25/23, 1:10 AM

E3 Waste Solutions Mail - Xaper installation

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In case any further discussions/deliberations are required on our above said proposal, you may schedule a meeting for the same at the earliest. Assuring you of our best services.

Yours truly

Ajay Palta
For Xaper Waste Solutions Pvt. Ltd.
(formally e3 waste solutions)

9/25/23, 1:11 AM

E3 Waste Solutions Mail - Regarding relocation of 20 TPD XAPER Unit to Kirby Place Drain and installation of additional units for ...

185



xaper waste solutions <info@e3wastesolutions.com>

Regarding relocation of 20 TPD XAPER Unit to Kirby Place Drain and installation of additional units for managing 70 tons of waste generated in Delhi Cantonment

1 message

xaper waste solutions <info@e3wastesolutions.com>
 To: ceodelhicantt@gmail.com
 Cc: pardeep <pkdogra2458@gmail.com>

6 December 2022 at 13:25

Respected Sir,

Hope you are doing well.

In reference to the show cause notice Under Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 & Under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and (ii) Under Section 5 of the Environment (Protection) Act, 1986 read along with the Solid Waste Management Rules, 2016 issued by DPCC and DM office New Delhi for the resolution of the complaint made by Sadar Bazaar residents regarding the smell from waste, I would like to mention few things which require your urgent attention.

We have been directed to shift the 20 TPD XAPER plant from Sadar Bazaar to Kirby Place Drain before March 2023 and obtain consent for setting up of additional plants on the same site.

We kindly request you to :-

1. Carry out the necessary renovation of the Kirby Place Drain Site so that the additional [plants can be set up and orders from you for setting up the additional plants and getting the existing 20 TPD XAPER plant relocated.
2. Provide us the purchase order for the additional units so that we can install the units within the stipulated deadlines.

Kindly do the needful at the earliest.

Thanks & Regards
 Jasmeet Kaur
 Director
 XAPER WASTE SOLUTIONS Pvt. Ltd



Waste solutions (P.) Ltd

Formely : E 3 Waste Solutions

Ref.

Date :

To
Chief Executive Officer,
Delhi Cantonment Board,
Delhi.

Date: 27/01/2023

Ref: Agreement dated February 2022 for Operation of 20 TPD capacity sorting cum composting machine.

Respected Sir

Hope you are doing well.

This is to bring to you kind notice

- That installation and commissioning of XAPER machine for Decentralized Processing of Solid Waste at Tigris Road Sadar Bazar was complete by January 2022 and the dry trial run started from 7th February onwards.
- That about 119.4 tons of MSW was treated till 30th June 2022 during trial run of machine. DCB had not made any payment for the period but we have to bear all the expenses for labour deployed at site.
- That machine was fully operational from 1st July 2022. In the quarter (July-August- September 2022) 888.8 tons of MSW was processed at site and diverted from landfill.
- That machine proved its capability by attaining 83.8% (average 16.76 tons) of capacity in working days of quarter. 100% of waste processed at site was diverted from landfill.
- That as per terms of agreement a bill for Rs. 9,82,180/- was raised with DCB for operation and disposal of outputs for the quarter in October 2022.
- That after three months of submitting bill we received a payment of just Rs.4,56,135/- and Rs 5,26,045/- (54%) was deducted from the bill. On enquiring about discrepancy in amount it was informed that amount deducted as follow

	Reason for deduction	Amount
1.	Non working of machine for 27 days in period	Rs.1,47,178/-
2.	Cost of Disposal 40 tons of output by DCB @Rs.6092/ton or Rs.30460/- per 5 MT,	Rs.2,42,100/-
3.	GST on deducted amount	Rs. 70,070/-
4.	Reason unknown	Rs. 66,696/-
	TOTAL	Rs.5,26,045/-

✉ Info@e3wastesolutions.com


www.xaper.in
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New Delhi - 110001 India

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144 004 Punjab India



Waste solutions (P.) Ltd

Formely : E 3 Waste Solutions

Ref.

As per the given clarification there still an unexplained deduction of Rs. 66,696/-.

Date :

Sir, we tried our best to prove the potential of machine. Despite incurring huge losses in operation and disposal, we continued our working in gesture of goodwill. The technology installed has proved its worthiness by processing 1446 MT of MSW and DCB saved INR 88,09,032/- (Rs.6092/ton×1446) that DCB recovered about 40% of CAPEX (Rs.2,20,00,000) in just 91 days of operation, savings can be much more if we had required cooperation from DCB.

It is highly unethical and is unjustified to impose such huge penalties on us as these penalty clauses were not mentioned in the agreement. It is persistent to mention that breakdowns in a waste management are inevitable, that was the reason we proposed to install 4 units of XAPER sorting cum composting machines to process 70 tons of waste generated in area. If as per commitment DCB had installed multiple units then break down in one unit may not affect processing as the other units would have counter balance the breakdown and the operation remain seamless so deduction for non working is not acceptable. As per agreement DCB has to pay Rs.7150/- for 5 MT of output disposal. In the month of August DCB disposed off 40 MT of output from the site and we had not added the disposal cost but were astonished to find that an amount of Rs. 2,42,100/- (Rs.30460/- per 5 MT) was deducted from bill as disposal cost, that DCB deducted four times of amount that was never paid to us. Such an unjustified penalty is highly unethical and is not acceptable. So it is requested to reimburse pointless deductions made on us so that some of the losses being incurred by us can be compensated.

It is not possible for us to continue the operations in present circumstances with unnecessary deductions and unexplained delays in payments. We do hereby request you to take up operations with DCB and relive us from the responsibility.

It was our dream to make zero waste Delhi Cantonment by diverting 100% of waste generated in the area. The present agreement with DCB concluded in January 2023, In case DCB keen that we should continue the operations then a fresh agreement should be entered as per terms in the mail dated 17/09/2022 that operational cost /tipping charges of Rs.1455/- per ton of input quantity be paid to company that includes manpower cost, cost of electricity and the disposal cost of output to far-flung cement plants /waste to energy plants/processing facilities as per the directions of MoHUA. It is to be further noted we need a firm confirmation from DCB regarding installation of three more machines as per NGT order so that we can install the same within the stipulated timeline. Detail discussion can be held at convenient time in near future to finalize all terms and conditions for supply of machines and operation of the same.

We once again request your good self to review the undue deduction made from the payment for the period further you are requested to take necessary actions so that we can continue the operations with new resolutions.

Looking forward to hearing from you on the same.

Regards,
For XAPER Waste Solutions Pvt. Ltd.

For Xaper Waste Solutions Pvt. Ltd.

Ajay Palta
Mg. Director. Mg Director

Info@e3wastesolutions.com

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- 📍 HO : Sodal Saipur Road, Industrial Area, Jalandhar 144 004 Punjab India



Waste solutions (P.) Ltd

Formely : E 3 Waste Solutions

Ref.

Date : 28/2/2023

Respected Sir,

Hope you are doing well.

In reference with the previous mail and meeting with Jt. CEO Delhi Cantonment Board on 6/2/2023, we have commenced the operation of site on 13/2/2023.

As it has been conveyed in our previous mail dated 27/01/2023 it is not possible for us to continue operation in present conditions and the previous agreement expired on 24/1/2023 we discussed the matter in meeting with joint CEO. As official was keen to check operation of machine we agreed to operate the machine for the month of February only.

We want to convey that it is not economically as well as technically viable to run single unit so we are requesting it again to relocate the unit and get additional three units installed at Kirby Place as proposed earlier.

Futhuremore, the GeM account for procurement of XAPER is still not closed by the store department of DCB which is not letting other buyers to place orders. Kindly look into the matter urgently.

We want to convey that Waste to Wealth Mission of Office of Principal Scientific Adviser to Govt of India along with Invest India has validated the technology after assessments from experts from premier technical institutes of India so there should not be any hitch in replicating

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the technology in Delhi Cantonment. We are also pleased to share the technology validation certificate (file attached) of XAPER given by O/o Principal Scientific Adviser to Government of India and InvestIndia under Waste to Wealth mission.

Thanks & Regards

Jasmeet Kaur

Director

XAPER Waste Solutions
For Xaper Waste Solutions Pvt. Ltd.
Jasmeet Kaur
Director

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Waste solutions (P.) Ltd

Formely : E 3 Waste Solutions

Ref.

Date : 17/03/2023

Respected Sir,

Hope you are doing well.

In continuation with the previous mails and meetings regarding the operation of XAPER Waste Processing unit installed at Sadar Bazaar, we would like to bring few things to your kind attention:-

We operated the site from 13/02/2023 to 28/02/2023 which is tabulated below:-

Date	No of Vehicles	Quantity of MSW Treated	
13/2/2023	10	22	
14/2/2023	10	22	
15/2/2023	10	22	
16/2/2023	9	19.8	
17/2/2023	9	19.8	
18/2/2023	0	0	Work Halted due to RDF Lifting
20/2/2023	0	0	Work Halted due to RDF Lifting
21/2/2023	4	8.8	
22/2/2023	10	22	
23/2/2023	10	22	
24/2/2023	10	22	
25/2/2023	11	24.2	
27/2/2023	8	17.6	
28/2/2023	0	0	Output stacked on site no more storage space for output.
TOTAL	101	222.2	

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In 11 days working we processed 222.2 tons of waste with average 20.2/day processing that technology proves its working efficiency by processing more than its capacity of 20TPD. If DCB has to transfer 222.2 waste to landfill it would have cost = $222.2 \times 6000 = \text{INR } 13,33,200/-$.

Whereas, DCB is paying us Rs. 1,68,868 per month for working days as labor cost and Rs. 1430 per ton for disposal of output.

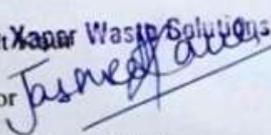
We want to convey that working at these rates is not economically viable and we are bearing huge losses while operating the unit at current rates that is only reason for disruption of operations.

As we had requested you earlier that new agreement may be signed with tipping cost of Rs. 1455/- of input so that we can take up operations at the earliest. While considering above illustration in the case had to pay Rs. 323300/- (222.2×1455) and will save more than ten lacs. We are very keen in working with DCB so you are kindly requested to address and resolve the same.

The issue regarding GeM account for procurement of XAPER is still not closed by the store department of DCB. Kindly look into the matter.

The installed technology is now validated by Office of Principal Scientific Adviser to Govt of India along with Invest India under Waste to Wealth Mission after assessments by experts from premier technical institutes of India and matter is in discussion with highest authorities of India and we want to present Delhi cantonment model to them so we are interested to resume the operation at the earliest.

Thanks & Regards

Jasmeet Kaur
 For Xaper Waste Solutions Pvt. Ltd.
 Director 
 XAPER Waste Solutions **Director**

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waste solutions Pvt.Ltd.

Formely : E3 Waste Solutions

H.O : Sodal Saipur Road, Industrial Area, Jalandhar.144004 Punjab India M. 9872900042, 9041532051

■ info@e3wastesolutions.com ● www.e3wastesolutions.com

To

DATE:-14-04-2023

Chief Executive Officer ,

Delhi Cantonment Board,

Delhi

SUB: Reply to SHOW Cause notice Dated 6th April,2023

Ref: Memo no DCB/IT/Misc.

1. That plant was closed on 27/02/2023 and DCB has been intimated via letter dated 28/02/2023.
2. That plant was not functional on days either due to maintenance or mainly due to accumulation of RDF on the site.
3. That reasons for non functioning of plant was mentioned in our previous reply dated 7th January 2023,27th January 2023 and 28th February 2023 as well as been discussed with officials of DCB on various occasions.
4. That reply to Show cause dated 07/2/2023 was given on the same day by meeting Jt. CEO and addressing the problems on site.
5. That we are well aware of the importance of plant but plant was non functional as circumstances are beyond our control and requested board officials time and again for re-negotiation on terms for disposal.
6. That
 - i. Expected life of machine is 10 years and are responsible for its maintenance as per terms of supply. Machine is operational and working is in working condition
 - ii. DCB has to pay appropriate operational and disposal costs and the only reason for non functioning is inappropriate operational and disposal cost.
 - iii. As it has been mentioned in our earlier communications that we are incurring heavy losses in operation and disposal in the situation it is discretionary deductions by DCB are unbearable. DCB deducted Rs. 2,42,100/-for disposal of 40 MT of SCF of which Rs. 124100 is transportation cost to okhla and Rs.1,18,000/-(Rs.2950 x 40)as cost of waste processing.

xaper ¹⁹³ waste solutions Pvt.Ltd.

Formely : E3 Waste Solutions

H.O : Sodal Saipur Road, Industrial Area, Jalandhar.144004 Punjab India M. 9872900042, 9041532051

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While we were taken at par with existing transportation contractor and Rs.7150/- fixed as transportation cost in the agreement that we are responsible for transportation only at par with existing transporter. Whereas justified deduction was Rs.124100(transportation cost to DCB) minus Rs. 57200/- (disposal cost settled with us) = Rs. 66900/- only while DCB deducted Rs. 2,42,000/- which is highly un justified.

7. That

- A) We requested for termination of existing contract in our earlier communications .Either DCB can take up operation itself or make fresh contract with justified costs.
- B) Performance security is linked with capital goods only that it is linked with performance of machinery/technology only .We are responsible for its maintenance or replacement .Please let us know if there is any fault in the machinery or any other technical problems.
- C) Machine is functional but is not operation .DCB shall decide how to get operational with legitimate operational and disposal costs.
- D) It is highly unjustified to black list our company on basis of non operation as
 - i. Technology has proven it worth and machinery has been tested for its capacity by Board officials.
 - ii. Technology has been validated by office of Principal Scientific Advisor, Waste to Wealth mission, Invest India and even DCB itself in its reply to NGT has approved the satisfactory performance of technology.
 - iii. It is not fair to inform other offices of non-operation of machine while it is just matter of operational and disposal cost that can be settled by mutual consent

Thanks & Regards

Ajay Palta

For Xaper Waste Solutions Pvt. Ltd.

Mg. Director

Managing Director

XAPER Waste Solutions Pvt. Ltd

9/25/23, 1:13 AM

E3 Waste Solutions Mail - Regarding resuming the operation of XAPER 20 TPD Waste Processing plant installed in Sadar Bazar ...

194



xaper waste solutions <info@e3wastesolutions.com>

Regarding resuming the operation of XAPER 20 TPD Waste Processing plant installed in Sadar Bazar Delhi Cantonment

1 message

xaper waste solutions <info@e3wastesolutions.com>
 To: ceodelhicantt@gmail.com
 Cc: pardeep <pkdogra2458@gmail.com>

7 August 2023 at 08:00

Respected Sir,

Hope you are doing well.

As mentioned in our earlier mails and letters dated 24/04/2023 and 18/03/2023, we are eager to operate the waste processing system installed at Sadar Bazaar as the technology has proved its worth by processing and diverting 1668.2 tons of municipal solid waste from Okhla landfill site. In our recent telephonic conversations with Mr. Gyanendra and Rtd. Col P K Dogra, we have been informed that DCB is interested in resuming the operation of the XAPER 20TPD machine installed at Sadar Bazaar.

In the same regard, we want to convey that it is not possible for us to continue the operations on the basis of the previous agreement instead we can go for a tipping fees model as we are finalizing with MCD. We do request you to pay tipping fees of INR 1455 per ton of incoming MSW tipped at the processing site. Our company shall be responsible for processing and disposal of products generated from processing.

Secondly we have approached DPCC for the consent of the site as per instructions of NGT but they insisted on relocating the unit at the earliest only then they will give consent for operation. We do request you to specify the space for unit relocation so we can abide by NGT instructions.

We are willing to co-operate with DCB in every possible way to make ZERO WASTE Delhi Cantonment. As per your directions we will take up the operation as per renewed agreement or we will train DCB personnels to ensure smooth operation of the processing plant.

Kindly suggest a suitable date and time for a meeting for the same.
 Looking forward to a positive resolution.

Thanks & Regards
 Jasmeet Kaur
 Director
 XAPER Waste Solutions Pvt Ltd

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By Speed Post/Email



DELHI POLLUTION CONTROL COMMITTEE
DEPARTMENT OF ENVIRONMENT, GOVT. OF NCT OF DELHI
5th FLOOR, ISBT BUILDING, KASHMERE GATE, DELHI-110006
 visit us at : <http://dpcc.delhigovt.nic.in>

F. No. DPCC / WMC-II / OA No. 694 of 2022 / 2022 / 957-960 Dated: 30.11.2022

Subject: Show Cause Notice (i) Under Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 & Under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and (ii) Under Section 5 of the Environment (Protection) Act, 1986 read along with the Solid Waste Management Rules, 2016.

Whereas, Central Pollution Control Board is the State Board for all the Union Territories to exercise powers and perform functions under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.

And whereas, Central Pollution Control Board has delegated all its powers and functions under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 in respect of Union Territory of Delhi to Delhi Pollution Control Committee (DPCC) vide Notification No. S.O.198 (E) dated 15.03.1991.

And whereas, it is a mandatory provision under u/s 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 that no person without the previous consent of the DPCC shall Establish or take any steps to establish any industry, operation or process or any treatment and disposal system an extension or addition thereto, which is likely to discharge sewage or trade effluent into a stream or well or sewer or on land.

And whereas, the whole Union Territory of Delhi has been declared as an Air Pollution Control area, under sub section (I) of section 19 of the Air (Prevention and Control of Pollution) Act, 1981 vide notification no. GSR 106 (E) dated 20.02.1987.

And whereas, it is mandatory provision u/s 21 of the Air (Prevention and Control of Pollution) Act, 1981, that no person without the previous consent of the Delhi Pollution Control Committee i.e. State Board in case of Delhi, shall Establish or operate any industrial plant in air pollution control area.

And whereas, Ministry of Environment, Forest and Climate Change, Govt. of India has notified the Solid Waste Management Rules, 2016, vide Gazette Notification dated 08.04.2016.

And whereas, as per the provisions of Rule 15 of the Solid Waste Management Rules, 2016 (Duties and responsibilities of local authorities and village Panchayats of census towns and urban agglomerations). The local authorities and Panchayats shall :-

“Rule 15 (y) make an Application in Form I for grant of Authorisation for setting up waste processing, treatment or disposal facility, if the volume of waste is exceeding five metric tones per day including sanitary landfills from the State Pollution Control Board or the Pollution Control Committee, as the case may be”

And whereas, as per the provisions of Rule 19 (3) of the Solid Waste Management Rules, 2016 (Criteria for Duties regarding setting-up solid waste processing and treatment facility) :

“The operator of the facility shall obtain necessary approvals from the State Pollution Control Board or Pollution Control Committee”.

And whereas, DPCC vide letter dated 16.08.2021 had informed the Local Authorities / Municipal Corporations in Delhi including Delhi Cantonment Board referring the above mentioned provisions under the Air & Water Acts and Solid Waste Management Rules, 2016 regarding

Contd... 2

requirement of Consent to Establish, Consent to Operate under the Air & Water Acts and Authorization under the Solid Waste Management Rules, 2016.

And whereas, as per the provisions of the Solid Waste Management Rules, 2016, Delhi Cantonment Board (DCB) is responsible for arranging for door to door collection of segregated solid waste from all households including slums and informal settlements, commercial, institutional and other non-residential premises and transportation to appropriate sites for processing and disposal either through own resources or by appointing private operators.

And whereas, as per the provisions of Solid Waste Management Rules, 2016 "Delhi Cantonment Board" is responsible for the implementation of the provisions of these Rules and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes.

And whereas Hon'ble National Green Tribunal vide order dated 31.10.2022 in O.A. No. 694 of 2022 in the matter of "Bhupinder Singh Vs. Govt. of NCT of Delhi has constituted a Joint Committee comprising of DPCC and concerned District Magistrate to verify the factual position regarding the complaint of Mr. Bhupinder Singh with respect to waste treatment facility set up in front of the Gurudwara and Temple, emitting foul smell and causing air pollution posing serious health hazards to residents of the locality particularly children who are falling ill and having breathing problem.

And whereas in compliance to the abovementioned order of Hon'ble National Green Tribunal, a meeting of the Joint Committee comprising of DPCC and District Magistrate (New Delhi) was held on 11.11.2022 and the Joint Committee also visited the site of Waste Processing Facility at Sadar Bazar, Opposite to Gurudwara and Temple, Delhi Cantonment, New Delhi on 11.11.2022.

And whereas, the Chief Executive Officer, Delhi Cantonment Board, Delhi Cantt, Sadar Bazaar, Delhi-110010 is responsible for the compliance of the above mentioned provisions of the Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and Section 25/ 26 of the Water (Prevention and Control of Pollution) Act, 1974, as amended to date and also provisions of the Solid Waste Management Rules, 2016 in the areas under the jurisdiction of the Delhi Cantonment Board including Waste Processing Facility of 20 TPD Capacity at Sadar Bazar, Opposite to Gurudwara and Temple, Delhi Cantonment, New Delhi -110010

And whereas, the Director, XAPER Waste Solutions Private Limited, Sodal-Saipur Road, Jalandhar, Punjab – 144004 is responsible for the Establishment and Operation of the Waste Processing Facility of 20 TPD Capacity at Sadar Bazar, Opposite to Gurudwara and Temple, Delhi Cantonment, New Delhi -110010.

And whereas Report of the Joint Committee comprising of DPCC & District Magistrate (New Delhi) including visit on 11.11.2022 of M/s XAPER Waste Solutions Pvt. Ltd. (Waste Processing Facility) at Sadar Bazar, Opposite to Gurudwara and Temple, Delhi Cantonment, New Delhi -110010 has been sent to the Chief Executive Officer, Delhi Cantonment Board and Director of Project Proponent (M/s XAPER Waste Solutions Private Limited, Sodal-Saipur Road, Jalandhar, Punjab – 144004) vide letter dated 25.11.2022.

And whereas following are the brief of observations and information gathered by the Joint Committee from the Project Proponent / DCB officials during the visit on 11.11.2022 and mentioned in the said Report of the Joint Committee :

- (i) The Waste Processing Facility is having Sorting cum Composting Machine of 20 TPD capacity and other related Machinery installed in covered shed of size about 40 meter x 16.5 meter x 7.6 meter. Shed area is about 660 square meter. One Supervisor, 3 Skilled workers & 7 Semi / unskilled workers have been reportedly deployed for the operation of the facility. The facility is located about 50 meter from the Gurudwara which is opposite to the facility across the road.

Contd... 3

- (ii) The Waste Processing Facility is being operated and maintained by M/s XAPER Waste Solutions Pvt. Ltd. During the visit the facility was not in operation. It was informed that the facility was not operated on the request of Gurudwara people due to Gurupurab since 06.11.2022.
- (iii) One Anti Smog Gun (ASG) found installed near the Conveyer Belt outside of the Shed used for receiving fresh Municipal Solid Waste. ASG was found operating during the visit and spraying towards road side.
- (iv) List of main Plant & Machinery installed at the facility was provided by the Project Proponent and briefed below :
- Slow-Moving Feeding Conveyor (1 No.), Pre-Sorting Trommel (1 No., Sieve Size 120 mm), Feeding Conveyor (5 No.), Forced Feeder (1 No. Sieve Size 80 mm), Accelerated Aerobic Decomposer (AAD) Bioreactor (1 No.), Combustible Conveyor (2 No.), Hydraulic Compactor (2 No.), Compostable Conveyor (3 No.), Compost Sieving System (1 No., Sieve Size 4 mm), Recyclable Storage Bin (3 No.), Receptacles (5 No.) and Control Panel (1 No.).
- (v) It was informed by the representative of the Project Proponent present during the visit that the facility is in operation since July, 2022. Summary of performance data of XAPER machine installed at the facility since 1st July, 2022 was provided by the Project Proponent. As per the said data, Total 1314 Metric Tons of mixed waste was received at the facility since 01.07.2022 and 285.28 Metric Tons of (Combustible & Compostable) material was produced. Reduction in waste quantity was 1028.72 Metric Tons (78.28 %). Project Proponent claims that there is no Methane emission and Leachate generation from the said facility. It was informed that Compost generated from the Plant is used in Horticulture and Green Belt of the Delhi Cantonment Board area. Combustible fraction generated from the facility is disposed through IPCA etc. for use in cement factories
- (vi) Combustible material & Compost found stored within the facility. It was informed that Combustible material (About 10 Metric Tons) & Compost (About 5 Metric Tons) stored in the facility was produced after processing the mixed municipal solid waste in the said facility.
- (vii) The Joint Committee observed that though the Waste Processing Facility was not in operation however, smell /odour observed inside the facility during the visit. Some nearby residents present during the visit at the site also informed that when the plant operates they face smell/odour problem and the problem aggravates during night.
- (viii) The Joint Committee also visited the new proposed site at Kirby Place near Drain / Unauthorized Settlements identified by DCB for shifting the abovementioned existing Waste Processing Facility at Sadar Bazar and installation of three new proposed Xaper Machines. It was informed that DCB will provide separate approach road for entry at the proposed site. The location of the proposed site seems to be appropriate for said facilities.

And whereas, neither Delhi Cantonment Board nor Project Proponent (M/s Xaper Waste Solutions Pvt. Ltd) has applied for Consent to Establish and Consent to Operate under the Air & Water Acts and Authorisation under the Solid Waste Management Rules, 2016 to DPCC in respect of above mentioned Waste Processing Facility of 20 TPD Capacity at Sadar Bazar, Opposite to Gurudwara and Temple, Delhi Cantonment, New Delhi -110010.

And whereas as per the said report of the Joint Committee, the Joint Committee is of the view that there is problem of smell /odour from the said facility and therefore recommends shifting of the said facility from the present location at Sadar Bazar in Delhi Cantonment to some other location/site already identified by Delhi Cantonment Board at Kirby Place near Drain. Delhi Cantonment Board to shift the said facility at the earliest at the most within 4 months period. Till the said Waste Processing Facility is shifted, the Project Proponent should take necessary precaution and measures for controlling / minimising smell / odour (by spraying deodorizers/other control measures) from the said facility.

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Now therefore, in view of the above, the Chief Executive Officer, Delhi Cantonment Board, Delhi Cantt, Sadar Bazaar, Delhi-110010 and Director, XAPER Waste Solutions Private Limited, Sodal-Saipur Road, Jalandhar, Punjab-144004 are hereby called upon to Show Cause as to why necessary action under the Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981 and under Section 5 of the Environment (Protection) Act, 1986 read along with the Solid Waste Management Rules, 2016 should not be taken against Delhi Cantonment Board and XAPER Waste Solutions Private Limited for Establishing and Operating the Waste Processing Facility of 20 TPD Capacity at Sadar Bazar, Opposite to Gurudwara and Temple, Delhi Cantonment, New Delhi -110010 in violation of the provisions of the Water Act, Air Act and Environment (Protection) Act read along with the Solid Waste Management Rules, 2016.

Chief Executive Officer, Delhi Cantonment Board and Director, XAPER Waste Solutions Private Limited are directed ;

- (i) To shift Waste Processing Facility of 20 TPD Capacity at Sadar Bazar, Opposite to Gurudwara and Temple, Delhi Cantonment, New Delhi -110010 from its present location at Sadar Bazar in Delhi Cantonment to some other location / site already identified by Delhi Cantonment Board at Kirby Place within four months period i.e. by 31st March, 2023.
- (ii) Till the abovementioned Waste Processing Facility is shifted to the new location, the Project Proponent (XAPER Waste Solutions Private Limited) shall take necessary precaution and measures for controlling / minimising smell / odour (by spraying deodorizers / other control measures) from the said facility.
- (iii) Delhi Cantonment Board / XAPER Waste Solutions Private Limited shall obtain prior Consent to Establish under the Air & Water Acts before Shifting and Establishing the abovementioned facility at the new location and also obtain Consent to Operate under the Air & Water Acts and Authorisation under the Solid Waste Management Rules, 2016 from DPCC before starting the operation at new location.

Your reply, if any, along with supporting documents should reach this office within 15 days from the date of receipt of this Notice, failing which necessary action shall be initiated under the Water Act,1974, Air Act,1981 and Environment (Protection) Act,1986, without any further reference in this regard.

This may also be treated as an opportunity of hearing under the said Acts.


(Dr. K.S Jayachandran)
Member Secretary, DPCC

To,

1. **The Chief Executive Officer,**
Delhi Cantonment Board, Delhi Cantt, Sadar Bazaar, Delhi-110010.
2. **The Director,**
XAPER Waste Solutions Private Limited, Sodal-Saipur Road, Jalandhar, Punjab - 144004.

Copy for information to:

1. The District Magistrate (New Delhi), Office of the District Magistrate, 12/1, Jam Nagar House, Shahjahan Road, New Delhi- 110011.
2. PS to Chairman, DPCC.


(Dr. K.S Jayachandran)
Member Secretary, DPCC



दिल्ली छावनी परिषद
DELHI CANTONMENT BOARD
 सदर बाजार, दिल्ली छावनी- 110010
 Sadar Bazar, Delhi Cantt - 110010
 हर काम देश के नाम



Tel. No.: 011-25693837, 25695450 ✉: ceodelh-stats@nic.in 🌐: www.delhi.cantt.gov.in

No. DCB/IT/ScM/2022

Dated: 7 Dec, 2022

To,

M/s XAPER Waste Solutions Pvt. Ltd.
 (Formerly E3 Waste Solutions)
 1, Palta Market, Sodal Saipur Road,
 Jalandhar, Punjab - 144004

SUBJECT: Regarding Show Cause Notice (i) Under Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 & Under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and (ii) Under Section 5 of the Environment (Protection) Act, 1986 read along with the Solid Waste Management Rules, 2016 issued by DPCC

Sir,

Reference DPCC Show Cause Notice No. DPCC/WMC-II/OA No. 694 of 2022/2022/957-960 dated 30.11.2022 on the cited subject, copy also endorsed to you.

2. It has been come to our notice only during the visit of committee constituted by Hon'ble NGT, that your company had not taken prior consent of DPCC/CPCB for the installation and operation of the 20 TPD XAPER machine at Tigris road, Delhi Cantt.
3. In view of the timeline given by DPCC in the show cause notice, you are requested to take immediate necessary action, under intimation to this office, for the following:
 - a) Obtain consent of DPCC for the operation of the existing 20 TPD XAPER machine incorporating the 'Sorting cum Composting technology', installed at Tigris road.
 - b) Prior consent for shifting of the existing machine to a new location and setting up of any additional 20 TPD XAPER machines in Delhi Cantonment.
4. Please accord top most priority being Hon'ble NGT matter.

Yours faithfully,

Chief Executive Officer
 Delhi Cantonment
(SVR Chandra Sekhar)



दिल्ली 2001 परिषद
DELHI CANTONMENT BOARD

सदर बाजार, दिल्ली छावनी- 110010
Sadar Bazar, Delhi Cantt - 110010
हर काम देश के नाम



Tel. No.: 011-25693837, 25695450 ✉: ceodelh-stats@nic.in 🌐: www.delhi.cantt.gov.in

No. DCB/IT/ScM/2022

Dated: 3 March, 2023

To,

M/s XAPER Waste Solutions Pvt. Ltd.
(Formerly E3 Waste Solutions)
1, Palta Market, Sodal Saipur Road,
Jalandhar, Punjab - 144004

SUBJECT: Regarding Show Cause Notice (i) Under Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 & Under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and (ii) Under Section 5 of the Environment (Protection) Act, 1986 read along with the Solid Waste Management Rules, 2016 issued by DPCC

Sir,

Reference this office letter of even number dated 07.12.2022 on the cited subject.

2. Vide above referred letter dated 07.12.2022, you were directed to seek and take necessary consent of DPCC for the operation of the existing 20 TPD XAPER machine incorporating the 'Sorting cum Composting technology', installed at Tigris road. Your response in this regard is still awaited.
3. Please accord top most priority.

Yours faithfully,

(Gyanendra Pal Singh)
OIC Sanitation
Delhi Cantonment Board



दिल्ली छावनी परिषद
DELHI CANTONMENT BOARD

सदर बाजार, दिल्ली छावनी- 110010

Sadar Bazar, Delhi Cantt - 110010

हर काम देश के नाम



Tel. No.: 011-25693837, 25695450 ✉: ceodelh-stats@nic.in 🌐: www.delhi.cantt.gov.in

No. DCB/IT/Misc/2022

Dated: 14 September, 2023

To,

M/s XAPER Waste Solutions Pvt. Ltd.
(Formerly E3 Waste Solutions)
1, Palta Market, Sodal Saipur Road,
Jalandhar, Punjab - 144004

SUBJECT: CONTRACT FOR PROCUREMENT OF XAPER MACHINE FOR DECENTRALIZED PROCESSING OF FRESH SOLID WASTE TO ACIEVE ZERO WASTE SCENARIO IN DELHI CANTONMENT

BLACKLISTING OF YOUR COMPANY FROM DELHI CANTONMENT BOARD AND DEBARRING YOU FROM PARTICIPATION IN ANY FUTURE TENDERS OF DELHI CANTONMENT BOARD

Reference:

- i. GeM Contract No. GEMC-511687791035946 dated 29.11.2021.
- ii. Agreement dated 24.01.2022
- iii. Final Show Cause Notice No. DCB/IT/Misc/2022 dated 06.04.2023.
- iv. Notice of Hearing dated 18.04.2023 & 24.04.2023

2. Please find enclosed herewith copy of proceeding/report No. DCB/IT/Misc/2022 dated 07.08.2023 passed by Joint Chief Executive Officer, Delhi Cantonment Board. Copy enclosed as **Annexure-A**.

3. It is intimated that Board examined in detail the above said proceeding/report of Joint Chief Executive Officer, Delhi Cantonment Board and thus, Board vide CBR No. 10 dated 09.08.2023 resolved to terminate the contract dated 24.01.2022. The Board further also resolved to blacklist & debar your firm from participation in any tender of Delhi Cantonment Board. Copy of CBR No. 10 dated 09.08.2023 is enclosed as **Annexure-B**.

4. That, the contract dated 24.01.2023 is terminated, due to the breach of conditions and failure to perform the contract of operation and maintenance of Solid Waste Processing cum Compositing Machine by you in accordance with the terms and conditions envisaged in the said Agreement. Consequently, your Bank Performance Guarantee No. 0825IGPER000122 dated 03.03.2022 amounting to Rs. 6,61,300/- is forfeited.

5. Further, a penalty of Rs. 1,45,98,370/- as per the clause 15 & 16 of the agreement dated 24.01.2022, is imposed on you by this office on account of negligence and non-functioning of machine. The details of penalty are given here under:

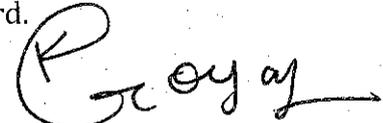
a. The department has incurred a loss of Rs. 72,99,185/- from July, 2022 to June, 2023 due to non-operation of the plant.

b. As per Clause 15 of the agreement dated 24.01.2023, if the machine is not functional or optimally functional, then amount will be proportionately deducted and in case of repeated failures, penalty upto 2 times of the proportionate amount may be imposed. The relevant text of the above said Clause is reproduced below:

"In case of the repeated failure of the machine, CEO, DCB may in his discretion impose penalty upto 2 times this proportionate amount and if deemed necessary terminate the contract in part or full at the risk and cost of the supplier/ contractor and recover the amount from any monies due the supplier/ contractor."

c. Hence, penalty of Rs. 1,45,98,370/- (2 x 72,99,185) is imposed on the firm. However, the department will recover an amount of Rs. 6,61,300/- from the Performance Bank Guarantee.

6. In view thereof, you are directed to deposit the remaining penal amount of Rs. 1,39,37,070 within 30 days from the receipt of this letter failing which appropriate legal action will be initiated. This is without prejudice to any other right or remedy which shall have accrue or shall accrue hereafter to the Delhi Cantonment Board.



(Kapil Goyal)

Chief Executive Officer
Delhi Cantonment Board

**PROCEEDINGS BEFORE THE Jt. CHIEF EXECUTIVE OFFICER
Delhi Cantonment Board,
Sadar Bazar, Delhi Cantt. 110010**

No. DCB/IT/Misc./2022

Dated 07.08.2023

SUBJECT: CONTRACT FOR OPERATION AND MAINTENANCE OF WASTE PROCESSING CUM COMPOSTING MACHINE BY M/s XAPER WASTE SOLUTIONS Pvt. Ltd.

Cantonment Board Delhi vide CBR No. 11 dated 29.11.2021 had approved the contract for procurement and operation & maintenance of 20 TPD Sorting-cum-Composting machine by M/s Xaper Waste Solutions Pvt Ltd. for processing of Municipal Solid Waste generated within the jurisdiction of Delhi Cantonment Board. After the commencement of the contract, the office reported various lapses on the part of the said Firm and various circumstances and events leading to the present proceedings are as under:

1. A notice dated 06.04.2023 was issued to M/s Xaper Waste Solutions Pvt. Ltd. (hereinafter referred to as 'the firm') for reported lapses wherein the firm was directed to present its case through authorized representative on 18.04.2023 at 04:00 P.M. However, no one was present on behalf of the firm on the said date of hearing. Thereafter, again a final opportunity was provided to the firm to present its case on 24.04.2023 at 03:30 P.M. in the office of Delhi Cantonment Board. However, again no one was present on behalf of the firm on 24.04.2023 at 3.30 PM.
2. Sh. Gyanendra Pal Singh, OIC Sanitation submitted that no one will attend today's meeting on behalf of the firm and further informed that the firm had requested via email dated 24.04.2023 to consider their response dated 14.04.2023 to show cause notice dated 06.04.2023. The submissions made by Sh. Gyanendra Pal Singh, OIC Sanitation are as under:
 - i. The work for the processing of the Municipal Waste in sorting cum composting machine commenced from 01.07.2022 as per the agreement dated 24.01.2022. The period of contract was 10 years from the date of operation of machine i.e. 01.07.2022 subject to the satisfactory performance of the firm which will be reviewed by the Department on yearly basis. From the inception, the firm was negligent in carrying out its duties and further, the machine was not operating on its maximum capacity. In the first quarter starting from 01.07.2022 to 30.09.2022, the machine was intentionally made not functional for 25 days without any prior permission or intimation to the Department. This led to very inconvenient situation for the Board as the Board had to divert the waste to Okhla landfill site after making necessary payment to the concerned authority and also bearing the cost of transportation.
 - ii. Subsequently on numerous occasions, the firm was advised to adhere to the conditions of the agreement dated 24.01.2022 and not to stop the operation of plant without prior notice/ permission to avoid any health hazard in Delhi



Cantt due to piling of unprocessed waste. However, the firm continued with its negligent attitude and again stopped processing the waste in the plant from 25.11.2022, without any prior permission or intimation to the Department. It was also seen that substantial quantity of waste was also lying near the plant as it was not lifted by the firm in violation of the terms and conditions of the agreement dated 24.01.2022.

- iii. Taking note of these repeated failures, a show cause notice dated 06.01.2023 was issued to the firm as to why penalty should not be imposed on the firm. The firm was further directed to make the plant functional and to lift the waste lying near the plant with due intimation to the office. However, the firm failed to comply with the directions of the Department.
 - iv. The firm vide its reply dated 07.01.2023 gave an evasive response trying to cover up the lapses of the firm in the operation and maintenance of sorting cum composting machine. In its reply, the firm admitted to stopping the plant on the pretext of non-payment of bills of the firm for the operation of the plant. Thereafter, the firm vide its reply dated 27.01.2023 raised queries regarding the deduction made in their bill. Further, the firm unilaterally declared that it will not operate as per the agreement dated 24.01.2022 and declared to enter into a fresh contract as per their own terms and conditions. The firm failed to adhere to the directions given by the office from time to time and did not made the plant operational which caused administrative difficulties and the department incurred expenditure in transporting and processing of the municipal waste to Okhla landfill site.
 - v. Therefore, the office again issued Show-Cause Notice dated 07.02.2023 to the firm for not making the plant functional despite clear directions. In this notice, the Department considered the replies submitted by the firm on 07.01.2023 and 27.01.2023. The deductions made by the Department from the bill of the firm was explained in detail. The firm was issued a final warning to make the plant functional with immediate effect. The firm started operating the plant from 13.02.2023 and abruptly ended the operation of the plant from 27.02.2023. The plant is not in operation since then.
 - vi. The office took note of the irresponsible conduct of the Firm in closing the plant w.e.f. 28.02.2023 without any notice or intimation for which Show-Cause Notice dated 06.04.2023 was issued to the firm leading to this proceeding. Further, the firm also failed to obtain consent from DPCC for operating this plant under different statutory provisions. In this regard, the firm was inter-alia directed by the office vide letter No. DCB/IT/ScM/2022 dated 07.12.2022 to obtain the consent of DPCC for the operation of the plant. However, the firm neither complied nor explained the lapse.
3. The major points raised by the firm in its reply to the show cause notices issued by the office are summarized below:



- i. The operation of the site has been stopped due to non-payment of operation costs for two consecutive quarters.
- ii. The rates are not economically viable and bearing huge losses while operating the unit at current rates.
- iii. The department has to pay appropriate operational and disposal cost and the only reason for non-functioning is inappropriate operational and disposal cost.
- iv. The deductions made by the office is causing heavy losses in operation and disposal. The relevant para is reproduced below:

".....DCB deducted Rs. 2,42,100/- for disposal of 40 MT of SCF of which Rs. 124100 is transportation cost to Okhla and Rs. 1,18,000/- (Rs. 2950 x 40) as cost of waste processing. While we were taken at par with existing transportation contractor and Rs. 7150/- fixed as transportation cost in the agreement that we are responsible for transportation only at par with existing transporter. Whereas justified deduction was Rs. 124100 (transportation cost to DCB) minus Rs. 57200/- (disposal cost settled with us) = Rs. 66900/- only while DCB deducted Rs. 2,42,000/- which is highly un justified."

- v. The Department should either take up operation itself or make fresh contract with justified costs.
- vi. Performance security is linked with capital goods only that it is linked with performance of machinery/ technology only. The firm is responsible for its maintenance or replacement and there is no fault in the machinery or any other technical problems.
- vii. Machine is functional but is not operational. The office should decide how to get operational with legitimate operational and disposal costs.

On detailed examination of the matter, the following emerges:

4. The clause 2 of the agreement is reproduced below:

"Clause 2 Operating Cost:The operating cost would be escalated @ 7% per annum, till the expected life of 10 years of the machine, should the services of the Supplier/Contractor be taken beyond one year."

The phrase "*.....should the services of the Supplier/Contractor be taken beyond one year.*" used in the above quoted para clarifies that the firm is bound by the agreement dated 24.01.2022 to provide its service in processing and disposing of municipal waste till 10 years from the date of operation of machine i.e. 01.07.2022 subject to the satisfactory performance of the firm which will be reviewed by the department on

yearly basis. Therefore, it is held that there can be no unilateral claim by the firm to end or shorten the period of contract.

"Clause 6: The Supplier/Contractor shall be responsible for smooth and continuous operation of the machine and shall ensure all security and safety arrangements of equipment are put in place on site....."

The phrase *"The Supplier/Contractor shall be responsible for smooth and continuous operation of the machine....."* used in the above quoted clause proves beyond doubt that the supplier was bound to ensure smooth and continuous operation of the machines at the entire period of the contract. It is needless to mention that the smooth functioning of the plant is one of the essential condition of the agreement which cannot be violated. Further, the operation and maintenance of the plant comes under the category of 'Essential Services' which cannot be stopped at any point of time as it would directly affect the health and hygiene of the citizen. The language of the contract dated 24.01.2022 is absolutely clear to the effect that the project is of utmost importance to the residents of Cantt area and therefore there should be no negligence or deficiency in performance of the services as it will adversely affect the health and hygiene of the citizens.

The details of the period when the plant was not operational are mentioned below:

S. No.	Month	No. of Days when plant was not operational
1.	July, 2022	09
2.	August, 2022	14
3.	September, 2022	02
4.	October, 2022	09
5.	November, 2022	30
6.	December, 2022	31
7.	January, 2023	31
8.	February, 2023	14

The plant is not operational from 27.02.2023. These days on which the plant was not operational has not been disputed by the firm. Infact, the firm has admitted in its reply dated 07.01.2023 and 27.01.2023 that the plant was stopped due to non-payment of its bill on time. It is seen from the records that despite making payment the firm refused to make the plant operational. The details regarding payment made to the firm is mentioned in the below table:

S. No.	Date	Amount of payment	Period
1	19.01.2023	Rs. 4,65,444/-	1 st Quarter (July to Sept, 2022)
2	14.02.2023	Rs. 3,62,823/-	2 nd Quarter (October to December, 2022)

As can be seen, delay in the payment of bills cannot be a ground for stoppage of essential services. It is reiterated that the operation and maintenance of the plant

comes under the category of 'Essential Services' which cannot be stopped at any point of time as it would directly affect the health and hygiene of the citizen.

In view of the above, it is held that the firm was bound to ensure smooth functioning of the plant in the entire contract period. This was no doubt the essential condition of the contract and was of paramount importance to the organisation. Therefore, the act of the firm in making the plant non-functional amounts to breach of the essential terms and conditions of the agreement dated 24.01.2022.

5. Clause 2 and 7 of the agreement dated 24.01.2022 which is reproduced below:

2. Operating Cost: *This will be borne by DCB, as tabulated below. The Supplier/Contractor will be required to pay the workmen as per minimum wages act, including the enhancement of wages from time to time. The Supplier/Contractor will also comply with the labour and statutory requirements viz payment of ESI, EPF & GST etc. and payment to be made by cheque and details thereof to be submitted with the bill for payment. The operating cost would be escalated @ 7% per annum, till the expected life of 10 years of the machine, should the services of the Supplier/Contractor be taken beyond one year.*

S. No.	Component of Annual Operating Cost	20 TPD XAPER
1	Manpower Cost	Rs. 20,26,416/- (1 x Supervisor & 8 x Technicians)
2	Disposal cost of SCF	Rs. 15,44,400/-
Total Annual Operating Cost		Rs. 35,70,816/-

7. Disposal Cost: *Approved Supplier/Contractor may dispose off SCF (Segregated Combustible Fractions) to cement plants and Rs.7150/- per 5 MT of SCF will be paid to the Supplier/Contractor /OEM of the machines for the transportation and disposal of the SCF to any cement plant under their own arrangement. (Payment will be made by DCB on quarterly basis). However no SCF shall be kept in the premises and shall be transported to the cement plants or any other arrangement of the Supplier/Contractor on daily basis. Arrangements for weighing of the waste and SCF etc. shall be made by the Supplier/Contractor for the purposes of evaluations of the work/payments.'*

The operational and disposal rate mentioned above is unambiguous and leaves no doubt to hold that the firm is bound to dispose of the waste in the given rate. The demand of the firm from the department to agree on some other rates is not only unjustified but also contrary to the jurisprudence of contract. The firm is bound to adhere to the clauses of the agreement dated 24.01.2022. It is needless to mention that the firm has entered in this agreement with the department on its own free will. Therefore, it is held that the firm is unjustified in declining to work on the current rates as mentioned in agreement dated 24.01.2022.

6. The details of deduction made by the office are as under:

i. The plant was not functional for 25 days in the first quarter of the contract period. The operational cost for the machine for 01 month is Rs. 1, 68,868/-. Hence, Rs. 1, 47,078.80/- was illegally claimed by the firm in the bill.

ii. In this period the firm claimed the bill for disposal of 243.51 MT of SCF (Segregated Combustible Fractions) to cement plant. Whereas, the actual disposal of SCF made during this period was 203.51 MT. Therefore, the actual expenditure incurred by the Department was Rs. 2,42,300/- which includes Rs. 1,18,200/- for processing/dumping of 40 MT of waste to landfill site at Okhla, which is evident from the receipts generated from SDMC Okhla and Rs. 1,24,100/- which was spent on transporting 40 MT through the hired vehicles in 17 trips. The cost of processing/disposal of 1MT of waste at Okhla is Rs. 2955 and cost of 1 trip of vehicle carrying 5 MT of waste is Rs. 7300/-.

iii. GST amount of Rs. 1,55,622/- has not been paid as claimed by the firm as per Ministry of Finance, Government of India, Notification 12/2017 – Central Rate (Tax) dated 28.06.2017.

iv. The rate of disposal of 1 MT of waste as per agreement is Rs. 1430/-. However, the rates quoted by the firm for the disposal of 1 MT was Rs. 1470/-. In the said period 95 MT of waste was disposed. Therefore, the cost of disposing 243.51 MT of waste comes to Rs. 3,48,219.3/-.Whereas the firm claimed Rs. 3,57,960. Hence, Rs. 9740/- was deducted from the bill.

It is relevant to note that Clause 15 of the agreement dated 24.01.2022 gives sufficient power to the office to deduct the amount proportionately from the operating cost due to supplier/contractor in case the machine is not functional or not optimally functional. The relevant phrase of clause 15 is reproduced below:

'.....In case the machine is not functional or not optimally functional, amount would be deducted proportionately from the operating cost due to supplier/ contractor.'

In view of the above, it is held that the deductions made by the office from the bill of the contractor are in accordance with the agreement and justified. Further, the actions of the firm in claiming the bill for the periods on which the machine was not functional and claiming the rate of disposal of 1 MT at Rs. 1470/- instead of Rs. 1430/- are not only unethical but amounts to misleading the office.

7. Further, clause 5 of the agreement dated 24.01.2022 is reproduced below:

"5. The Supplier/Contractor shall follow scrupulously all labour laws and fulfil all statutory obligations towards those employed by him and shall also be the primary employer in terms of statutory provisions. No child labour shall be engaged."

The expression '.....shall also be the primary employer in terms of statutory provisions' used in the above quoted clause leaves no doubt to hold that the firm was liable to comply with all the statutory provisions required for the installation and operation of the plant.

The firm was negligent in not complying with these provisions at the first place. The failure of the firm in not complying with the provisions of environmental laws despite being informed by the Department is legally unsustainable.

8. It is relevant to note the actual expenditure incurred by the office in transporting and disposing the waste due to non-operation of the plant:

No.	Month	No. of Days when plant was not operational	Actual Cost incurred by the Department in processing (in Rs.)*	Actual Cost incurred by the Department in transport (in Rs.)*
1.	July, 2022	09	26595	262800
2.	August, 2022	14	41370	408800
3.	September, 2022	02	5910	58400
4.	October, 2022	09	26595	262800
5.	November, 2022	30	76830	759200
6.	December, 2022	31	76830	759200
7.	January, 2023	31	73875	730000
8.	February, 2023	14	41370	408800
9.	March, 2023	31	76830	759200
10.	April, 2023	30	73875	730000
11.	May, 2023	31	76830	759200
Total			596910	5898400
Total Actual expenditure incurred by the Department			Rs 64,95,310/-	

* Rs. 2955 per MT for processing of waste and Rs. 7300 per trip carrying 5 MT of waste for transportation.

Hence, the office has incurred an expenditure of Rs 64,95,310/- occurred due to non-operation of the plant. This amount is to be recovered from the firm on the account of negligence.

The clause 15 in this regard is extracted below:

15. Penalty Clause in relation to 'Zero Waste': The Supplier/Contractor would ensure the full and final disposal of the output of the machine. However, DCB retains the right to take over the entire compost generated as a result of the processing, for which the Supplier/Contractor would provide the same in a ready to use form after due sieving. The Supplier/Contractor would store the segregated combustible fractions (SCF) in a covered compartment within the

premises and make arrangements for the curing of the compostable material in the space provided to him. The premises would be subjected to inspection on a weekly basis for the disposal of the SCF and all other aspects of operation and maintenance of the machine and any default in this regard would invite a penalty @ 10% of the weekly operating cost of the machine for the first three defaults. In case of defaults after this, the CEO may in his discretion impose penalty upto 50% of weekly operating cost and on repeated defaults, may terminate the agreement at the risk and cost of the supplier/ contractor without any further notice and confiscate any amounts due to the supplier/ contractor. In case the machine is not functional or not optimally functional, amount would be deducted proportionately from the operating cost due to supplier/ contractor. In case of the repeated failure of the machine, CEO, DCB may in his discretion impose penalty upto 2 times this proportionate amount and if deemed necessary terminate the contract in part or full at the risk and cost of the supplier/ contractor and recover the amount from any monies due the supplier/ contractor.

The reading of the above quoted clause clarifies that on the failure of the firm to ensure smooth operation of the plant penalty @ 10% of the weekly operating cost of the machine will be imposed on the firm for the first three defaults, on subsequent defaults penalty upto 50% can be imposed and on repeated defaults agreement can be terminated at the risk and cost of the contractor/firm. Further, if the machine is not functional or optimally functional then amount will be proportionately deducted and in case of repeated failures penalty upto 2 times of the proportionate amount may be imposed.

9. Clause 16 of the agreement regarding penalty on the Contractor in case of any deficiencies of performance or negligence is reproduced below:

'16. The Supplier/Contractor understands that the project is of utmost importance to the citizens of Cantt area and to the Delhi Cantonment Board and shall take all due diligence in installing and operating the machinery. Any negligence or deficiency in performance will adversely effect the health and hygiene of the citizens and bring avoidable administrative difficulties and dispute to the Board. The supplier/contractor understands that there is no room for any error or deficiency of service and performance. CEO, DCB may at his discretion impose any penalty on the Supplier/Contractor in case of any deficiencies of performance or negligence by the Supplier/Contractor.'

10. Further, the clause regarding the forfeiture of performance security amount is reproduced below:

22. Performance Security: The Supplier/Contractor shall be required to submit 03% of the cost of completion of work as performance security (including amount of earnest money deposit) in the form of Bank draft/irrevocable bank Guarantee from Nationalized Bank valid for period of 02 years after date of completion of work (defect liability period). The performance security would be released after expiry of defect liability period.

In case of any defects observed in the work done by the Supplier/Contractor the Store-Procurement-incharge will notify the defects to the Supplier/Contractor giving reasonable time as per his discretion from rectification of defects and if Supplier/Contractor fails to rectify the defects within stipulated period the Board shall be at liberty to get the defects rectified from any agency of its choice at the risk and cost of the Supplier/Contractor and expenditure incurred in this regard would be adjusted from the performance security.

This is a case of repeated failures as the firm deliberately and intentionally halted the operation of the plant by not processing the municipal waste despite the several orders of the Department to make the plant functional. This not only caused the Board to incur expenditure for transporting and disposal of waste but also jeopardized the health and hygiene of the Cantt. residents.

11. In view of the above, the following recommendations are made:

- (i) The agreement dated 24.01.2022 should be terminated on account of non-performance of the contract.
- (ii) Further, imposition of penalty as per the clauses of the contract to be calculated by the office taking into account the additional expenditure and damages to be recovered from the amounts due to the contractor including the performance security and other deposits if any.
- (iii) Blacklisting of the firm and debarring them from participating in any future tenders of the Board.
- (iv) Alternative arrangements to be made for operating the equipment for effective processing and composting of solid waste.

A copy of this report be forwarded to the firm.


(Abhijeet Sirohi) 7/4/22
Jt. Chief Executive Officer
Delhi Cantonment

unauthorised construction. The Board further resolved that in the event of non compliance of the notices by the person concerned, the CEO, Member-Secretary will issue notice under section 320 of the Cantonments Act, 2006 giving them 15 days time to demolish the said unauthorised construction failing which the unauthorised construction shall be demolished by the office at the risk and cost of the person concern.

WITH THE PERMISSION OF CHAIR FOLLOWING SUPPLEMENTARY ITEMS WERE ALSO CONSIDERED:-

10. OPERATION AND MAINTENANCE OF WASTE PROCESSING CUM COMPOSTING MACHINE.

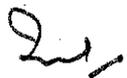
Reference CBR No 40(i) dated 18.10.2022 on the subject.

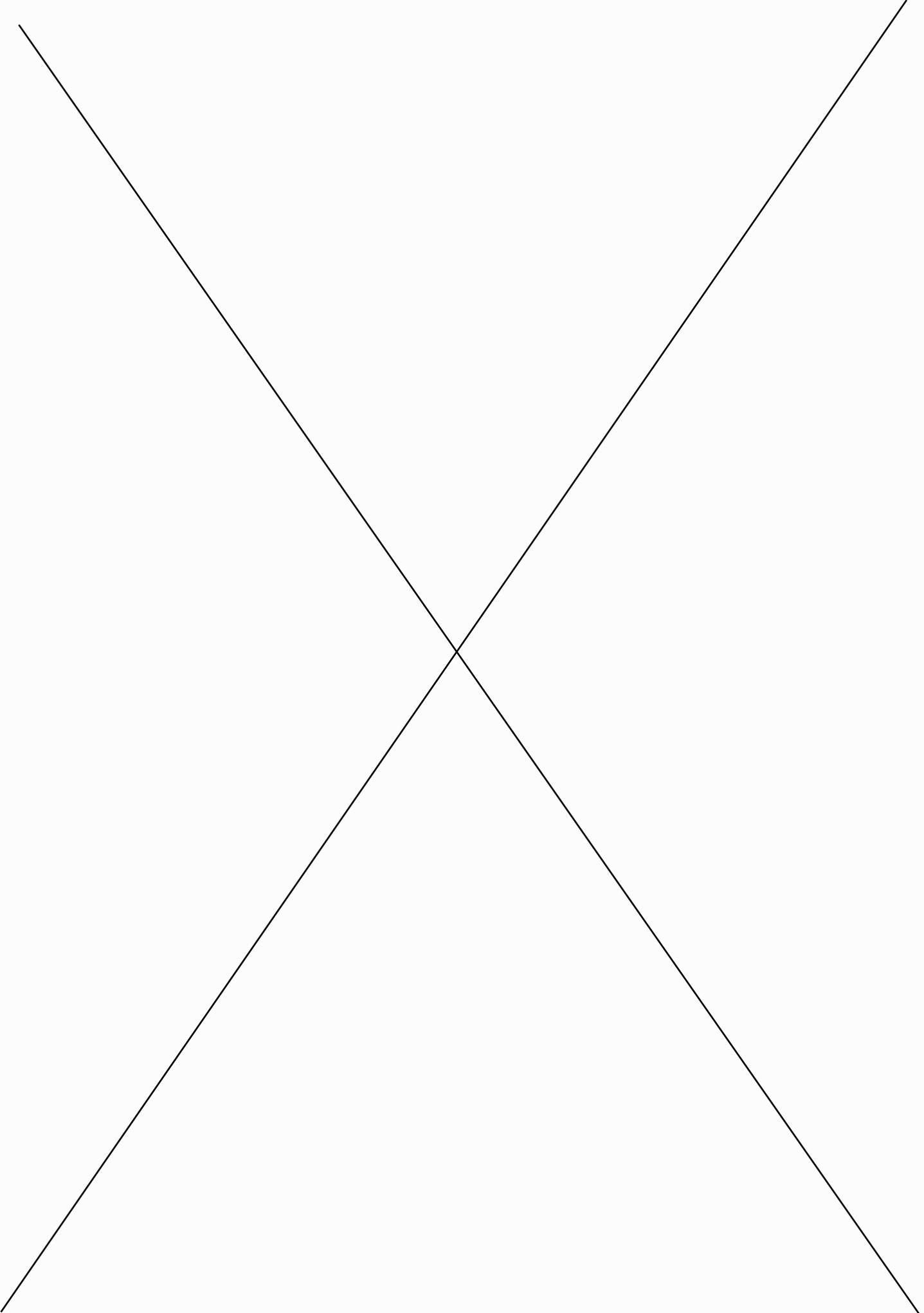
To consider the detailed proceedings/report of the Jt. Chief Executive Officer on the issue of breach of conditions and failure to perform the contract for operation and maintenance of Solid Waste Processing cum Composting Machine by M/s Xaper Waste Solutions Pvt Ltd as per the agreement executed by them. The Board may consider the recommendations made therein and decide further course of action on the issue.

10. Considered, The Board examined in detail the report of the Jt. Chief Executive Officer regarding the breach of conditions and failure to perform the contract for operation and maintenance of Solid Waste Processing cum Composting Machine by M/s Xaper Waste Solutions Pvt Ltd. The Board also examined the files and perused correspondence made in this regard. After detailed discussion and examination, the Board agreed with the recommendations of the Jt, CEO which are carefully arrived at after extensive scrutiny of the facts submitted by the office, clauses of agreement and the written replies/ submissions of the firm. The Board is satisfied that sufficient opportunities have been given to the firm to enable it to fulfil its contractual liability and no further delay can be made especially in view of the primacy of health and hygiene in the Cantonment area. The Board further directed that the agreement dated 24.01.2022 should be terminated on account of non-performance of the contract. The Board further resolved that the firm should be blacklisted/debarred from participating in any of the future tenders of the Board. The office is directed to forfeit the amounts due to the firm and CEO should impose a penalty as per the clauses of agreement and initiate action for recovery and realization of amounts thereupon. The Nominated Member requested Board to consider the shifting of waste processing and composting facility as already decided in CBR referred on the agenda side. The Board discussed the matter and noted that this decision shall be in compliance with the Hon'ble NGT order dated 20.02.2023 in O.A. No 694/2022 titled as Bhupinder Singh Vs Govt of NCT of Delhi & Ors wherein Board was directed to shift the said machine from Tigris Road to some other suitable location by 30.09.2023. The Board resolved to approve the shifting and CEO is requested to take necessary action in this regard.


(CEO, Member-Secretary)

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(President Cantonment Board)



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IN THE COURT OF

Suit/Appeal No. CWP/CC OA No. 694/2022 OF 2022

IN re: Bhupinder Singh PIFF/APPL/

Petitioner/Accused.

VERSUS

State of NCT Delhi & Ors. Defnt/Respondent/Accused.

KNOW ALL to whom these present shall come that I/We Xaper Waste Solution Pvt. Ltd. have authorized to advocate Manreet Kaur, NITESH to Respondent (U.S.) the above named do hereby appoint.



MANREET KAUR (P/2114/2013) NITESH (D/2025/2019)
ADVOCATES & SOLICITORS
A-30, KAILASH COLONY, NEW DELHI-48 NITU SHARMA (UP/16065/2021)
08054909094, TELEFAX # 011-29238165
E-mail: advocatereet04@gmail.com

I/We the undersigned (the advocate/s) to be my/our Advocate in the above-noted case authorized him:

To act. Appear and plead in the above-noted case in the court or in any other court in which the same may be tried or heard and also in the appellate court including high court subject to payment of fees separately for each court by me/us.

To sign. File verify and present pleadings, appeals cross-objections or petitions for execute on review, revision, withdrawal, compromise or other petitions or affidavit. Or other document as may be deemed necessary or proper for the prosecution of the said case in all its stages subject to the payment of fees for each stages.

To file and take back documents to admit and or deny the documents of opposite party.

To withdraw or compromise the said case or submit to arbitration and differences or disputes that may arise touching or in any manner relating to the said case.

To take execution proceedings.

To deposit draw and receive money, cheques, cash and grant receipts there of and to do all other acts and things which may be necessary to be done for the progress and in the course of the prosecution of the said case.

To appoint and instruct any other legal practitioner, authorizing him to exercise the power and authority hereby conferred upon the advocate whenever he may think fit to do so and to sign the power of attorney on our behalf.

And I/We the undersigned do hereby agree to ratify and confirm all acts done by the advocate or his substitute in the matter as my/our own acts, as if done by me/us to all intents and purposes.

And I/We undertake that I/We or my/our duly authorized agent would appear in the court on all hearing and will inform the advocate for appearance when the case is called.

And I/We undersigned do hereby agree not to hold the advocate or his substitute responsible for the result of the said case. The adjournment costs whenever ordered by the court be of the advocate which he shall receive and retain himself.

And I/We the undersigned do agree that in the event of the whole or part of the fee agreed by me/us to be paid to the advocate remaining unpaid he shall be entitled to withdraw from the prosecution of the said case until the same is paid up, the fees settled is only for the above case and court. I/We hereby agree that once the fee is paid. I/We will not be entitled for the refund of the same in any case whatsoever if the case lasts for more than three years, the original fee shall be paid again by me/us.

IN WITNESS WHERE OF I/we do hereunto set my/our hand to these presents the contents of which have been understood by me/us on this day of Dec. 20 23 Accepted subject to the terms of fees.

Advocate
Manreet Kaur
(P/2114/2013)
NITESH
(D/2025/2019)

For Xaper Waste Solutions Pvt. Ltd.
Client
Mg. Director

Xaper Waste Solutions Pvt.Ltd.

Formely : E3 Waste Solutions

H.O : Sodal Saipur Road, Industrial Area, Jalandhar.144004 Punjab India M. 9872900042, 9041532051

✉ info@e3wastesolutions.com 🌐 www.e3wastesolutions.com

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CERTIFIED TRUE COPY OF THE RESOLUTION PASSED AT THE MEETING OF BOARD OF DIRECTORS OF M/s XAPER WASTE SOLUTIONS PVT. LTD. HELD ON 04-12-2023 AT ITS REGISTERED OFFICE AT SODAL SAIPUR ROAD ,PALTA MARKET JALANDHAR.

To verify the Registered Office of the Company:

“RESOLVED THAT” pursuant to the provision of Section 12 Of the Companies Act,2013 read with rules made thereunder (including any statutory modification(s) and re-enactment thereof) the registered office of the company be situated at **SODAL SAIPUR ROAD, PALTA MARKET, JALANDHAR,144004.**

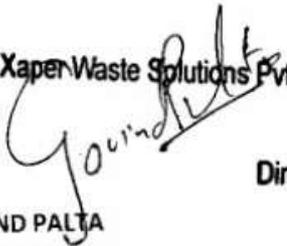
“RESOLVED FURTHER THAT The Mr. Ajay Palta(Mg. Director) is hereby authorized to sign all the documents related to legal proceedings initiated before NGT(National green tribunal) on the behalf of the company.

CERTIFIED TRUE COPY

On the behalf of,

XAPER WASTE SOLUTIONS PRIVATE LIMITED

For Xaper Waste Solutions Pvt. Ltd.



Director

GOVIND PALTA

DIRECTOR

DIN : 08556159

Address : 95, ADARSH

NAGAR, JALANDHAR