UWR Rainwater Offset Unit Standard

(UWR RoU Standard)

Concept & Design: Universal Water Registry

www.uwaterregistry.io

Project Concept Note & Monitoring Report

(PCNMR)

Project Name: Wastewater Reclamation Project by Exim Knits Private Limited

UWR RoU Scope:5
Monitoring Period: 01/01/2021-31/12/2024
Crediting Period: 2021-2040
UNDP Human Development Indicator:0.64(India)
RoUs Generated During 1st Monitoring Period: 627,274

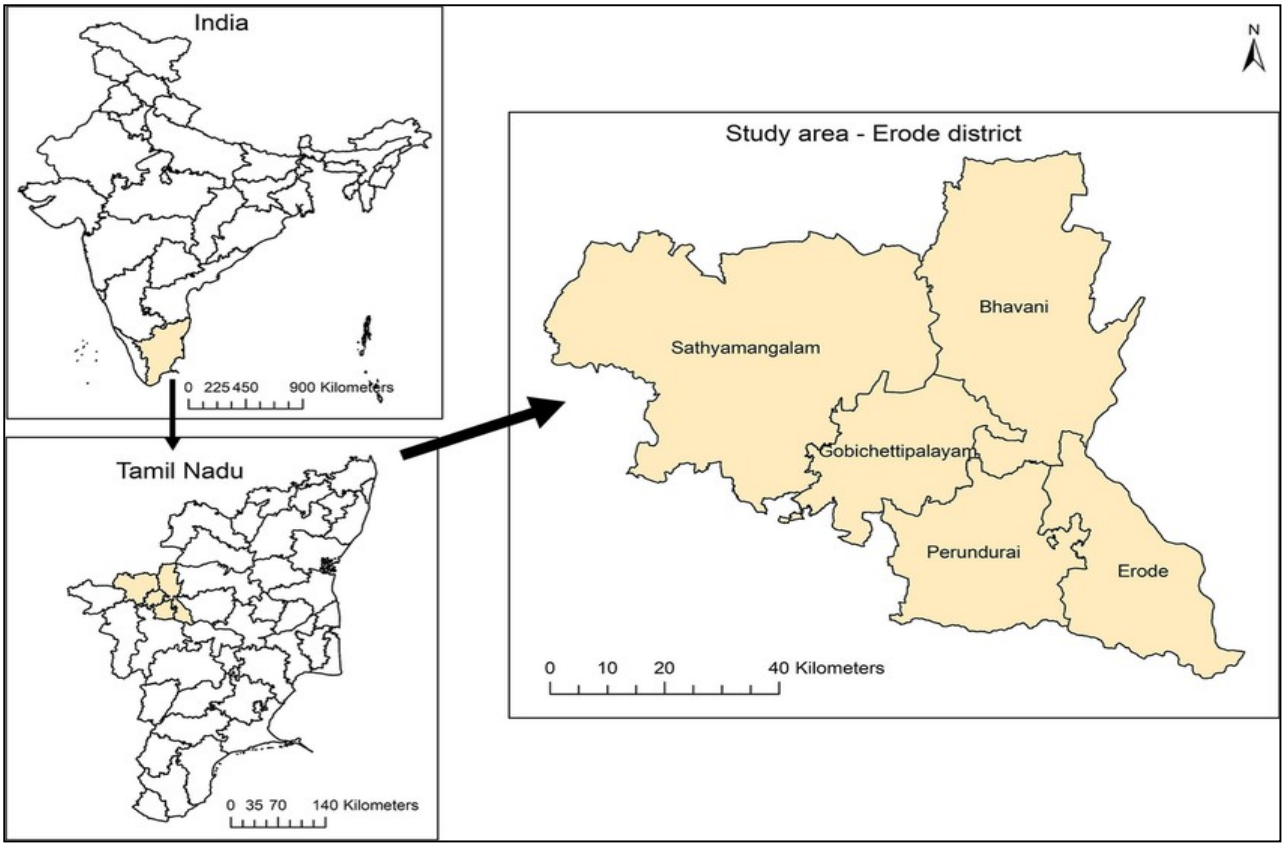
A.1 Location of Project Activity

State	Tamil Nadu
District	Erode
Block Basin/Sub Basin/Watershed	http://cgwb.gov.in/watershed/basinsindia.html Bhavani
Lat. & Longitude	11.237734° Long 77.552444°
Area Extent	SF. NO – 99(Pt), 100(Pt), 101(Pt), 102(Pt), 107(Pt), 120(Pt) & Plot No's. E-5A, E-5B, F-20, F21& G9 SIPCOT Industrial Growth Centre Perundurai - 638052
No. of Villages/Towns	Perundurai

Satellite view of Exim Knit Pvt Ltd

Primary Units

Secondary Units



Project activity

Purpose of the project activity:

M/s. Exim Knits Private limited has been designed to meet the fabric requirements of its group concerns. This would contribute around 50% of the proposed capacity and the remaining will be utilized for job work to other exporters. They started with dyeing and finishing fabrics and are now planning to expand into fabric printing. Their facility, located in the SIPCOT Industrial Growth Centre in Perundurai, began operations on March 1st, 2021. It has the capacity to treat 2.28 million Liters per Day (MLD) of wastewater, though currently, it treats about 1.18 MLD. Before, their wastewater treatment plant (ETP) used a simple chemical process with lime and ferrous sulphate, which created sludge. The treated water was then reused in the Dying Process. However, the company has since planned and received approval for a **Zero Liquid Discharge (ZLD)** system. This means they intend to stop releasing any treated wastewater into the river basin and instead recover and reuse all the water.

Exim Knits Private Limited's wastewater treatment strategy focuses on significant water recovery and responsible waste disposal. The company recycles a substantial volume of treated water, specifically 1112.0 KLD and an additional 60.0 KLD, back into its textile processes, including dyeing and printing, indicating effective utilization of water recovered from its Reverse Osmosis (RO) and evaporator

systems. For the remaining highly concentrated waste, 7.30 KLD of MEE (Multi-Effect Evaporator) reject is sent to an ATFD (Agitated Thin Film Dryer) for final processing, converting it into a solid form, which aligns with their Zero Liquid Discharge (ZLD) goal for solid waste disposal. Furthermore, domestic sewage, amounting to 22.50 KLD, is managed separately and disposed of on land for gardening purposes.

A.2. Project owner information, key roles and responsibilities

Project Proponent (PP):	Exim Knits Private Limited
UCR Project Aggregator	Viviid Emissions Reductions Universal Private Limited
Contact Information:	lokesh.jain@viviidgreen.com

The Project Proponent (PP) affirms that they meet all the requirements outlined in the management plan regarding ownership, legal rights, permits, and cost details for the successful implementation of the project. Specifically.

Water User Rights: The PP holds the necessary water user rights for the area within the project's boundary. These rights are legally secured and ensure that the PP has full entitlement to use the water resources required for the project's operations.

Legal Land Title: The PP holds an uncontested legal land title for the entire project area within the project's boundary. The title is fully documented and free of any disputes, confirming the PP's legal right to utilize the land for project purposes.

Necessary Permits: The PP has obtained all the required permits for the implementation of the project. In cases where certain permits are pending, the PP has already applied for the necessary approval and is working in full compliance with the relevant regulatory requirements to ensure the timely commencement of the project.

Cost Details: The PP has thoroughly assessed and documented the cost details for project implementation. A detailed cost breakdown is available in the DPR, Capital Cost of project was Rs 6 Crores. covering all aspects of project development, including infrastructure, permits, equipment, and operational costs.

By meeting these criteria, the PP ensures that all legal and regulatory requirements for the project are satisfied, enabling the project to proceed without hindrance.

A.2.1 Project RoU Scope

PROJECT NAME	Wastewater Reclamation Project by Exim Knits Private Limited
UWR Scope:	Scope 5: Conservation measures taken to recycle and/or reuse water, spent washing wastewater etc. across or within specific industrial processes and systems, including wastewater recycled/ reused in a different process, but within the same site or location of the project activity. Recycled wastewater used in off-site landscaping, gardening or tree plantations/forests activity are also eligible under this Scope.
Date PCNMR Prepared	20-06-2025

A.3. Land use and Drainage Pattern

Not Applicable.

This project involves treating and reusing wastewater. It doesn't include any land-use practices. Also, this is an industrial process designed with technical requirements and following the specified norms of the local pollution control board. Hence, the project activity does not harm any land and Drainage system**.**

A.4. Climate

The project activity does not rely on the climatic conditions of the area as it treats and reuses only the wastewater from the dying & textile without letting the water be exposed to any climatic condition.

A.5. Rainfall

The project activity is not dependent on the rainfall pattern of the area as it treats and reuses the wastewater from the dying Industry.

A.6. Ground Water

The project activity does not rely on groundwater, as the treated effluent is reused in the process.

A.7. Alternate methods

All Textile Plant in Tamil Nadu, They have a mandate to maintain the TDS below 1500 mg/L from the state government; however, they have installed Mechanical Evaporation (MEE), which serve as alternative solutions for the Effluent Treatment Plant (ETP). RO is used to remove dissolved solids, and MEE helps in evaporating water to concentrate the dissolved salts. These systems are designed to reduce the TDS levels in the effluent.

Despite the installation of RO and MEE systems, the TDS level in the treated effluent remains much higher than the standards set by the Pollution Control Board (PCB). As a result, the PP has installed a Zero Liquid Discharge (ZLD) system as an alternative method to ensure compliance with the regulatory requirements. The ZLD system helps in eliminating the discharge of liquid waste by treating all effluent and recovering water for reuse, thus effectively reducing the TDS concentration and achieving the desired standards.

The RoU program promotes wastewater treatment and reuse initiatives, thereby offering an alternative to the release of wastewater through surface Discharge which could have an adverse impact on soil Health.

A.8. Design Specifications

Overview of Effluent Streams:

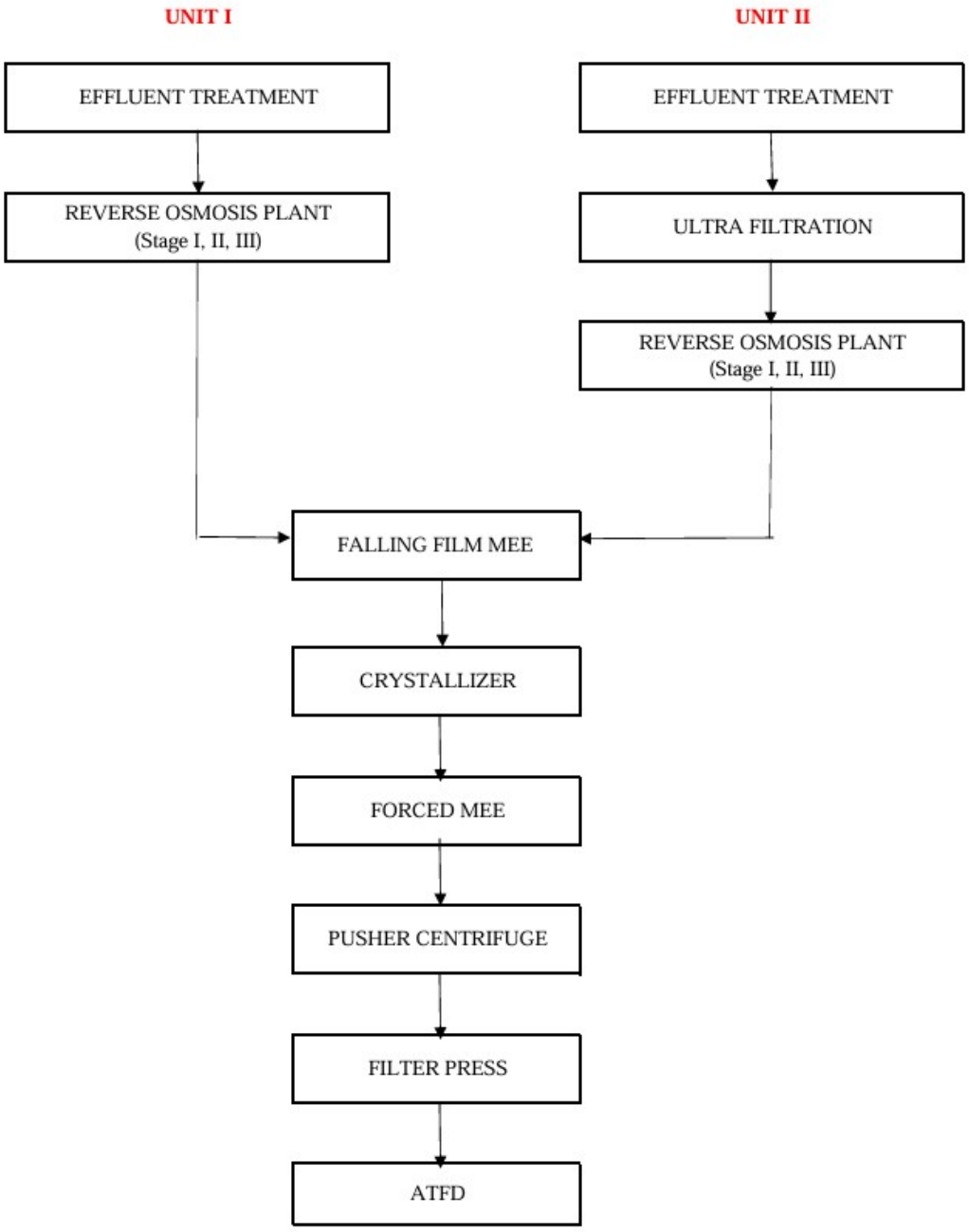
- Dyeing, Bleaching, Washing & Finishing Effluent: 1124 KLD.
- Printing Effluent: 60 KLD.
- Domestic Sewage: 23.0 KLD. (Disposed on land for gardening).

Total Trade Effluent to be Treated: 1184 KLD (1124 KLD Dyeing + 60 KLD Printing)

(Dyeing & Printing with ZLD)

The company has two main ETP plants (Plant I and Plant II for Dyeing, Bleaching & Washing) and a separate plant for Printing Effluent Treatment. The ZLD scheme is noted to have received approval.

DETAILS OF TREATMENT SCHEME



A. Printing Effluent Treatment Plant (60 KLD):

The wastewater treatment process for the printing operations at Exim Knits Private Limited begins with the initial collection and equalization of effluent in dedicated tanks to stabilize flow and concentration. Subsequently, a chemical coagulation/flocculation step is employed, involving the addition of lime at 700 ppm and ferrous sulphate at 300 ppm to the printing effluent, which effectively aids in color removal and reduction of suspended solids (TSS of 500 mg/L). Following this, the wastewater undergoes clarification, a process that results in the formation of chemical sludge from the settled matter. A degasification tank is also integrated into the printing ETP, likely for the removal of dissolved gases, before the treated water is directed to a storage tank, presumably for reuse within the printing line. For chemical sludge management, approximately 90 Kgs/day of dry sludge is generated, which, at a consistency of 2.5% from the clarifier, translates to a volume of 3600 liters per day. This wet sludge is then efficiently dewatered using a filter press, sized at 66 plates of 915mm x 915mm, achieving a consistency of 30%. Each batch from the filter press yields 2560 liters of dewatered cake volume, and operating three batches per day provides an available volume of 7680 liters, significantly exceeding the required 3600 liters. The dewatered sludge is temporarily stored in a designated shed.

Dyeing, Bleaching & Washing Effluent Treatment Plant - I (Earlier setup/partial flow):

This section details the operation of ETP Plant I, which primarily focuses on advanced purification through multiple Reverse Osmosis (RO) stages, suggesting it handles a portion of the dyeing effluent after initial treatment. The process begins with a Collection cum Equalization Tank for receiving and homogenizing the wastewater, followed by a Primary Clarifier for initial solid settling. Subsequently, the effluent undergoes biological treatment in an Aeration Tank and Secondary Clarifier to reduce organic pollutants (BOD) before being temporarily stored in an Intermediate Tank prior to the RO system.

The core of this plant's purification lies in its sequential Reverse Osmosis (RO) stages, fed from dedicated RO Feed Tanks. Reverse Osmosis is a membrane-based technology that uses pressure to force water molecules through a semi-permeable membrane, leaving dissolved salts and other impurities behind. This process effectively separates clean water (permeate) from a concentrated waste stream (reject). In this plant:

- RO Stage I, equipped with 18 Brackish 8" Membranes, receives a feed of 274 KLD, achieving a 65% recovery rate to produce 178.10 KLD of permeate, with 95.90 KLD as reject.
- The reject from Stage I then feeds RO Stage II, which utilizes 12 Sea Water 8" Membranes. This stage processes 95.90 KLD, recovering 50% (47.95 KLD) as permeate and generating 47.95 KLD of reject.
- Finally, RO Stage III, with 8 Sea Water 8" Membranes, treats the 47.95 KLD reject from Stage II, achieving a 35% recovery (16.78 KLD permeate) and producing 31.17 KLD of highly concentrated reject. The combined treated water from these RO stages is then collected in the RO Permeate Tank, ready for reuse.

RO-Plant I

SL no	Membrane Process	No. of Membrane	Feed m3/day	Recovery m3/day	Recovery Percentage (%)	Reject m3/day	Status of functioning
1	RO Stage – I	Brackish 8" Membrane – 18 No's	274.0	178.10	65.00	95.90	Installed capacity: 360 KLD & its Adequate
2	RO Stage – II	Sea Water 8" Membrane – 12 No's	95.90	47.95	50.00	47.95	Installed capacity: 240 KLD & its Adequate
3	RO Stage – III	Sea Water 8" Membrane – 8 No's	47.95	16.78	35.00	31.17	Installed capacity: 160 KLD & its Adequate

RO stage -I unit

RO-Plant II

SL no	Membrane process	No. of membrane	Feed m3/day	Recovery m3/day	Recovery Percentage (%)	Reject m3/day	Status of functioning
1A	RO I Stage - A	Brackish 8" Membrane - 48 No's	850.00	552.50	65.00	297.50	Installed capacity: 1920 KLD & its Adequate
1B	RO I Stage - B	Brackish 8" – Membrane - 48 No's					
2	RO II Stage	Sea Water 8" Membrane - 36 No's	297.50	148.75	50.00	148.75	Installed capacity: 720 KLD & its Adequate
3	RO III Stage	Sea Water 8" Membrane - 8 No's	148.75	52.06	35.00	96.69	Installed capacity: 160 KLD & its Adequate

Ro stage II- unit

Dyeing, Bleaching & Washing Effluent Treatment Plant - II (Main ETP with ZLD):

ETP Plant II represents the larger and more comprehensive Zero Liquid Discharge (ZLD) system dedicated to the dyeing, bleaching, and washing processes, managing an effluent volume of 1124 KLD. Its treatment sequence begins with initial collection and homogenization in a dedicated tank, followed by biological treatment in an Aeration Tank and Secondary Clarifier, which effectively reduces BOD by 150 ppm (equivalent to 168.6 Kg/day) and results in the generation of 84.30 Kgs of biological sludge on a dry weight basis. Following an Intermediate Tank and Tertiary Clarifier, the process integrates advanced membrane technologies, starting with Ultrafiltration (UF) as a crucial pre-treatment to protect the subsequent Reverse Osmosis (RO) membranes. The RO system itself comprises multiple stages (RO I A, RO I B, RO II, and RO III), designed to progressively remove dissolved solids and achieve a remarkable overall water recovery of 88.62% from the initial RO feed, with the high-quality treated water then collected in a RO Permeate Tank for reuse within the facility.

MEE-Forced Circulation- ATFD>>>> ZLD

This section details the critical reject management system designed to achieve Zero Liquid Discharge (ZLD) by further treating the concentrated RO reject, specifically the 96.69 KLD from RO Stage III of Plant II. The concentrated RO reject is initially stored in MEE Feed Tanks before being fed to a **Multiple Effect Evaporator (MEE)**, which is a 3-Effect Falling Film and 1-Effect Forced Circulation unit. This MEE processes a feed of 127.86 KLD, achieving an 85% water recovery (108.68 KLD as condensate) and generating 19.18 KLD of more concentrated reject. This MEE reject then proceeds to a **Forced Circulation Evaporator** (3-Effect type), which further concentrates the 19.18 KLD feed, recovering 80% (15.34 KLD as condensate) and leaving 3.836 KLD of highly concentrated reject. This highly concentrated stream is then transferred to a Crystallizer Feed Tank. The **Crystallizer**, a Single Effect - Cylindrical unit, receives a 19.18 KLD feed to solidify the salts, producing 2833 kg of Dried Salt. Finally, an **Agitated Thin Film Dryer (ATFD)**, with a capacity of 500 Kgs/Hr, processes the remaining 3.836 KLD input (likely residual slurry from the crystallizer or MEE reject), ensuring the production of a fully dry solid waste, thereby completing the ZLD process.

Multiple Effect Evaporator

Forced Circulation

The ETP has been installed to treat raw textile effluent on a Zero Liquid Discharge basis. The recovered water and salt are returned to the industries for reuse. There will be no liquid wastewater discharge to the outside environment.

Chemical Sludge Generation

Chemical Sludge for Printing (60 KLD)

Chemical sludge is generated in printing effluent treatment scheme is due to the settle matter in the clarifier after color removal. The total chemical sludge generated daily on a dry weight basis from both primary and tertiary treatment processes is calculated as the sum of added chemicals and total suspended solids in the effluent, amounting to 1012 Kgs/Day for the dyeing process and 90 Kgs/day for printing, resulting in a combined total of 1102 kg/day of dry sludge; it's important to note that actual sludge production may be lower as this figure is based on maximum pollutant loading.

Biological Sludge Generation:

BOD removed : 200 ppm inlet – 50 ppm outlet

: 150 ppm i.e. 168.6 Kg from 1124 KL Effluent

(Including ETP Return water)

Sludge generation is 50% of the BOD removal. Hence up to 84.30 Kgs on dry weight basis. This Sludge is diverted from the Secondary Clarifier to Sludge drying beds or Filter Press. After drying it's used as manure for plants.

Sludge Disposal:

The dried sludge is temporarily kept in Sludge storage shed under roofed shed without rainwater access. After getting the Consent from TNPC Board, the sludge will be disposed to Cement kiln Industries for Co-processing.

EQUIPMENT DETAILS:

S. No	Name of the Treatment Unit	No. of Units	Dimension
DYEING, BLEACHING & WASHING EFFLUENT TREATMENT PLANT - I			
1	Collection cum Equalization Tank	1	11.5m x 11.5m x 3.5m
2	Primary Clarifier	1	Dia 6.0Mtr X 3.60Ht
3	Aeration Tank	1	9.5m x 6.0m x 5.0m

4	Secondary Clarifier	1	Dia 6.0Mtr X 3.60Ht
5	Intermediate Tank	1	8.0m x 8.0m x 3.6m
6	RO I Feed Tank	1	8.0m x 8.0m x 3.6m
7	RO II Feed Tank	1	4.3m x 6.0m x 3.2m
8	RO III Feed Tank	1	4.3m x 6.0m x 3.2m
10	RO Permeate Tank	1	7.5m x 25.5m x 3.5m
11	RO Stage I		8" Membrane - 18Nos
12	RO Stage II		8" Membrane - 12Nos
13	RO Stage III		8" Membrane - 8 Nos
DYEING, BLEACHING & WASHING EFFLUENT TREATMENT PLANT - II			
14	Collection Tank	1	6.0m X 4.0m X 3.0m
15	Equalization Tank	1	27.0m X 6.0m X 6.50m
16	Aeration Tank	1	33.0m x 10.0m x 6.5m
17	Secondary Clarifier	1	Dia 12.0Mtr X 3.30Ht
18	Intermediate Tank	1	12.0m x 5.0m x 3.0m
19	Tertiary Clarifier	1	Dia 12.0Mtr X 5.50Ht
20	UF Feed Tank	1	12.0m X 5.0m X 3.0m
21	UF Permeate / RO I Feed Tank	1	12.0m x 8.0m x 5.0m
22	RO II Feed Tank	1	6.0m x 5.0m x 5.0m
23	RO III Feed Tank	1	6.0m x 5.0m x 5.0m
24	RO Permeate Tank	1	17.0m x 11.0m x 3.3m
25	RO III Reject / MEE Feed Tank - 1	1	10.0m x 5.0m x 3.5m
26	RO III Reject / MEE Feed Tank - 2	2	3.25m x 5.5m x 2.5m
27	RO Stage I A		8" Membrane - 48 Nos

28	RO Stage I B		8" Membrane - 48 Nos
29	RO Stage II		8" Membrane - 36 Nos
30	RO Stage III		8" Membrane - 8 Nos
31	MEE Reject Tank	1	6.8m x 3.8m x 1.3m
32	MEE - I (3FF + 1 FC)		12.5 KL/Hr.
33	MEE - II (3FF)		3.0 KL/Hr.
34	Crystallizer Feed Tank	1	4.5m x 2.3m x 2.1m
35	Crystallizer		1500 Kgs/Hr.
36	MEE (Forced Circulation) Feed Tank	1	5.6m x 2.0m x 1.8m
37	MEE Forced Circulation (3 FC)		2.0 KL/Hr.
38	Pusher Centrifuge	1	2000 Kgs/Hr.
39	Filter Press (For Residual Slurry)	1	800mm X 800mm - 50Pt
40	ATFD		500 Kgs/Hr.
PRINTING EFFLUENT TREATMENT PLANT			
41	Collection Tank	1	6.0m x 5.0m x 5.0m
42	Equalization Tank	1	6.0m x 5.0m x 5.0m
43	Degasification Tank	1	3.0m x 6.5m X 5.5m
44	Treated Water Storage Tank	1	4.0m x 5.0m X 5.0m
45	Filter Press (For Chemical Sludge)	1	915mm X 915mm - 66Pt
46	Temporary Sludge Storage shed	1	21.0m x 15.0m X 4.0m
47	Final Residual Salt Storage Shed	1	21.0m x 15.0m X 4.0m

List of Chemical Used in the Treatment Process

S.No.	Chemicals
1	Lime power
2	Sodium Hypo Chloride
3	Hydrochloric acid
4	SMBS
5	SpectraGuard
6	SLS
7	EDTA
8	Ferrous sulphate
9	Citric acid
10	Antiscalant 965
11	Nitric acid
12	Maxflock C22
13	Bioguard shock

A.9. Implementation Benefits to Water Security

Textile industry effluents contain a variety of chemicals, including hydrogen peroxide, sodium hypochlorite, sodium hydrosulfite, and sodium dithionite, along with smaller amounts of phosphates, nitrates, and salts of sodium and calcium. Additionally, the use of sodium chloride for preservation and pickling, as well as sulfate salts (primarily basic chromium sulfate) in dyeing and finishing processes, contributes significantly to the total dissolved solids (TDS) in the effluent. Further, there are various finishing operations further add to the salt load in the wastewater.

It is noted that the bulk of the hydrogen peroxide, sodium hypochlorite, sodium hydrosulfite emanates from the operations and the dying operations from semi-processed (EI/Wet blue) to finishing of washing result in effluent containing TDS, on a lower scale, mostly in the form of sulphates.

The implementation of ETPs has been crucial in safeguarding aquatic ecosystems in Bhavani River and soil health by effectively treating this harmful effluent.

Recycling wastewater from Dying and returning it to the production process after treatment is a pivotal step toward sustainability. This circular approach significantly reduces the reliance on groundwater, a precious natural resource. By minimizing the demand for fresh water, dying industries can contribute to water conservation efforts and alleviate pressure on depleting aquifers.

This project aims to inspire all Textile industries, particularly large multinational corporations, to implement sustainable water management practices. By demonstrating effective strategies for reducing captive water consumption and responsibly managing groundwater, the project hopes to foster a broader adoption of environmentally responsible approaches within the industry.

A9.1 Objectives vs Outcomes

The impact assessment or objectives of this project activity can generally be enumerated as follows:

- The project activity highlights the catalytic role that corporate India must play vital role in reducing industrial water consumption as well as water pollution per unit of industrial output.
- The PP has showcased technology that creates safe industrial grade water from an effluent source and has overcome the challenges faced by the alternate methods implemented and/or being proposed for the same.
- The PP has showcased the successful wastewater treatment of industrial effluent, thus saving millions of liters of wastewater for the production of Lether.
- The project activity showcases best-in-class wastewater treatment technology that can replace the equivalent freshwater and industrial demand in different sectors for nonportable purposes while reducing the proportion of untreated wastewater and substantially increasing recycling and safe reuse in India.

A9.2 Interventions by Project Owner / Proponent / Seller

The project aligns with sustainable resource management by prioritizing the reuse of treated effluent over depleting groundwater sources. The PP has voluntarily invested in treating and reusing effluent, conserving millions of liters of potable water for the city.

As population growth and rising living standards increase water demand, groundwater, which supplies 85% of rural areas, faces increasing pressure. Overexploitation has led to declining water tables, water shortages, saltwater intrusion in coastal regions, and higher energy costs for pumping.

The PP's initiative has directly contributed to water security in the region. By avoiding excessive groundwater extraction, the project helps mitigate issues like falling water levels, water scarcity, saltwater intrusion, and increased energy consumption for pumping.

A.10. Feasibility Evaluation

The installed ETP and ZLD System by the PP are robust and smoothly adapts to variations in wastewater effluent. Before establishing the project, PP has done the feasibility test as per **DPR** (Detailed Project Report)

A.11. Ecological Aspects & Sustainable Development Goals (SDGs):

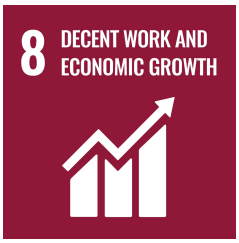
This project demonstrably achieves sustainable management and efficient utilization of India's natural resources. The project proponent (PP) had the option to install borewells, potentially depleting local groundwater reserves. Alternatively, they could have continued relying on existing, potentially potable, water resources registered with the Universal Water Registry.

Recognizing the environmental impact, the PP commendably opted for a more sustainable approach. They chose to treat and reuse the effluent generated by the Common Effluent Treatment Plant (CETP), resulting in significant water savings for the dying operations, measured in millions of liters.

This project encourages the industrial sector, particularly large-scale leather processing facilities, to adopt similar sustainable practices regarding their captive water needs and overall groundwater management.

The ETP effectively treats the textile's effluent, and the use of impervious machinery within the ETP area further safeguards against potential leakage and contamination of surrounding soil.

The sustainable development attributes attached to the project activity are demonstrated below:

Sustainable Development Goals Targeted	Most relevant SDG Target/Impact	Indicator (SDG Indicator)
	13.2: Integrate climate change measures into national policies, strategies and planning	Recycling and reusing wastewater is an effective solution for climate change adaptation because it helps mitigate the impacts of droughts, floods, and other extreme weather events that are becoming increasingly common due to climate change due to water scarcity. The quantity of wastewater recycled and reused by the PP is the SDG indicator.
	3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	The PP showcases how recycling and reusing wastewater can prevent depletion of natural water reserves and prevent water scarcity during droughts. The hazardous impact of industrial wastewater is now avoided due to this project. The PP ensures water availability in water-scarce zones that help promotes healthy lives and well-being in the region.
	6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	The PP has showcased recycling and safe reuse of 2.28 million liters within the industry during this monitored period, which directly correlates to this indicator 6.3.
	8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	Number of jobs created and also the Number of people trained as part of this project activity.

	15.2.1 Progress towards sustainable forest management.	The PP has implemented a Green Belt project in the SIPCOT area to revitalize the local ecosystem. 

A.12. Recharge Aspects:

NA

Water Budget Component	Typical Estimated Uncertainty (%)	Description
Surface Inflow	1%	In accordance with the RoU Standard version 7, and considering that the flow meters are calibrated, PP has accounted for a 1% uncertainty factor in both inflow and outflow volumes to maintain a conservative approach. Consequently, an uncertainty factor of 0.98 is applied to all ROUs.
Precipitation	NA	Not available
Surface Outflow	1%	In accordance with the RoU Standard version 7, and considering that the flow meters are calibrated, PP has accounted for a 1% uncertainty factor in both inflow and outflow volumes to maintain a conservative approach. Consequently, an uncertainty factor of 0.98 is applied to all ROUs.
Evapotranspiration	NA	Not available
Deep Percolation	NA	Not available

A.13. Quantification Tools

Baseline scenario:

The baseline scenario is the situation where, in the absence of the project activity, the PP would have **one or all** of the below options:

- (a) installed multiple bore wells within the project boundary which would have depleted the local groundwater resources (aquifers); **and/or**
- (b) diverted existing safe drinking water resources from the surrounding residential area; **and/or**
- (c) discharged the ETP effluent without further recycling and reuse.

Hence the following baseline scenario is applicable for this project activity:

"The net quantity of treated ETP effluent / wastewater that would be discharged directly into the local drain/sewer without further being recycled and/or reused daily post treatment per year"

The net quantity of treated water used is measured via flow meters installed at the site. The primary set of data records are kept at plant level, managed by Exim ETP team which is Mentioned in Appendix. Also, for conservative purposes, the working days or operational days have been assumed at 330 days in a year during the 1st monitoring period **(01/01/2021 to 31/12/2024)**. However, the number of days is not an influential parameter on RoUs calculation as RoUs are calculated based on total quantity of treated water being recycled & reused.

Month	Etp Feed	Ro-I Permeate	Ro-II Permeate	Ro-III Permeate	Mee Condensate	Forced Condensate	Total Treated Water	RoUs (RO Per + MEE/Forced cond)*0.98	Year wise
Jan-21	7444.69	3936.3	1578.07	633.43	825.44	70.46	7043.7	6902.826	**126933**
Feb-21	6964.03	3644.08	1527.52	628.98	823.34	71.75	6695.67	6561.7566	
Mar-21	7931.3	4279.42	1719.28	720.22	925.75	77.35	7722.02	7567.5796	
Apr-21	11204.24	6592.01	2161.05	905.95	1222.75	109.7	10991.46	10771.6308	
May-21	4476.57	2642.72	841.44	364.48	1516.83	21.54	5387.01	5279.2698	
Jun-21	3261.7	1813.3	714.2	276	320.63	24.37	3148.5	3085.53	
Jul-21	11748.5	6717.74	3008.27	897.31	1621.62	83.87	12328.81	12082.2338	
Aug-21	13660.8	8037.9	2546	1032.7	1599	194.6	13410.2	13141.996	
Sep-21	16847.4	10626.5	3179.7	1292.6	1599.3	231.2	16929.3	16590.714	
Oct-21	17022.6	10657.8	3303.1	1316	2085.9	261	17623.8	17271.324	

Nov-21	13049.7	8114.8	2576.8	1068.7	1653.1	206	13619.4	13347.012	
Dec-21	14386.5	8906.3	2760.7	1081.4	1628.6	246.5	14623.5	14331.03	
Jan-22	15320.2	9465.2	2835.8	1103.2	1636.3	217.1	15257.6	14952.448	
Feb-22	15849.4	9689.4	2883.6	1105.2	1733.4	219	15630.6	15317.988	
Mar-22	18892.2	11498.7	3496.5	1285.3	2122.5	235.9	18638.9	18266.122	
Apr-22	17232.9	10515.3	3259.6	1261.5	1832.1	224.2	17092.7	16750.846	
May-22	15791.4	9415.8	3059.1	1205.7	2100.9	237.2	16018.7	15698.326	
Jun-22	13852.1	8182.7	2790.9	1044.6	1486.2	236.9	13741.3	13466.474	
Jul-22	14919.3	8695.2	2849.3	1046.4	1677.4	232.6	14500.9	14210.882	**171045**
Aug-22	14935.2	8075.8	2642.2	972.7	2921.7	157.5	14769.9	14474.502	
Sep-22	13298.2	7839.4	2740.4	1031.6	1320.15	155	13086.55	12824.819	
Oct-22	7105.1	4378.8	1176.9	461.5	651.5	127.9	6796.6	6660.668	
Nov-22	13549.5	8514.5	2445	894.3	1294.7	214	13362.5	13095.25	
Dec-22	15653.2	9660.6	2876.3	1097.9	1762.1	242.1	15639	15326.22	
Jan-23	14818.5	9230.0	2588.4	966.1	1605.3	249.6	14639.3463	14346.55937	
Feb-23	12315.9	7621.8	2207.6	831.9	1317.4	192.4	12171.013	11927.59274	
Mar-23	12305.2	7616.0	2166.9	788.0	1190.1	183.4	11944.325	11705.4385	
Apr-23	12861.4	8051.3	2211.7	845.9	1365.6	180.7	12655.179	12402.07542	
May-23	11384.4	7951.3	2288.1	836.4	1251.2	80.8	12407.777	12159.62146	
Jun-23	11320.7	7347.8	2111.0	812.5	1343.3	130.4	11744.875	11509.9775	
Jul-23	14722.2	9315.6	2541.0	1000.3	1575.3	210.7	14642.79	14349.9342	**159101**
Aug-23	13678.7	8601.1	2411.9	964.1	1663.0	201.1	13841.118	13564.29564	
Sep-23	14921.4	9362.6	2652.8	1021.5	1432.6	206.7	14676.221	14382.69658	
Oct-23	17015.9	10543.6	3069.6	1202.6	1867.6	277.6	16961.094	16621.87212	
Nov-23	11019.2	6938.4	1869.7	704.6	1195.6	237.4	10945.699	10726.78502	
Dec-23	15426.3	9777.9	2749.1	1071.1	1796.8	324.2	15719.001	15404.62098	
Jan-24	12900.2	8252.7	2263.2	844.8	1339.0	270.1	12969.717	12710.32266	
Feb-24	12317.4	7811.5	2150.7	822.9	1285.2	209.0	12279.422	12033.83356	
Mar-24	11909.4	7536.4	2073.3	759.2	1287.9	119.2	11775.953	11540.43394	
Apr-24	11473.3	7334.2	1974.9	750.9	1314.4	114.7	11489.111	11259.32878	
May-24	13358.9	8505.7	2310.4	871.3	1617.5	205.6	13510.456	13240.24688	
Jun-24	13724.0	8684.2	2365.0	853.8	1629.1	153.5	13685.54	13411.8292	
Jul-24	15890.8	9919.6	2806.5	1024.9	1719.3	194.5	15664.819	15351.52262	**170195**
Aug-24	16949.1	10726.7	2887.0	1052.1	1884.8	260.1	16810.635	16474.4223	
Sep-24	15835.8	10089.6	2740.7	953.8	1713.2	265.0	15762.308	15447.06184	
Oct-24	17582.6	11217.6	3048.5	1100.3	2062.8	321.8	17751.003	17395.98294	
Nov-24	14048.4	9060.8	2478.3	903.1	1554.3	222.2	14218.707	13934.33286	
Dec-24	17582.6	11217.6	3048.5	1100.3	2062.8	321.8	17751.003	17395.98294	
					Total			**627274**	**627274**

Quantification

Year	Total ROUs (1000 liters)/yr UCR Cap(1 million RoUs/yr
2021	126933
2022	171045
2023	159101
2024	170195
Total RoUs	**627274**

A.14. UWR Rainwater Offset Do No Net Harm Principles

According to the UCR RoU Standard principles, the project activity accomplishes the following:

• Increases the sustainable water yield in areas where over development has depleted the aquifer
According to the data released by the Central Groundwater Board in 2021, the total amount of groundwater that can be utilised in India in a year is 398 billion cubic meters (BCM), of which, approximately 245 BCM is currently being utilised, which is about 62 per cent of the total. But the level of exploitation of groundwater is very high in States like Punjab, Rajasthan, Haryana, Delhi and Tamil Nadu. This project activity was commissioned in 1995, and the PP has reduced the proportion of untreated wastewater that future generations would need to recycle and has showcased recycling and safe reuse within the industry from unutilized water resources. Revenue from the sale of UCR RoUs will enable scaling up of such project activities.
• Collect unutilized water or rainwater and preserve it for future use
In India, at the district level, in 24 states/UTs, as many as 267 districts had stages of groundwater extraction more than 63 per cent, ranging from 64 per cent to 385 per cent (source: https://www.business-standard.com/article/current-affairs/from-58-to-63-india-pumped more-groundwater-between-2004-and-2017-121122101377_1.html). This project activity serves as an example to recycle and reuse wastewater and encourages companies, especially large and transnational companies in the biotechnology and biopharmaceuticals sector, to adopt similar sustainable practices in regard to captive water requirements and groundwater management.
• Conserve and store excess water for future use
The project activity decreases the dependence on groundwater, thereby preventing excessive depletion.

Between 2021 to 2023, the project activity has reused 2.8 million liters of ETP effluent successfully post treatment with gainful end use of the same.

A.15. Scaling Projects-Lessons Learned-Restarting Projects

The successful implementation of the Effluent Treatment Plant (ETP) at Perundurai by Exim Knits Private Limited, particularly its robust Zero Liquid Discharge (ZLD) system, provides a valuable blueprint for scaling similar initiatives across the water-intensive textile sector. However, expanding such complex environmental infrastructure demands a strategic approach that integrates past learnings and addresses potential challenges in restarting or re-envisioning projects.

Scaling Projects:

To improve water management in India's dyeing industry, it's fundamental to expand the ETP model, similar to Exim Knits' cluster-based approach, by setting up shared treatment plants in other textile areas like Ahmedabad, Jaipur, and Surat, customizing them to local needs. This involves upgrading treatment systems with advanced technologies such as RO, MEE, ultrafiltration, and nanofiltration to recover cleaner water for industrial reuse. Beyond water, a focus on Comprehensive Resource Recovery will involve extracting valuable salts from concentrated wastewater and exploring energy recovery from organic matter, fostering a more circular economy. Furthermore, implementing Effluent Reuse and Closed-Loop Systems with dedicated pipelines will facilitate direct water recycling within dyeing units, drastically cutting fresh water intake and wastewater discharge. Lastly, Urban Integration will strategically direct treated effluent to municipal systems for non-drinking uses, like watering parks or washing streets, thereby helping to conserve potable water supplies for broader urban management.

Scaling complex ZLD projects is not without its challenges, and insights from existing implementations are crucial:

[1]Water treatment is essential in the textile industry due to its high water usage and discharge of chemically contaminated effluents, which can severely impact the environment if not properly managed. Scaling up towards Zero Liquid Discharge (ZLD) is vital to meet regulatory standards, enhance water reuse, and promote sustainability. Advanced technologies like Membrane Bioreactors (MBR) offer high-quality biological treatment with smaller footprints, while Agitated Thin Film Dryers (ATFD) effectively handle concentrated waste streams by evaporating remaining moisture from brine. Integrating such technologies with RO, MEE, and other ZLD components, along with sustainable sludge management, financial planning, and stakeholder collaboration, ensures successful and scalable water treatment solutions in the textile sector.

[1] https://cpcb.nic.in/

Appendix> Effluent & Treated water Quality

TEST REPORT Accredited by NABL (Chemical & Biological)

Report No :	ECI-WA-2024/12/081	Report Date :	17.12.2024
Customer Name & Address	M/s. Exim Knits Pvt Ltd, Plot no. G9, F20 & F21, Sipcot Perundurai.		
Customer Reference :	IWO Date:11/11/2024	Sample Reference No :	ECI-WA-2024/12/081
Sample Drawn By :	ECI	Sample Received On :	12.12.2024
Sample Collected Date :	11.12.2024	Test Commenced On :	12.12.2024
Qty of Sample Received :	2 L	Test Completed On :	17.12.2024
Sample Description :	Water	Sampling Method :	IS 3025:Part 01
Sample Mark:	ETP Inlet		

S.No	PARAMETERS	UNITS	RESULTS	TEST METHOD
1.	Bio chemical oxygen demand (BOD @ 27°C for 3 days)	mg/L	71	IS 3025:Part 44
2.	Chemical Oxygen Demand (COD)	mg/L	350	IS 3025:Part 58
3.	Chlorides(as Cl)	mg/L	712	IS 3025:Part 32
4.	pH Value @ 25°C	--	8.2	IS 3025:Part 11
5.	Residual Chlorine	mg/L	< 0.1	IS 3025:Part 26
6.	Sulphates (as SO_4^{2-})	mg/L	328	IS 3025:Part 24
7.	Total Alkalinity (as $CaCO_3$)	mg/L	571	IS 3025 Part 23
8.	Total Dissolved Solids(TDS) @ 180°C	mg/L	1875	IS 3025:Part 16
9.	Total Hardness(as $CaCO_3$)	mg/L	632	IS 3025 Part 21
10.	Turbidity	NTU	< 0.5	IS 3025:Part 10

Remarks: BDL –Below Detectable Limit, DL – Detectable Limit

<--- End of Report --->

For ENVIRO CARE INDIA PRIVATE LIMITED
(Laboratory Division)

Verified By : K.K.Ajith

ENVIRO CARE INDIA PRIVATE LIMITED MADURAI .16.

Authorized Signatory

Inlet water Quality

TEST REPORT Accredited by NABL (Chemical & Biological)

Report No :	ECI-WA-2024/12/082	Report Date :	17.12.2024
Customer Name & Address	M/s. Exim Knits Pvt Ltd, Plot no. G9, F20 & F21, Sipcot Perundurai.		
Customer Reference :	IWO Date:11/11/2024	Sample Reference No :	ECI-WA-2024/12/082
Sample Drawn By :	ECI	Sample Received On :	12.12.2024
Sample Collected Date :	11.12.2024	Test Commenced On :	12.12.2024
Qty of Sample Received :	4 L	Test Completed On :	17.12.2024
Sample Description :	Water	Sampling Method :	IS 3025:Part 01
Sample Mark:	ETP Outlet		

S.No	PARAMETERS	UNITS	RESULTS	TEST METHOD	Max. Permissible Limits of TNPCB Std for Treated Effluent
1.	Bio chemical oxygen demand (BOD @ 27°C for 3 days)	mg/L	27	IS 3025:Part 44	30
2.	Chemical Oxygen Demand (COD)	mg/L	140	IS 3025:Part 58	250
3.	Chlorides(as Cl)	mg/L	553	IS 3025:Part 32	1000
4.	pH Value @ 25°C	--	7.4	IS 3025:Part 11	5.5 - 9
5.	Residual Chlorine	mg/L	< 0.1	IS 3025:Part 26	1.0
6.	Sulphates (as SO_4^{2-})	mg/L	251	IS 3025:Part 24	1000
7.	Total Alkalinity (as $CaCO_3$)	mg/L	445	IS 3025:Part 23	NA
8.	Total Dissolved Solids(TDS) @ 180°C	mg/L	1430	IS 3025:Part 16	2100
9.	Total Hardness(as $CaCO_3$)	mg/L	472	IS 3025 Part 21	NA
10.	Turbidity	NTU	< 0.5	IS 3025:Part 10	NA

Opinion: The above Parameters meets the requirements of TNPCB norms. BDL –Below Detectable Limit, DL – Detectable Limit, NA – Not Applicable

<--- End of Report --->

For ENVIRO CARE INDIA PRIVATE LIMITED
(Laboratory Division)

Verified By : K.K.Ajith

ENVIRO CARE INDIA PRIVATE LIMITED MADURAI .16.

Authorized Signatory

Outlet water Quality

Appendix> EMF Details

iReM Viewer - EXIM

Refresh Now | Groupwise Display | Live Camera | Error Log | About

Current Date & Time: 16 May 2025 19:29:15 Next Readings @: 16 May 2025 19:29:01

Water | Energy | Pressure | PH | TDS

Meter Name	Date & Time	Flow Rate (m3/hr)	Totalizer (m3)	Current (mA)	SMS On Fail	ErrorMsg
RO-II Permeate	16 May 2025 19:28	0	194643.934	0	☑	
RO-II Reject	16 May 2025 19:28	0	235940.633	0	☑	
RO-III Feed	16 May 2025 19:28	0	577.129	0	☑	
RO-III Permeate	16 May 2025 19:28	0	90691.315	0	☑	
RO-III Reject	16 May 2025 19:28	0	274.076	0	☑	
MEE Feed	16 May 2025 19:28	0	89974.729	0	☑	
MEE Condensate	16 May 2025 19:28	0	10695.09	0	☑	
MEE Reject	16 May 2025 19:28	0	27962.026	0	☑	
MEE Recirculation	16 May 2025 19:28	0	1768.363	0	☑	
Crystalizer Feed	16 May 2025 19:28	0	18343.426	0	☑	
Boiler Feed	16 May 2025 19:28	0	80589.185	0	☑	
Process Make Up	16 May 2025 19:28	0	104495.041	0	☑	
Domestic	16 May 2025 19:28	0	11381.5	0	☑	
Forced Feed	16 May 2025 19:28	0	21146.684	0	☑	
Forced Condensate	16 May 2025 19:28	0	11004.298	0	☑	
STP Feed-1	16 May 2025 19:28	0	756.409	0	☑	
STP Feed-2	16 May 2025 19:28	0	668.657	0	☑	

Port	Settings
COM - 3	9600, 8, 0, 1
COM - 4	9600, 8, 0, 1
COM - 5	9600, 8, 0, 1
COM - 6	9600, 6, 0, 1

Status	Meters
1. Total Meters	74
2. Ok	74
3. Not Ok	0

Event	Time
Last Read @	16-05-2025 19:28:00
Last Online Update to TNPCB @	16-05-2025 19:27:00
AMCValid Until	11-10-2025 00:00:00
DSC valid upto	02-01-2026 00:00:00
SMS Credit balance	2663

Service iReM on DESKTOP-5VJO5PN is running. | Internet connected | SMS site connected

Search

ENG IN 19:29 16-05-2025

Electromagnetic Flow Meters & Readings

Appendix> Calibration Report

REGAL CALTECH (OPC) PRIVATE LIMITED
54, Avinashi New Town, Avinashi,
Tiruppur - 641654, Tamil Nadu, India.
Phone : +91 73739 22120 | E-mail : lab@regaltech.in

CALIBRATION CERTIFICATE OF FLOW METER

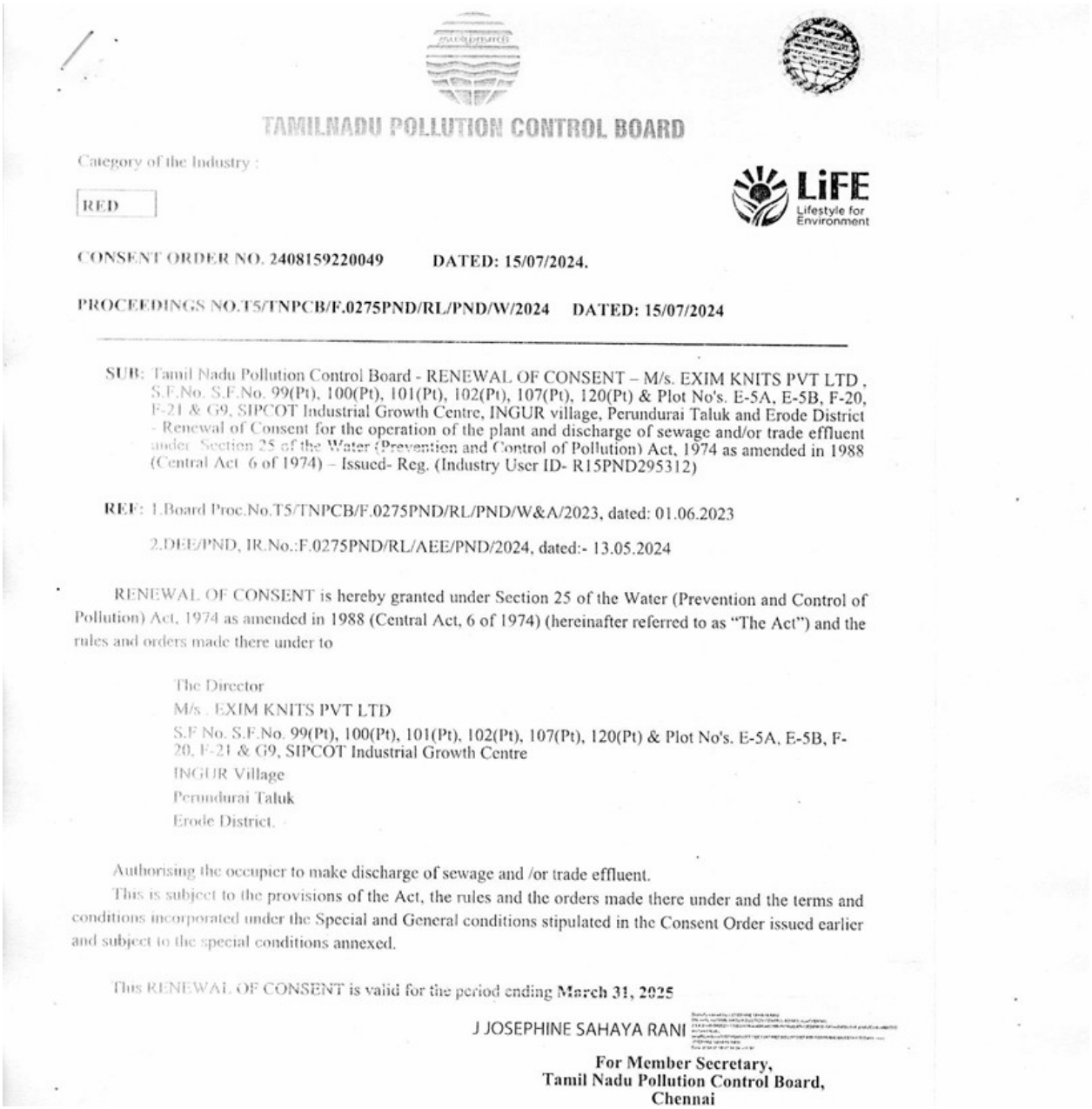
Customer Name	: Exim Knits Private Limited (Processing Division).		
Address	: Plot No; G-9, F-21, F-20, E-5A & E-5B, SIPCOT Industrial Growth Centre, Perundurai - 638 052.		
Receipt Date	: 17.03.2025	Certificate No.	: RC-CC-250317-208N
Calibration ID	: CAL-250317-2	Issue Date	: 18.03.2025
Calibration Date	: 17.03.2025	Page	: 1 of 1
Next Calibration Due	: 17.03.2026		
Equipment Name	: Flow Meter	Range & Readability	: 9,99,99,999 Litres
Make & Model	: FREHNIG 2040	Equipment ID	: EK/FLM-08
Serial No.	: 1219-7663	Location	: RO-1A Reject-II
Mode of Calibration	: In-House	Temperature	: 29.1 ºC
Equipment Condition	: Satisfactory	Relative Humidity	: 57.6 %

Calibration Procedure : : The water flow meter is connected to a cylindrical drum of 1000 litres volume ,whose dimensions are measured using a calibrated measuring tape (to calculate the volume).Water is allowed to flow through the flow meter. The meter reading is compared against the fixed mark in the drum for every 100 litres of delivery.

#	Master Equipment	Traceability	Valid Up to
1	Cylindrical Drum of 1000 litres of Volume graduated using Calibrated Measuring Tape.	RC-250212-101	12.02.2026

Calibration Result				
Cumulative Water Discharged	Flow meter Reading		Deviation	
	Start	End	Per 100 l	Cumulative
(l)	(l)	(l)	(l)	(l)
100	157567.35	157668.35	1	1
200	157668.35	157768.35	0	1
300	157768.35	157869.35	1	2
400	157869.35	157969.35	0	2
500	157969.35	158069.35	0	2
600	158069.35	158168.35	-1	1
700	158168.35	158268.35	0	1
800	158268.35	158369.35	1	2
900	158369.35	158469.35	0	2
1000	158469.35	158569.35	0	2

Appendix> Consent for Operation & Discharge of sewage /Trade Effluent



TAMILNADU POLLUTION CONTROL BOARD

Category of the Industry :

RED

LiFE Lifestyle for Environment

CONSENT ORDER NO. 2408159220049 DATED: 15/07/2024.

PROCEEDINGS NO.T5/TNPCB/F.0275PND/RL/PND/W/2024 DATED: 15/07/2024

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT – M/s. EXIM KNITS PVT LTD , S.F.No. S.F.No. 99(Pt), 100(Pt), 101(Pt), 102(Pt), 107(Pt), 120(Pt) & Plot No's. E-5A, E-5B, F-20, F-21 & G9, SIPCOT Industrial Growth Centre, INGUR village, Perundurai Taluk and Erode District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg. (Industry User ID- R15PND295312)

REF: 1.Board Proc.No.T5/TNPCB/F.0275PND/RL/PND/W&A/2023, dated: 01.06.2023

2.DEE/PND, IR.No.:F.0275PND/RL/AEE/PND/2024, dated:- 13.05.2024

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Director
M/s . EXIM KNITS PVT LTD
S.F No. S.F.No. 99(Pt), 100(Pt), 101(Pt), 102(Pt), 107(Pt), 120(Pt) & Plot No's. E-5A, E-5B, F-20, F-21 & G9, SIPCOT Industrial Growth Centre
INGUR Village
Perundurai Taluk
Erode District.

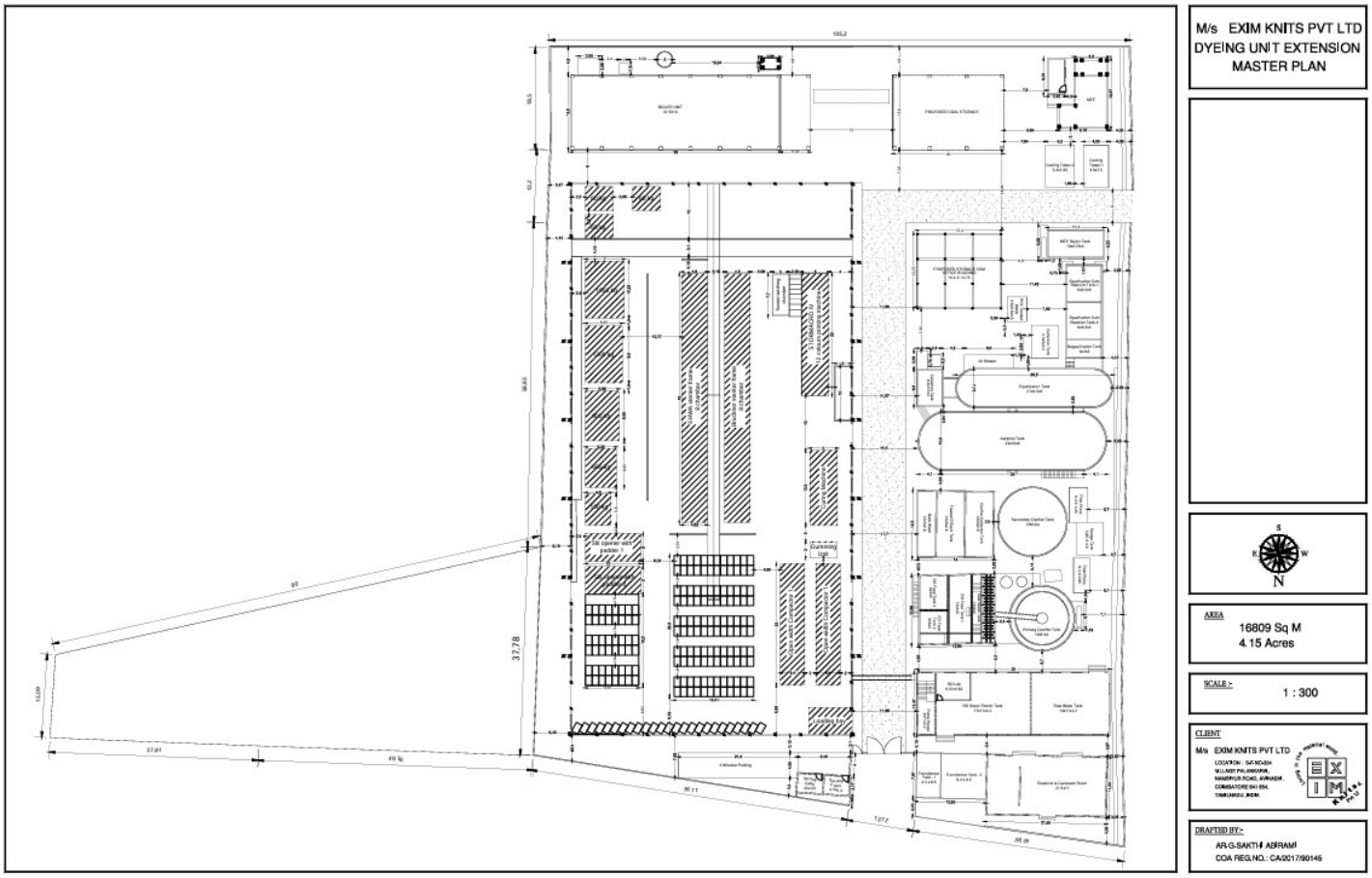
Authorising the occupier to make discharge of sewage and /or trade effluent.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This RENEWAL OF CONSENT is valid for the period ending **March 31, 2025**

J JOSEPHINE SAHAYA RANI

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai



Plant Layout