598

OFFICE OF THE CHIEF SECRETARY
GOVERNMENT OF SIKKIM
GANGTOK

Ref. No. 48/CS/SKM/2024 Date: 01.07.2024

To

The Hon'ble Mr. Justice Prakash Shrivastava,
Chairperson,
NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH,
Faridkot House, Copernicus Marg,
Near India Gate,
New Delhi – 110011.

Sub: Submission of the Six-Monthly Progress Report in compliance with order dated 07.12.2023 passed in O.A. No. 606/2018 in the matter of compliance of Municipal Solid Waste Management Rules, 2016 (State of Sikkim).

Hon'ble Sir,

Kindly find enclosed herewith the Six-Monthly Progress Report pertaining to the State of Sikkim in compliance with order dated 07.12.2023 in O.A. No. 606/2018 in the matter of compliance of Municipal Solid Waste Management Rules, 2016.

For favour of kind information and such directions as may be considered necessary, please.

Thanking you,

OFFICE OF THE CHIEF SECRETARY ★ GOVERNMENT OF SIKKIM, GANGTOK ★

Yours sincerely,

(V.B. Pathak) IAS 1/7/2024.
Chief Secretary,
Government of Sikkim.

Encl. as above.

BEFORE THE NATIONAL GREEN TRIBUNAL, PRNCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 606 OF 2018
COMPLIANCE OF MUNICIPAL SOLID WASTE MANAGEMENT RULES, 2016 AND OTHER ENVIRONMENTAL ISSUES.
SIX MONTHLY PROGRESS REPORT WITH RESPECT TO SIKKIM

Submissions before the Hon'ble National Green Tribunal, PB with respect to observations in paragraph 4 of the order dated 07.12.2023 in the above said matter.

ONWARDS IN THE MATTER OF O.A. No 606/2018 BEFORE HON'BLE NGT

Hon'ble NGT's Observation No. 1.

With regard to solid waste in urban local bodies the total generation is 68.9 tons per days while processing is done for 23.75 tons per day while 45.15 tons per day is dumped in landfill sites.

State's submission:

1. The total generation of solid waste for FY 2023-24 is 69.68 tons per day whereas total **waste processing has shown remarkable improvement from 34.47% to 52.48%.** The details of waste generation & waste processing as per Annual Report submitted by ULBs for the FY 2023-24 is placed at **Annexure I** .
2. Material Recovery Facilities (MRF) have been constructed and made functional in all the ULBs to facilitate segregation and transportation of the recyclable waste materials to the recycling plants preventing such materials to be dumped in the landfill. This also allows the ULBs to generate revenues through disposal of recyclables.
3. The MRFs have been provided Bailing Machines in all ULBs to manage their dry waste by reducing volume and making it easier for ULBs to transport to the recyclers. Further, weighing machines with a capacity of one tonne have been provided to all the ULBs.
4. Five (05) Nos of PET Bottle Shredding Machines have been installed at the following ULBs
    a. 02 Pet Bottle Shredding Machine are installed at MG Marg, the heart of town with highest footfall.
    b. 01 No of Pet Bottle Shredding Machine at Namchi Taxi stand where the movement of tourist and locals are heavy.
    c. 01 No of Pet Bottle Shredding Machine at the main highway of Rangpo Bazaar, gateway to the State.
    d. 01 No of Pet Bottle Shredding Machine at Jorethang near the Taxi Parking Plaza.

5. Gangtok Municipal Corporation has delivered 49.15 MT of post consumer multilayered plastic packaging (Category-3 as per Clause 5.1 of EPR Framework) through M/s Swachh Sustainable Solutions Pvt. Ltd on behalf of Dabur India Limited for fulfilling the EPR

obligations from Gangtok in Sikkim for pre and / or co-processing in cement kiln during the period 1.02.2024 to 29.02.2024. The copy of documents is enclosed at **Annexure II** for reference.

6. Engagement of Self Help Groups and NGOs in collecting segregated waste from door to door has also contributed towards proper management of household waste.
7. Peer Learning Program was also conducted on 20/2/2024 at Mangan Nagar Panchayat where officials from Mangan shared their knowledge on management & handling of Municipal Solid Waste and their best practices under SBM(U).
8. The ULBs have also initiated several activities, including aggressive IEC activities for bringing awareness and behavioural changes among the citizens.
9. Night shift for better collection of waste from NH10 highway within Gangtok Municipal Corporation jurisdiction was started from September, 2023.
10. Gangtok Municipal Corporation has also deployed casual labour for better segregation of waste at MRF centre at Martam beside waste pickers.
11. As per the mandate of Solid Waste Management Rules, 2016 and strict enforcement by Gangtok Municipal Corporation, Hotel Mayfair, being a Bulk Waste Generator has installed compost plant at its premises and is functional.
12. Hazardous waste collection centre is established at Lall bazaar.
13. Reuse-Reduce-Recycle Centres have been established in all ULBs for collecting old/used clothes to avoid being dumped in the landfill.

Hon'ble NGT'sObservation No. 2.

Further, legacy waste of 1, 50,000 is accumulated in Gangtok for which bio mining is proposed. With regard to Martam Landfill the equipment for bio mining of the legacy waste is being mobilized but no bio mining has started. The details with regard of methods of bio mining, its segregation, utilization and final disposal is not spelled out. Since the legacy waste is unattended and with the existing daily solid waste getting accumulated which is 45.15 tons per day the waste accumulation as a legacy waste would become untreatable leading to huge contamination of soil, leachate generation apart from harming birds and other fauna.

State's Submission:

1. Total quantification of legacy waste at Martam landfill was conducted by Nangia & CO LLP, wherein it was found that the total quantity of legacy waste at the landfill is actually 2,33,823.00 MT (Two lakh thirty-three thousand eight hundred twenty-three).
2. The Bio-Mining work has started at the Martam Landfill through the **Trench Method**. The methodology used is as hereunder:

(a) JCB is used to excavate and dig 2-2.5 meter-deep trenches downwards from the top of the legacy waste heap at 1.5-to-2 meter intervals.

(b) Uppermost layer is sliced into the in-situ wind-rows. Mist-spray is then sprayed on the sides of the trenches to get microbes to reach exposed waste surfaces.
(c) Thereafter, the windrows are covered with breathable cover to avoid rain water entering the windrows.
(d) These slices are then brought to form terraces and turned to one aerated windrow onto another weekly before repeating the process until almost ground level is reached.
(e) Screening is started once moisture level is low and adequate for processing.

The following equipment have been installed which are per CPCB guidelines:

1. Three Trommel set with capacity 50 Tonnes per hour.
2. Air density separator to separate plastic and RDF and moving bed feeder conveyor for better material loading and stone removal.
3. Terex Warrior -1200 double deck machine. This machine gives an output of 60-70 MT/per hour and generates three fractions (RDF, good earth and inert).
4. Shredder for RDF which improves calorific value and is easily accepted by cement plants and Waste to energy plants.

Around 40% of the work has been completed till the month May, 2024. A total of 92,530 MT out of 233,000 MT of legacy waste has been bio mined. The total quantity of rejects generated is 14,875 tons which has been in the process of transporting to cement and co-processing plant.

(i) C&D and inert is being used in filling low lying areas.

(ii) Regarding use of good earth for landscaping and horticulture purposes, Departments like Forests, Agriculture and Horticulture have been approached for collecting it from the landfill site.

(iii) Qualissure Laboratory Services, Kolkata was engaged to test air, water and soil quality atthe landfill site as per CPCB norms. All the test reports have been found to be satisfactory and well within the limits prescribed by CPCB. The report copies are placed as **Annexures III-VII**.

Hon'ble NGT'sObservation No. 3*:*

The Bio-Methanation plant of 5 MT has been commissioned but no details of the utilization of the gas generation the gas pipeline connected to household etc. has not been indicated.

State's Submission: NISARGRUNA Bio-Methanation plant is the technology developed by Bhaba Atomic Research Centre, Department of Atomic Energy, Government of India, Mumbai. This plant having the capacity of 5 MT was established at landfill site at Martam through Science and Technology Interventions in North Fast (STINER) under Advocacy and Publicity Scheme

funded by Ministry of DoNER, North-East Council is the Nodal Agency of the project while North Eastern Development Finance Corporation Ltd. (NEDF), Guwahati is the Implementing Agency,

Department of Science and Technology, Government of Sikkim has facilitated the establishment of the plant in collaboration with Gangtok Municipal Corporation which is the end user of this plant

The main objectives of this project is

1. Generation of 60 -80m3 biogas from 1 MT of bio degradable waste which can produce about 90-120 KWH power.
2 Generation of Good quality manure.
3. Prevents methane escape to atmosphere.

The gas produced by the Plant will be used to generate electricity to light up the landfill area:

Hon'ble NGT's Observations No. 06:

With regard to sewage management details of 09 Sewage Treatment Plant (STPs) have been provided but their functioning and the outlet water quality has not been provided. Further the utilization of the treated water has also not been indicated.

State's Submission: Brief on sewage management of Sikkim

I. **Total Population:** a) Urban Population - 153,578 (Census of India, 2011)

1.74 lakhs (UIDAI data, May, 2020)

b) Rural Population - 456,999 (Census of India, 2011)

5.16 lakhs (UIDAI data, May, 2020)

II. Estimated Sewage Generation (MLD):

Urban – 18.79 MLD (assuming water supply @ 135 litres per capita per day (lpcd) and 80 % of it as the waste water generation as per State Public Health Engineering Department).

III. Details of Sewage Treatment Plant in Urban Areas:

Existing no. of STPs and Treatment Capacity (in MLD):

Sl. No.	Town/Location	Capacity (MLD)	Operational/ Functional Capacity(MLD)	Actual flow (MLD)
1.	Gangtok Zone I, Adampool	8.0	7.50	6.50
2.	Gangtok Zone I, Adampool	4.69	4.50	3.90
	Gangtok Zone I, Adampool	Old 5.0 MLD conventional treatment plant is utilized as secondary treatment unit		Re-circulated from MBBR units
3.	Gangtok Zone I, Ranipool	1.27	1.10	0.92
4..	Gangtok Zone IV, Lower Sichey	3.90	3.30	2.80
5.	Singtam	~~0.66~~	Entire visible treatment plant units are washed away by the flash flood of October 2023. Temporary restoration for treatment of sewage has been done by diverting the flow to individual household septic tanks. Proposal for permanent restoration already submitted to the concern authorities for sanction.	
6.	Melli	~~0.50~~		
7.	Rangpo	~~1.40~~		
8.	SMIT, Majhitar (private facility)	0.48	0.40	0.40
9.	Gangtok Zone II, Lower Syari	1.60	1.50	1.0
Total		**19.94**	**18.30**	**15.52**

IV. Sewage Management in Urban Areas:

a) **Capacity Utilization of existing STPs:** An average of 15.52 MLD of raw sewage is received in the operational STPs against the functional/operational capacity utilization of 18.30 MLD at present.

b) **MLD of sewage being treated through Alternate technology:** Sewage of towns and areas where there is no Sewage Treatment Plants is being treated through anaerobic digestion in the septic tanks of individual households. Estimated treatment facilities through septic tanks in **urban towns alone** account for 10.00 MLD.

c) The latest report of analysis conducted by third party National Accreditation Board for Testing and Calibration Laboratories **(NABL)** accredited laboratory of treated effluent from operational STPs have been attached as **Annexure VIII (a,b,c,d,e,f)** for kind reference please. The parameters analysed are PH, Biochemical Oxygen Demand (BOD mg/l)) Chemical Oxygen Demand (COD mg/l), Faecal coliform (MPN/100ml) and Total Suspended Solids (TSS mg/l).

d) The State Public Health Engineering Department (PHED) has explored possible uses of treated waste water for secondary purposes (non potable). A meeting in this regard was conducted with user agencies like Forest & Environment Department, Roads & Bridges (PWD) Department, National Highway Infrastructure Development Corporation Ltd(NHIDCL), Ministry of Road Transport and Highway (MORTH),Government of India, Rural Development Department and Agriculture Department. As deliberated in the meeting, areas of uses shall be watering in avenue plantation, extinguishing forest fire, dust mitigation and road pavement construction works and recharging aquifers. Accordingly, the PHED has initiated construction of treated waste water hydrant at the STPs to facilitate drawl by the user agencies.

V. Estimated Sewage Generation (MLD) in Rural and Peri-urban Areas:

Rural and peri-urban areas – 21.41 MLD (assuming water supply @ 55 liters per capita per day (lpcd) as per the JJM Guidelines and 80% of it as the wastewater generation as per State Public Health Engineering Department).

VI. Faecal Sludge Management in Rural and Peri-Urban Areas:

The Faecal Sludge Management in rural and peri urban areas of the State are being done through anaerobic digestion in the septic tanks, Twin pits and soak pits of individual household's toilets, community and institutional toilets and wherever possible through sewer line connections. Cesspool vehicle facilities are available for emptying services and safe disposal in nearby STPs.

Hon'ble NGT's Observation No. 7:

During the hearing the counsel had indicated that during the recent flash flood the existing STPs (Sewage Treatment Plants) were damaged and these are under renovation. Details of such STPs and renovation/ up gradation of the STPs may be provided along with proposed STPs to address the gap.

State's Submission:

Sl. No.	**STP damaged due to flash flood with location and capacity**	**Current Status**
1.	Singtam (0.66 MLD)	Entire visible treatment plant units are washed away by the flash flood of October 2023. Temporary restoration for treatment of sewage has been done by diverting the flow to individual household septic tanks. Proposal for permanent restoration already submitted to the concern authorities for sanction
2.	Rangpo (1.40 MLD)	
3	Melli (0.5 MLD)	

After taking up the temporary restoration works, the proposal for permanent restoration has been prepared by the state PHED and submitted to the Ministry of Home Affairs, Government of India and Post Disaster Need Assessment (PDNA) through Sikkim State Disaster Management Authority (SSDMA) under Land Revenue & Disaster Management Department (LR&DMD), Government of Sikkim for sanction. The State PHED has also submitted a requisition to the Ministry of Jal Shakti (MoJS) for sanction of special grant to take up permanent restoration works. The proposal is under consideration by the National River Conservation Directorate (NRCD) Ministry of Jal Shakti (MoJS), Government of India.

Hon'ble NGT's Observation No. 08:

*There is also a mention of 33 Mobile Treatment Units (MTU) which are being procured at the cost of Rs. 8.25 Cr. The utility of such mobile treatment units, the process adopted and the final discharge of such effluent from the MTU along with the quality intended has not been disclosed***.**

State's Submission: Mobile septage Treatment Unit (MTU) is an onsite septage treatment technology by WASH (Water, Sanitation and Hygiene) Institute. MTU is a treatment system installed on a truck which can treat the septage of septic tanks. The main process flow of treatment is as given below:

First step – Solid and Liquid separation
Second step – Sludge (solid) thickening through centrifuge
Third step – Liquid treatment through membrane filtration
Fourth step – Thickened solid is taken for secondary treatment
Final step – Treated effluent is safe for disposal on site itself or can be used for gardening.

MTU is designed for emptying and on-site treatment of septage from household septic tanks only.

Technical Committee chaired by the Principal Scientific Advisor, GoI has vetted and approved the MTU during August 2023.

Technical specification of MTU has been attached as Annexure –IX for kind reference please.

Mobile Treatment Unit is being taken up on pilot basis as an alternative technology for safe treatment of Faecal Sludge (septage) to reduce the burden on STP. State Rural Development Department is in the process of procurement of 07 MTUs initially on trial basis.
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ANNUAL REPORT OF SOLID & PLASTIC WASTE of Urban Local Bodies

F. Y- 2022-2023					
SOLID WASTE Tonn per day					
ULBS	GENERATED	COLLECTED	PROCESSED	% PROCESSED	DUMPED
GANGTOK	48	48	17	35.42%	31
NAMCHI	4.8	4.8	1.5	31.25%	3.3
GYALSHING	2	2	0.5	25.00%	1.5
NAYABAZAR-JORETHANG	5.6	5.6	2.5	44.64%	3.1
MANGAN	1	1	0.5	50.00%	0.5
RANGPO	4.8	4.8	1.25	26.04%	3.55
SINGTAM	2.7	2.7	0.5	18.52%	2.2
TOTAL	68.9	68.9	23.75	34.47%	45.15

F. Y- 2023-2024					
SOLID WASTE Tonn per day					
ULBS	GENERATED	COLLECTED	PROCESSED	% PROCESSED	DUMPED
GANGTOK	49.12	49.12	24.08	49.02%	25.04
NAMCHI	5	5	3.1	62.00%	1.9
GYALSHING	2.2	2.2	1.2	54.55%	1
NAYABAZAR-JORETHANG	5.5	5.5	3.5	63.64%	2
MANGAN	0.76	0.76	0.49	64.47%	0.27
RANGPO	4.1	4.1	2.7	65.85%	1.4
SINGTAM	3	3	1.5	50.00%	1.5
TOTAL	69.68	69.68	36.57	52.48%	33.11

F. Y- 2022-2023					
PLASTIC WASTE(Tonn per year)					
ULBS	GENERATED	COLLECTED	RECYCLED/ REUSE	% PROCESSED	DUMPED
GANGTOK	37.5	37.5	33	88.00%	4.5
NAMCHI	6.94	6.94	5.64	81.27%	1.3
GYALSHING	1.4	1.4	0.6	42.86%	0.8
NAYABAZAR-JORETHANG	4.4	4.4	2.2	50.00%	2.2
MANGAN	5	5	4.8	96.00%	0.2
RANGPO	32	32	29	90.63%	3
SINGTAM	1.4	1.4	0.7	50.00%	0.7
TOTAL	88.64	88.64	75.94	85.67%	12.7

F. Y- 2023-2024					
PLASTIC WASTE(Tonn per year)					
ULBS	GENERATED	COLLECTED	RECYCLED/REUSE	% PROCESSED	DUMPED
GANGTOK	134	134	131	97.76%	3
NAMCHI	2.756	2.76	1.87	67.85%	0.89
GYALSHING	1.36	1.36	0.8	58.82%	0.56
NAYABAZAR-JORETHANG	4.5	4.5	3	66.67%	1.5
MANGAN	4.8	4.8	4.6	95.83%	0.2
RANGPO	10.8	10.8	8.8	81.48%	2
SINGTAM	2.5	2.5	1	40.00%	1.5
TOTAL	160.716	160.72	151.07	94.00%	9.65

Annexure II

277

Dalmia cement
FUTURE TODAY

cement! sugar! refractories! power!

Certificate of Co-Processing

Issued To : Swachh Sustainable Solutions Pvt. Ltd.

Certificate No : DCBL/SSSPL/24

Date : 14-02-2024

This is to certify that we have received the following quantities of **49.15 MT** of Post Consumer Multi Layer Plastic Packaging (Category-3 as per clause 5.1 of EPR Framework*) sent by M/s./**s. Swachh Sustainable Solutions Pvt. Ltd** on behalf of **Dabur India Limited** for fulfilling the EPR obligations, from **Gangtok** in **Sikkim** for Pre and / Or Co-processing in our Cement Kiln during the period **01-02-2024 to 29-02-2024**. The same would be safely and completely disposed off within 90 days of receipt and thereafter will not exist. We certify that the following mentioned quantity has not been accounted for / billed to any other entity.

Waste Name: Post Consumer Multi Layer Plastic Packaging (Category-3 as per clause 5.1 of EPR Framework*)

Quantity (Tons) : 49.15

For, Dalmia Cement (Bharat) Ltd

Authorised Signatory

Authorised Signatory

Name: Raju Ranjan Prasad
Designation: Unit Head

*As per the Guidelines notified on 16th Feb 2022 w.r.t Extended Producer Responsibility for Plastic packaging

(218)

Dalmia cement
FUTURE TODAY

cement! sugar! refractories! power!

Receipt details for the period **01-02-2024 to 29-02-2024** for **Gangtok In Sikkim.**

Collection State	Collection City	Vehicle Details	Date of Receipt	Quantity received (MT)	Type of Plastic Waste	Co-processor name & location
Sikkim	Gangtok	WB57E5194	1-2-2024	9.78	Post Consumer Multi Layer Plastic Packaging	Dalmia Cement (Bharat) Limited,Meghalaya
Sikkim	Gangtok	WB57F1183	3-2-2024	10.68	Post Consumer Multi Layer Plastic Packaging	Dalmia Cement (Bharat) Limited,Meghalaya
Sikkim	Gangtok	AS01LC4819	2-2-2024	9.11	Post Consumer Multi Layer Plastic Packaging	Dalmia Cement (Bharat) Limited,Meghalaya
Sikkim	Gangtok	WB71C0786	6-2-2024	9.91	Post Consumer Multi Layer Plastic Packaging	Dalmia Cement (Bharat) Limited,Meghalaya
Sikkim	Gangtok	WB71B9378	10-2-2024	9.67	Post Consumer Multi Layer Plastic Packaging	Dalmia Cement (Bharat) Limited,Meghalaya
Total Quantity in MT				49.15		

For, Dalmia Cement (Bharat) Ltd

Authorized Signatory

Qualissure Laboratory Services
361, Prantick Pally, 45/361, Bose Pukur Road, Kolkata -700107
Email : qualissure@gmail.com; info@qualissure.com ; Mob.No. 98312 87086 ; 9830093976
TC-6271

DOC NO : QLS/SAMP/08-A/00

TEST REPORT

Name & Address Of the Customer :		
M/s. GNS Builders 32 no. Martam Landfill, Gangtok, Sikkim-737101	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/MR/A/24-25/C/176 : 10.06.2024 : QLS/MR/A/24-25/176 : Ambient Air : 04.06.2024-10.06.2024 : Near Processing Site : Verbal Confirmation

Analysis Result

Location : Near Processing Site			Date of sampling : 01-02.06.2024	
Sampling Done by: C.Sahoo			Sampling done as per : CPCB Guidelines (Volume-1)	
Environmental Condition : Cloudy & Partly Rain				
Sl. No.	**POLLUTANT**	**RESULT**	**LIMIT**	**METHOD OF TEST REFERENCE**
1	Particulate matter (<10µm) in µg/m^3	51	100	IS: 5182 (Part-23)- (RA-2017)
2	Particulate matter (<2.5µm) in µg/m^3	26	60	USEPA CFR-40,Part-50, Appendix-L
3	Sulphur dioxide (SO_2) in µg/m^3	6.5	80	IS: 5182 (Part-2)-2001, (RA-2017)
4	Nitrogen dioxide (NO_2) in µg/m^3	26.3	80	IS: 5182 (Part- 6)- 2001, (RA-2017)
5	Carbon Monoxide (CO) in mg /m^3	0.778	2	IS: 5182 (Part- 10):1999, (RA-2014)
6	Ammonia (NH_3) in µg/m^3	11.6	400	Air Sampling , 3rd Edn -Method-401
7	Ozone (O_3) in µg/m^3	<19.62	180	Air Sampling , 3rd Edn -Method-411
8	Lead (Pb) in µg/m^3	<0.01	1	EPA IO-3.2 & 5.0
9	Nickel (Ni) in ng/m^3	<4.0	20	EPA IO-3.2
10	Arsenic (As) in ng/m^3	<1.0	6	Air Sampling , 3rd Edn.Method 402 and APHA 22nd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m^3	<2.08	5	IS: 5182 (Part- 11)
12	Benzo (a) pyrene in ng/m^3	<0.4	1	IS: 5182 (Part- 12)
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.				

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

-------End of Report--------

Qualissure Laboratory Services
361, Prantick Pally, 45/361, Bose Pukur Road, Kolkata -700107
Email : qualissure@gmail.com; info@qualissure.com ; Mob.No. 98312 87086 ; 9830093976
TC-6271

DOC NO : QLS/SAMP/08-D/00

TEST REPORT

Name & Address Of the Customer:		
M/s. GNS Builders 32 no. Martam Landfill, Gangtok, Sikkim-737101	Report No.	: QLS/MR/W/24-25/C/182
	Date	: 10.06.2024
	Sample No.	: QLS/MR/W/24-25/182
	Sample Description	: Surface Water
	Sample Location	: River Water
	Date of Performance(s)	: 04.06.2024-10.06.2024
	Sample Collected On	: 02.06.2024
	Sampling Method	: APHA 24thEdition, 1060 B
	Ref No. Date	: Verbal Confirmation

Analysis Result

Sl. No.	Test Parameter	Test Method	General Standards For Discharge Of Environmental Pollutants To Inland Surface Water Part-A: Effluents (CPCB)	Result
1	pH Value at 25°C	APHA 24th Edition-2023, 4500-H+ B	5.5 to 9.0	7.17
2	Electrical Conductivity in µS /cm at 25 °C	APHA 24th Edition-2023, 2510B	--	229
3.	Arsenic (as As) in mg/l	APHA 24th Edition-2023, 3114B	0.2	<0.01
4.	Cadmium (as Cd) in mg/l	APHA 24th Edition-2023, 3111B	2	<0.002
5.	Total Chromium (as Cr) in mg/l	APHA 24th Edition-2023, 3111B Cr	2	<0.05
6.	Chromium (as Cr^{+6}) in mg/l	APHA 24th Edition-2023, 3500B Cr	0.1	<0.05
7.	Copper (as Cu) in mg/l	APHA 24th Edition-2023, 3111B	3	0.04
8.	Mercury (as Hg) in mg/l	APHA 24th Edition-2023, 3112B	0.01	<0.001
9.	Nickel (as Ni) in mg/l	APHA 24th Edition-2023,3111 B	3	<0.02
10.	Lead (as Pb) in mg/l	APHA 24th Edition-2023,3111 B	0.1	<0.01
11.	Zinc (as Zn) in mg/l	APHA 24th Edition-2023,3111 B	5	0.08
12.	Chemical Oxygen Demand (as COD) in mg/l	APHA 24th Edition-2023, 5220B	250	6
13.	Biochemical Oxygen Demand (as BOD) for 3 days at 27 °C in mg/l	IS 3025 (Part 44)- 1993, RA: 2019	30	<2
14.	Chloride (as Cl) in mg/l	APHA 24th Edition-2023, 2130 B	--	35.2
15.	Total Dissolved Solids (as TDS) in mg/l	APHA 24th Edition-2023, 2540 C	--	148
16.	Total Suspended Solids (as TSS) in mg/l	APHA 24th Edition-2023, 2540 D	100	10
17.	Nitrate (as NO_3) in mg/l	APHA 24th Edition-2023, 4500 NO_3^- E	10	<0.5
18.	Sulphate (as SO_4) in mg/l	APHA 24th Edition-2023, 4500 SO_4 E	--	9.4
19.	Phenolic Compounds (as C_6H_5OH) in mg/l	APHA 24th Edition-2023, 5530C	1.0	<0.001
20.	Cyanide (as Cn) in mg/l	IS 3025 (Part 27): 1986(RA 2014)	0.2	<0.02
21.	Iron (as Fe) in mg/l	IS 3025 (Part 53): 1988(RA 2019)	3.0	0.12
22.	Total Hardness (as $CaCO_3$) in mg/l	IS 3025 (Part 21): 2009 (RA 2019)	--	49.9
23.	Dissolved Oxygen (as DO) in mg/l	APHA 24th Edition-2023, 4500-O-C	--	6.3
24.	Silver (as Ag) in mg/l	APHA 24th Edition-2023, 3111B	----	<0.1

Report Prepared By:

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

-------End of Report--------

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Qualissure Laboratory Services
361, Prantick Pally, 45/361, Bose Pukur Road, Kolkata -700107
Email : qualissure@gmail.com; info@qualissure.com ; Mob.No. 98312 87086 ; 9830093976
TC-6271

DOC NO : QLS/SAMP/08-E/00

TEST REPORT

Name & Address Of the Customer :		
M/s. GNS Builders 32 no. Martam Landfill, Gangtok, Sikkim-737101	Report No. Date Sample No. Sample Description Sample Mark Date of Performance(s) Sample Collected On Ref No. Date	: QLS/MR/S/24-25/C/07 : 10.06.2024 : QLS/MR/S/24-25/07 : Soil : Good Earth : 04.06.2024-10.06.2024 : 02.06.2024 : Verbal Confirmation

Analysis Result

Sl.No.	Test Parameter	Test Method	Specification of City Compost as per FCO	Result
1.	pH at 25°C	IS 2720 (Part 26): 1987(RA 2011)	6.5-7.5	7.29
2.	Conductivity in mmhos/cm	IS 14767 :2000, RA 2016	4.0(Max)	2.18
3.	Bulk density in g/cc	IS 2720 (Part -29) 1975 RA 2005	<1	0.94
4.	Moisture Content in %	IS: 2720 (Part 2) 1973 (RA 2015)	15-25	15.7
5.	Total Phosphorus (as P_2O_5, % by weight)	SOP No. TPM/QLS/E/S/P based on Methods of Soil Analysis (Soil Science society for America) Part II, pg1040-1041	0.4(Min)	0.43
6.	Total Potassium (as K_2O, % by weight)	Soil Analysis (Soil Science society for America) Part II	0.4(Min)	0.46
7.	TOC % by weight	SOP No. TPM/QLS/E/S/OC based on Methods of Soil Analysis (Soil Science society for America) Part II, pg1370	12.0(Min)	14.9
8.	Total Nitrogen (as N) % by weight	IS 14684 (1999) RA 2014	0.8(Min)	0.84
9.	Copper (as Cu), mg/kg	EPA 3050 B: December, 1996, EPA 7000 B: February 2007	300.0(Max)	134.2
10.	Zinc (as Zn), mg/kg	EPA 3050 B: December, 1996, EPA 7000 B: February 2007	1000.0(Max)	386.7
11.	Mercury (as Hg), mg/kg	USEPA 245.5 - 1974	0.15(Max)	<0.1
12.	Cadmium (as Cd), mg/kg	EPA 3050 B- December, 1996, EPA 7000 B- February, 2007	5.0(Max)	0.47
13.	Nickel (as Ni), mg/kg	EPA 3050 B- December, 1996, EPA 7000 B- February, 2007	50.0(Max)	18.3
14.	Chromium (as Cr), mg/kg	EPA 3050 B- December, 1996, EPA 7000 B- February, 2007	50.0(Max)	33.8
15.	Lead (as Pb), mg/kg	EPA 3050 B- December, 1996, EPA 7000 B- February, 2007	100.0(Max)	20.6
16.	Arsenic (as As_2O_3), mg/kg	EPA 3050 B - December, 1996, VGA	10.0(Max)	<0.25

Report Prepared By:

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

-------End of Report--------

Qualissure Laboratory Services
NABL ACCREDITED, WBPCB & ISO 9001:2015 CERTIFIED LABORATORY

361, Prantick Pally,
45/361, Bose Pukur Road,
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Mob. No. : 9831287086
9830093976

DOC NO : QLS/SAMP/08-E/00

TEST REPORT

Name & Address Of the Customer : M/s. GNS Builders 32 no. Martam Landfill, Gangtok, Sikkim-737101	Report No. : QLS/MR/S/24-25/C/07A Date : 10.06.2024 Sample No. : QLS/MR/S/24-25/07 Sample Description : Soil Sample Mark : Good Earth Date of Performance(s) : 04.06.2024-10.06.2024 Sample Collected On : 02.06.2024 Ref No. Date : Verbal Confirmation

Analysis Result

Sl.No.	Test Parameter	Test Method	Specification of City Compost as per FCO	Result
1.	Particle Size (pass through 4.0mm IS Sieve) in % by mass	**As Per FCO norms (1985)**	90% Pass through 4.0mm IS Sieve	95
2.	C:N Ratio	**As Per FCO norms (1985)**	<20.0	17.7

Report Prepared By:

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

-------End of Report--------

Qualissure Laboratory Services
NABL ACCREDITED, WBPCB & ISO 9001:2015 CERTIFIED LABORATORY

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Mob. No. : 9831287086
9830093976

DOC NO : QLS/SAMP/08-E/00

TEST REPORT

Name & Address Of the Customer:		
M/s. GNS Builders 32 no. Martam Landfill Gangtok, Sikkim-737101	Report No.	: QLS/MR/S/24-25/C/22
	Date	: 18.05.2024
	Sample No.	: QLS/MR/S/24-25/22
	Sample Description	: Refuse Derived Fuel (RDF)
	Sample Location/Mark	: Refuse Derived Fuel (RDF)
	Period Of Analysis	: 14.05.2024-17.05.2024
	Sample Submitted On	: 13.05.2024
	Ref No. Date	: Verbal Confirmation

Analysis Result

(A) Physical Characteristics

Sl.No.	Test Parameter	Test Method	Result
1.	Plastic Percentage	IS 2386 (Part 1)-1963	82.4

(B) Chemical Characteristics

Sl. No.	Test Parameter	Result	RDF Standards as per Guidelines on Usage of RDF published by MoHUA			Test Method
			RDF Grade-III	RDF Grade-II	RDF Grade-I	
1	Moisture at 105°C in %	17.6	<20%	<15%	<10%	IS 1350 (P-1) :1984
2	Gross Calorific Value (GCV) in Kcal/kg	3253	>3000 Kcal/kg	>3750 Kcal/kg	>4500 Kcal/kg	IS 1350 (P-2) :1975
3.	Net Calorific Value (NCV) in Kcal/kg	2663	--	--	--	IS 1350 (P-2) :1975
3	Ash Content at 805°C in %	21.4	<15%	<10%	<10%	IS 1350 (P-1) 1984
4	Volatile Matter in %	29.8	--	--	--	IS 1350 (P-1) 1984
5	Chlorine in %	0.79	<1.0%	<0.7%	<0.5%	USEPA SW 846 Method 9253-1994

Report Prepared By:

for Qualissure Laboratory Services
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

-------End of Report--------

TEST REPORT

Name & Address of the Customer		
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report No.	: MSK/GHY/2024-25/00360
	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: ZONE 1, ETP WATER
	Sample Submitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01576
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Chemical Analysis Result

Sl. No.	Parameter	Unit	Limit	Result	Test Method
1.	pH value	None	6.0-8.5	6.93 at 25 Deg C	APHA 24th Edition, 2023 4500-H+B
2.	Total Suspended Solids (as TSS)	mg/l	20.0	55	APHA (24th Edition),2540D
3.	Biochemical Oxygen Demand (as BOD)	mg/l	30	14	APHA (24th Edition), 5210B
4.	Chemical Oxygen Demand (as COD)	mg/l	250	46	APHA (24th Edition), 5220B

Report Prepared By:

Mitra S. K. Private Limited

Authorized Signatory

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TEST REPORT

Name & Address of the Customer		
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report No.	: MSK/GHY/2024-25/00360
	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: ZONE 1, ETP WATER
	Sample Submitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01576
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Microbiological Analysis Result

Sl. No.	Test Parameters	Unit	Method	Result
1.	Faecal coliform	MPN/100ml	IS 1622 : 1981 (RA 2019)	<2

Report Prepared By:

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TEST REPORT

Name & Address of the Customer	Report No.	: MSK/GHY/2024-25/00361
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: ZONE 2, ETP WATER
	Sample Submitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01633
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Chemical Analysis Result

Sl. No.	Parameter	Unit	Limit	Result	Test Method
1.	pH value	None	6.0-8.5	7.21at 25 Deg C	APHA 24th Edition, 2023 4500-H+B
2.	Total Dissolved Solids (as TDS)	mg/l	20.0	47	APHA (24th Edition),2540D
3.	Biochemical Oxygen Demand (as BOD)	mg/l	30	11	APHA (24th Edition), 5210B
4.	Chemical Oxygen Demand (as COD)	mg/l	250	38	APHA (24th Edition), 5220B

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TEST REPORT

Name & Address of the Customer		
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report No.	: MSK/GHY/2024-25/00361
	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: ZONE 2, ETP WATER
	Sample Submitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01633
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Microbiological Analysis Result

Sl. No.	Test Parameters	Unit	Method	Result
1.	Faecal coliform	MPN/100ml	IS 1622 : 1981 (RA 2019)	<2

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TEST REPORT

Name & Address of the Customer	Report No.	: MSK/GHY/2024-25/00362
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: ZONE 3, ETP WATER
	SampleSubmitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01634
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Chemical Analysis Result

Sl. No.	Parameter	Unit	Limit	Result	Test Method
1.	pH value	None	6.0-8.5	7.28at 25 Deg C	APHA 24th Edition, 2023 4500-H+B
2.	Total Suspended Solids (as TSS)	mg/l	20.0	49	APHA (24th Edition),2540D
3.	Biochemical Oxygen Demand (as BOD)	mg/l	30	9.3	APHA (24th Edition), 5210B
4.	Chemical Oxygen Demand (as COD)	mg/l	250	33	APHA (24th Edition), 5220B

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TEST REPORT

Name & Address of the Customer	Report No.	: MSK/GHY/2024-25/00362
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: ZONE 3, STP WATER
	Sample Submitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01634
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Microbiological Analysis Result

Sl. No.	Test Parameters	Unit	Method	Result
1.	Faecal coliform	MPN/100ml	IS 1622 : 1981 (RA 2019)	<2

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Name & Address of the Customer		
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report No.	: MSK/GHY/2024-25/00363
	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: ZONE 4, ETP WATER
	SampleSubmitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01635
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Chemical Analysis Result

Sl. No.	Parameter	Unit	Limit	Result	Test Method
1.	pH value	None	6.0-8.5	6.89at 25 Deg C	APHA 24th Edition, 2023 4500-H+B
2.	Total Suspended Solids (as TSS)	mg/l	20.0	53	APHA (24th Edition),2540D
3.	Biochemical Oxygen Demand (as BOD)	mg/l	30	7.8	APHA (24th Edition), 5210B
4.	Chemical Oxygen Demand (as COD)	mg/l	250	32	APHA (24th Edition), 5220B

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Name & Address of the Customer	Report No.	: MSK/GHY/2024-25/00363
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report Date	: 03.06.2024
	Nature of Sample	*: Effluent Water*
	Sample Mark	: ZONE 4, STP WATER
	Sample Submitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01635
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Microbiological Analysis Result

Sl. No.	Test Parameters	Unit	Method	Result
1.	Faecal coliform	MPN/100ml	IS 1622 : 1981 (RA 2019)	<2

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TEST REPORT

Name & Address of the Customer	Report No.	: MSK/GHY/2024-25/00362
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: RANIPOOL STP
	SampleSubmitted On	: 24.05.2024
	Sample Number	: MSKGL/ED/2024-25/05/01634
Reference No.& Date: LOOSE/SE/SEW/PHED/51, Date : 15.05.2024		

Chemical Analysis Result

Sl. No.	Parameter	Unit	Limit	Result	Test Method
1.	pH value	None	6.0-8.5	7.28at 25 Deg C	APHA 24th Edition, 2023 4500-H+B
2.	Total Suspended Solids (as TSS)	mg/l	20.0	49	APHA (24th Edition),2540D
3.	Biochemical Oxygen Demand (as BOD)	mg/l	30	9.3	APHA (24th Edition), 5210B
4.	Chemical Oxygen Demand (as COD)	mg/l	250	33	APHA (24th Edition), 5220B

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Name & Address of the Customer		
"PHED, Govt of Sikkim" Public Health Engineering Department, Government of Sikkim, Nirman Bhawan, Gangtok, Sikkim, Pin-737101	Report No.	: MSK/GHY/2024-25/00362
	Report Date	: 03.06.2024
	Nature of Sample	: Effluent Water
	Sample Mark	: RANIPOOL STP
	Sample Submitted On	: 24.05.2024
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Microbiological Analysis Result

Sl. No.	Test Parameters	Unit	Method	Result
1.	Faecal coliform	MPN/100ml	IS 1622 : 1981 (RA 2019)	<2

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625

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

MITRA S.K. PRIVATE LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

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

for its facilities at

BUILDING NO. P-48,UDAYAN INDUSTRIAL ESTATE,3, PAGLADANGA ROAD, KOLKATA, WEST BENGAL, INDIA

in the field of

TESTING

Certificate Number: TC-6950

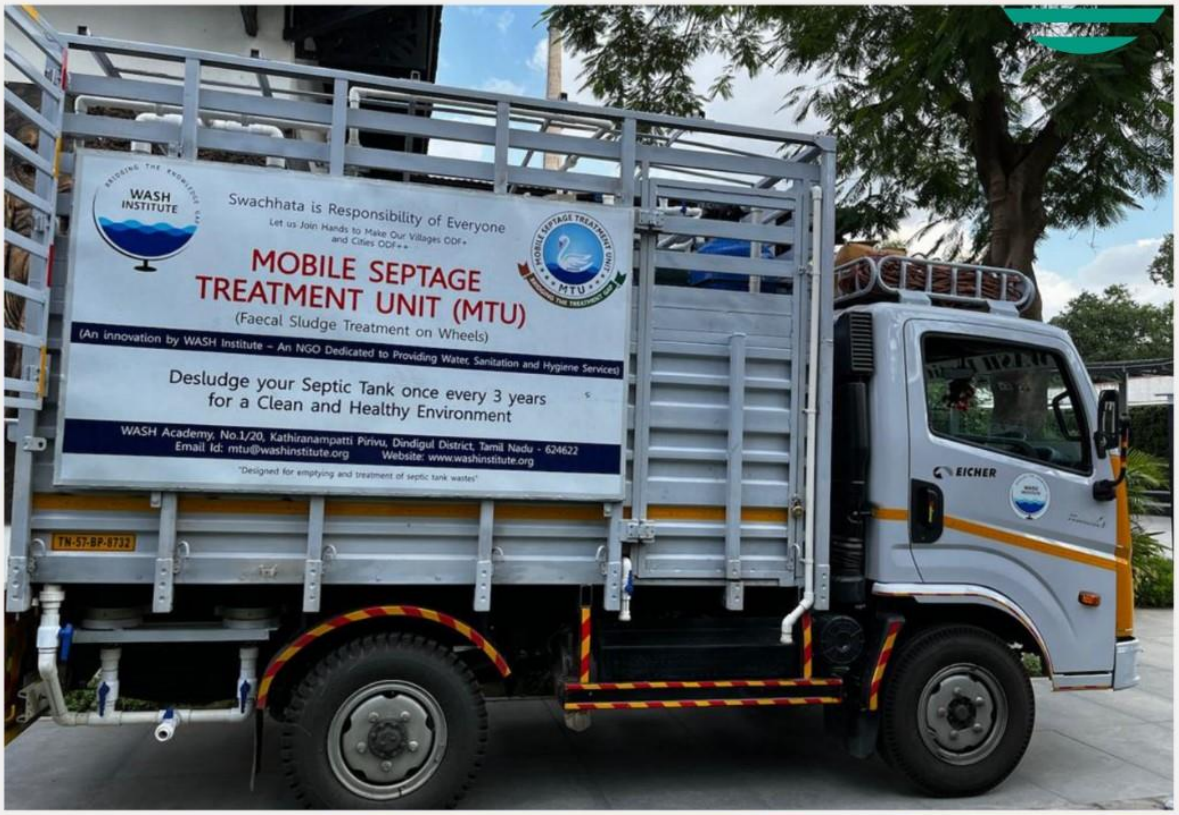
Issue Date: 18/09/2023 **Valid Until:** 17/09/2025

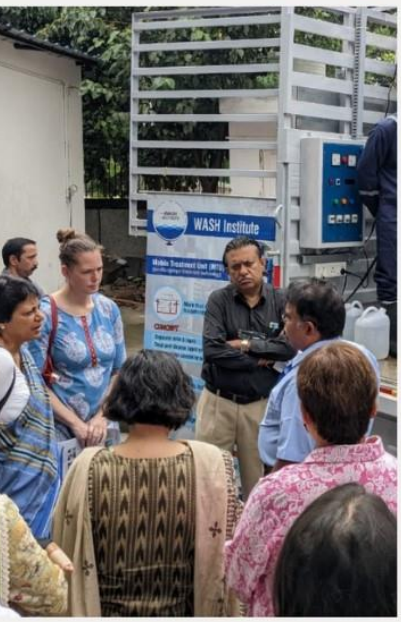
This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

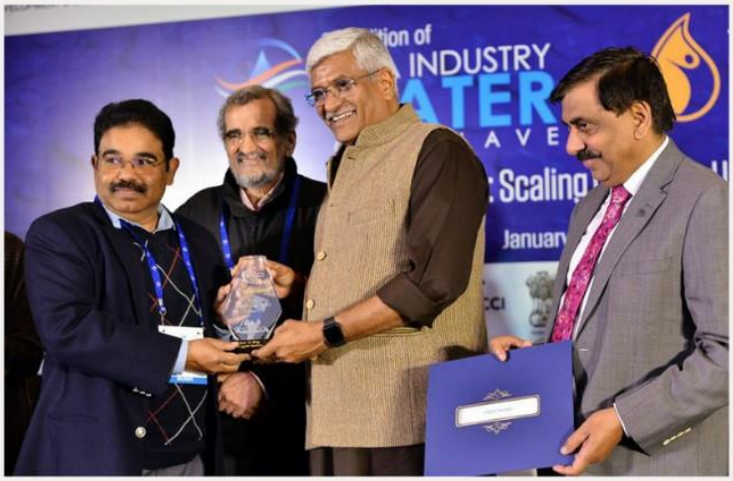
Name of Legal Entity: MITRA S.K. PRIVATE LIMITED

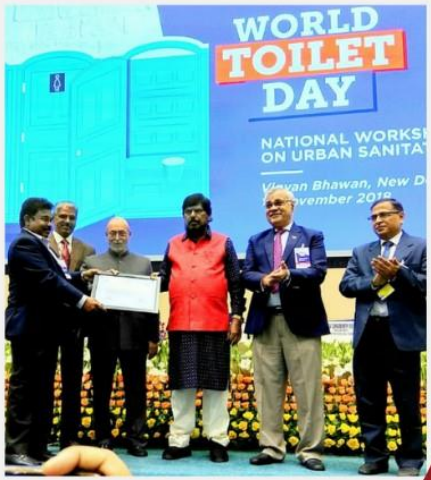
Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer









Technical Specifications
Mobile septage Treatment Unit (MTU)

WASH Institute

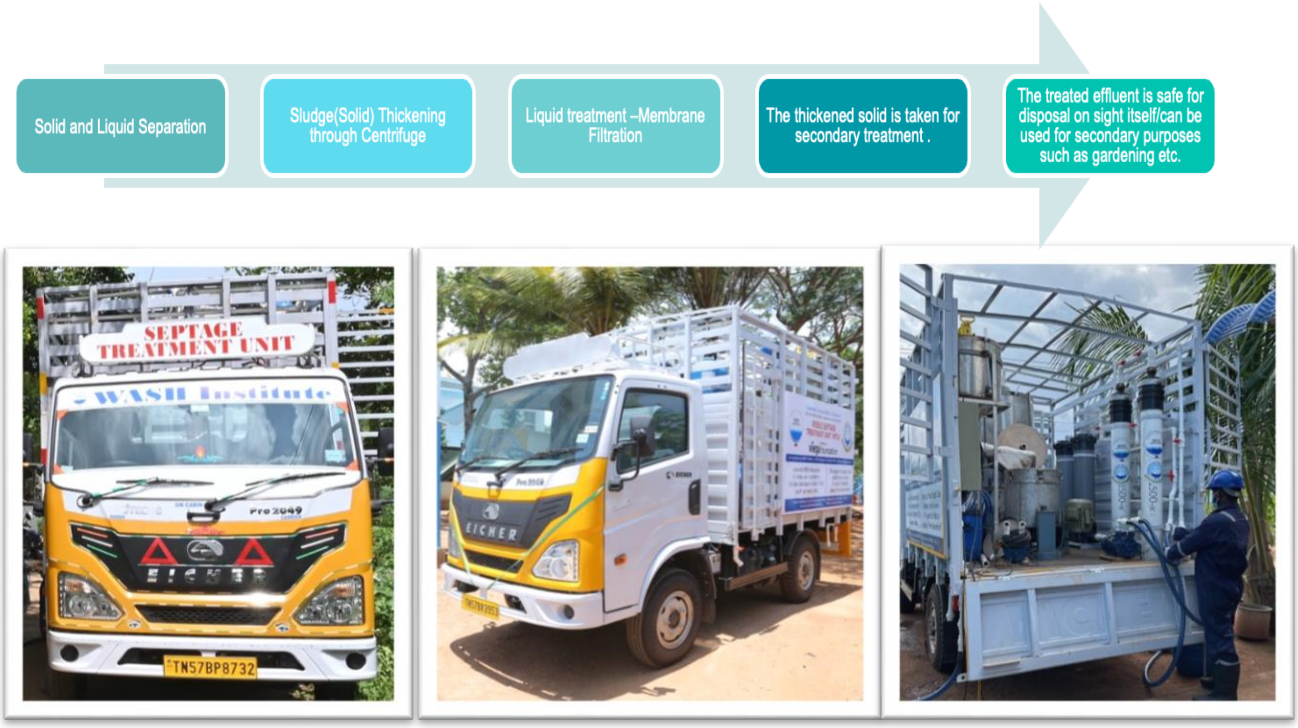
Introduction to Mobile septage Treatment Unit (MTU)

Mobile septage Treatment Unit (MTU) is an onsite septage treatment technology developed by Water, Sanitation and Hygiene Institute (WASH Institute). MTU is a treatment system installed on a truck, which can treat the contents (septage) of septic tanks.

In general, septage consists of higher volume of liquid and most of the cesspool truck operators carry the entire septage (solid & liquid) to the treatment/disposal sites. But the MTU separates solid from liquid, which passes through a series of filters and the treated effluent is disposed on the site safely (kitchen garden/ Open drain). Further, the separated solids are thickened in the MTU by removing the moisture content in a centrifuge, and retained for secondary treatment at the end of the day.

The retained solids, which constitute less than 1% of total volume of the treated septage, may be co-composted along with biodegradable household solid waste or briquetted and used as an alternative for charcoal. In absence of these options, it can be safely buried in a shallow pit. The MTU is designed to treat 6000 litres of septage per hour. MTU can treat 2-3 septic tanks in a day.

Refer the process flow diagram below:



Applicability of MTU

MTU is designed for emptying and on-site treatment of septage from household septic tanks only.

Technology vetting and Approval

1. Technical Committee, chaired by the Principal Scientific Adviser, Government of India has vetted and approved the MTU vide letter number W-11015/11/2022-JJM-VI-DDWS dated 4th August 2023 (Approval letter is linked here). MTU is listed on Jal Jeevan Mission website under PSA approved technologies.

2. Technical Committee constituted by Ministry of Housing and Urban Affairs (MoHUA) vetted the MTU under their Global Technology Challenge (4th July 2018 to 14th August 2018) and issued a DO letter to the states and ULBs advising them to use MTUs as one of the options for emptying and treating septage (DO letter can be accessed here).
3. The MTU is in the process of being listed on the GeM Portal as part of Ministry of Jal Shakti approved Technologies for Sanitation.
4. In 2022, MTU was included under Swachh Bharat Kosh (SBK) by Department of Drinking Water and Sanitation, Ministry of Jal Shakti in SBM G (Refer the link here).

Evaluations carried out

MTU has gone through several technical validations notably by National and International organization of repute.

1. Scientists from Duke University, Durham, USA carried out field testing & evaluation study of MTU in India in 2018 and validated the performance of MTU.

2. Scientists from BITS Pilani, Goa, field tested MTU in 2021 and certified its performance to meet the prescribed effluent discharge standards of Government of India. The certification process was reviewed and the certification was endorsed by Scientists from IIT-Chennai and NIT-Suratkal.

Technical Specifications of Major Components of MTU

Sl. No.	Component/ Sub-assemblies	Parameter	Rating/Value/Size
1.	Vehicle	Make and Model	Eicher Pro 2049
		Payload capacity	3500 Kgs
		Wheelbase	3370 mm
		Length and Width	3691 mm and 2002 mm
		Body option and cabin type	Chassis with Cabin
		Height of vehicle	As per RTO norms
2.	Screen Filter	Filter	Jain Super Flow Filter 230691 Mesh size - 120mesh
		Flow and Pressure	Nominal flow - 25 m3/h Pressure - 1.5 Kg/cm2
		Purpose of Screen Filter	Solid liquid separation at first stage
3.	Conical tank	MOC/Thk	SS 304/2mm
		Volumetric Capacity	150-200 (depend on the capacity)
		Purpose of conical storage tank	First stage of effluent before filtration
		Four Pathways	1. From Pre-screen filter- Inlet from septic tank 2. From Centrifuge Storage Tank- For storage purpose 3. Back wash / Return Line from UF (Ultra Fine) Filters 4. Return line from sand fitter
		Electric Motor	• Power: 1 to 2 Hp • Flow from conical tank: 20 to 80 LPM

			• Purpose of Electric Motor: To pump out water from conical-storage tank to filter assembly
4.	Coagulation Tank	MOC/Thk	SS 304/2mm
		Volumetric Capacity	70 to 100 litres
		Dosing unit	Capacity- 15 to 25 kg
			Submersible polymer dosage pump (Flow- 2500 to 4500 LPH)
			Polymer – Polyacrylamide Cationic Floccultant
		Stirrer	Location- Top side of coagulation tank
			Stirrer motor 220 v
			Purpose of Stirrer – Mixing the effluent and polymer
5.	Centrifuge storage tank	MOC/Thk	SS 304/ 2mm
		Purpose of two compartments	1. Storing the effluent 2. Liquid Chlorine storage for chlorination
		Volumetric Capacity	60 to 80 litres
		Electric motor	Power – 1 to 1.5 Hp 220 V Single phase
6.	Storage Tank	Volumetric Capacity	60 to 80 litres
7.	Power Source	Alternator	Suitable to drive electric motors
8.	Septage/Sludge Pumps	Submersible	Make: Crompton Model: STPG052(1PH)-7 HP: 0.5
		Electric Motor/pump 2Nos	Make: Kirloskar; 1.5 HP And Make: Crompton; 1 HP
Filtration Stages			
1.	Sand Filter	Dia / Height	Dia: - 300 to 400 mm / Height:- 800 to 1200 mm
		MOC	FRP (Fibre Reinforced Polycarbonate) Vessel.
		Internal Filtration Material	Pebbles, Coarse Sand, Activated carbon
		Multiport valve	Three Operating Valves- Inlet, Outlet and Backwash
		Filter Motor pump	1 to 1.5 Hp
2.	Carbon Filter	Dia / Height	Dia: - 300 to 400 mm / Height: - 800 to 1200 mm
		Internal Filtration Material	Activated carbon filter
		Multiport valve	Three Operating Valves- Inlet, Outlet and Backwash
3.	Micron Filter	10 Micron filter	Dia- 180 to 230 mm
		1 Micron filter	Dia- 180 to 230 mm
4.	Ultra Filter	1st Ultra filter	Dia- 150 to 190 mm
		2nd Ultra filter	Dia- 150 to 190 mm

Note: Wherever brand name is mentioned in any of the component specifications, equivalent alternative may also be used.