UWR Rainwater Offset Unit Standard

(UWR RoU Standard)

Concept & Design: Universal Water Registry

www.uwaterregistry.io

Project Concept Note & Monitoring Report

(PCNMR)

Project Name : Initiative for waste water recycle and reuse by ST COTTEX EXPORTS PRIVATE LIMITED

UWR RoU Scope: 5

Monitoring Period: 01/01/2018 - 31/12/2024

Crediting Period: 01/01/2018 - 31/12/2024

UNDP Human Development Indicator: 0.644 (India)

A.1 Location of Project Activity

<table>
<tr><td>Title</td><td colspan="3">Initiative for waste water recycle and reuse by ST COTTEX EXPORTS PRIVATE LIMITED</td></tr>
<tr><td>Country</td><td colspan="3">India</td></tr>
<tr><td>State</td><td colspan="3">Punjab</td></tr>
<tr><td>District</td><td colspan="3">Ludhiana</td></tr>
<tr><td>Block Basin/Sub Basin/Watershed</td><td colspan="3">Sutlej Basin</td></tr>
<tr><td rowspan="3">Project location</td><td>Name of the Village</td><td>Latitude</td><td>Longitude</td></tr>
<tr><td>Machhiwara</td><td>30°54'36.5"N</td><td>76°09'03.7"E</td></tr>
<tr><td>Machhiwara</td><td>30°54'25.5"N</td><td>76°09'03.0"E</td></tr>
<tr><td>Type and Scope of RoU Project Activity</td><td colspan="3">Type Scope 5: Conservation measures taken to recycle and/or reuse water, spent wash, 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.</td></tr>
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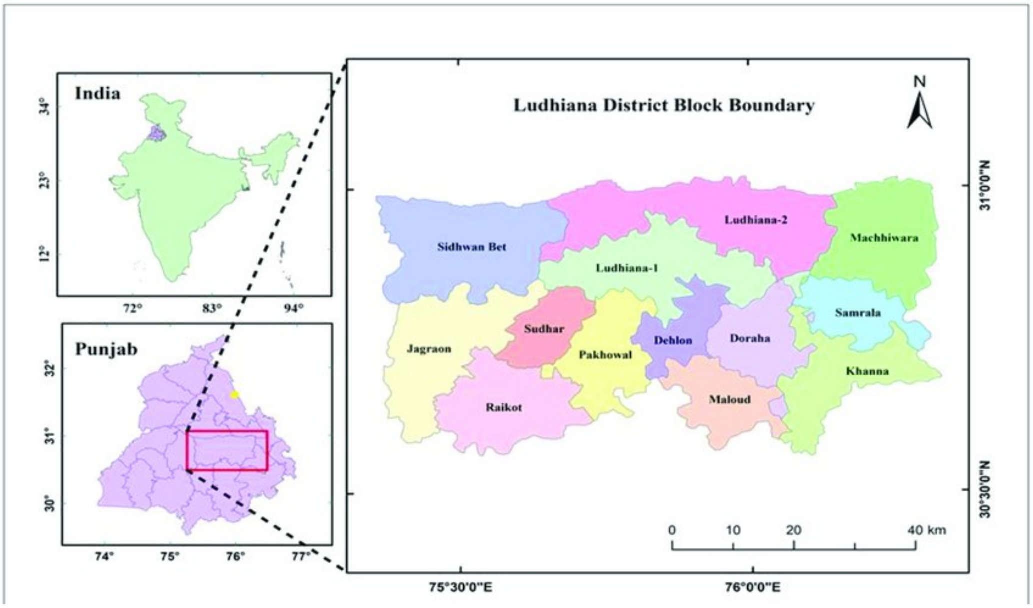
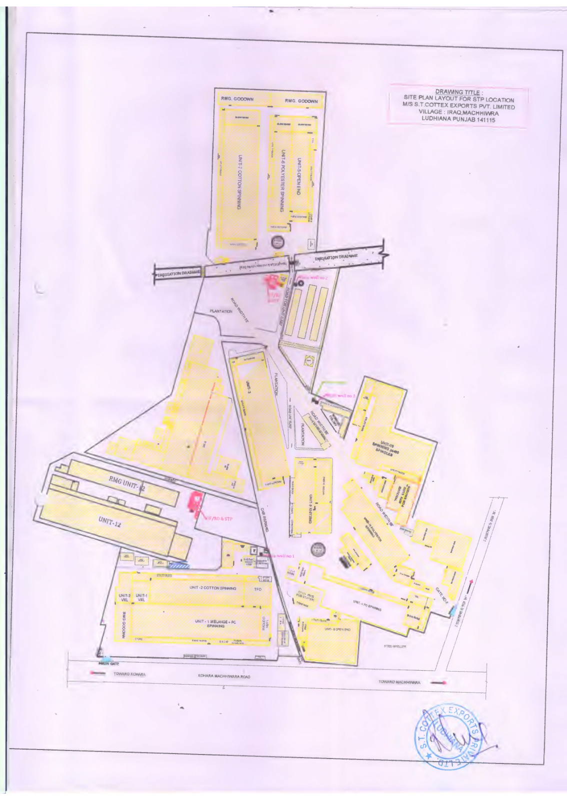
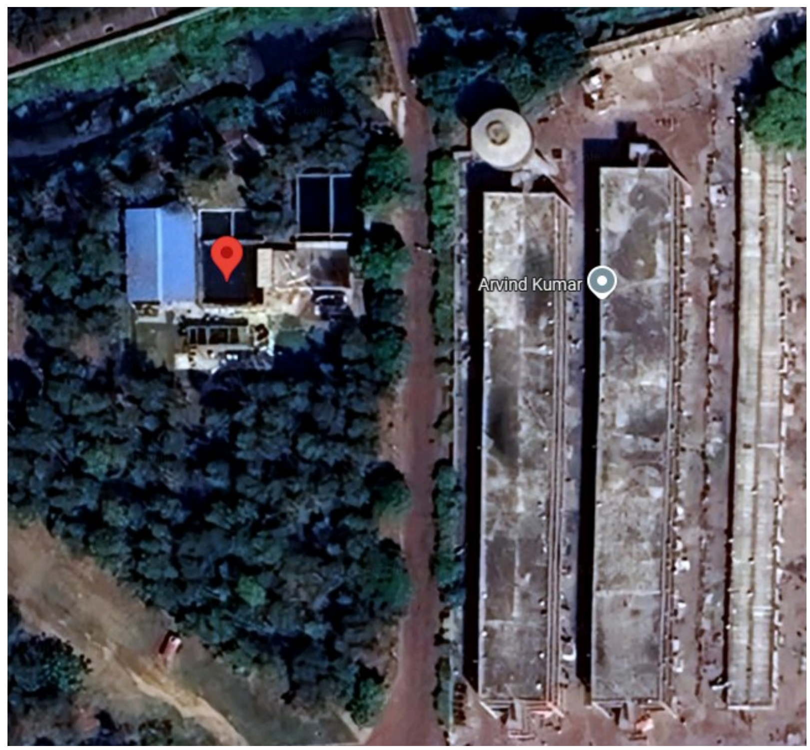
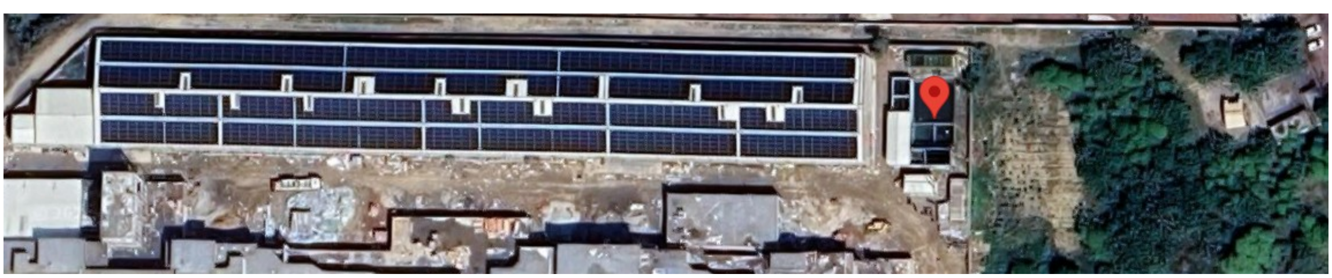






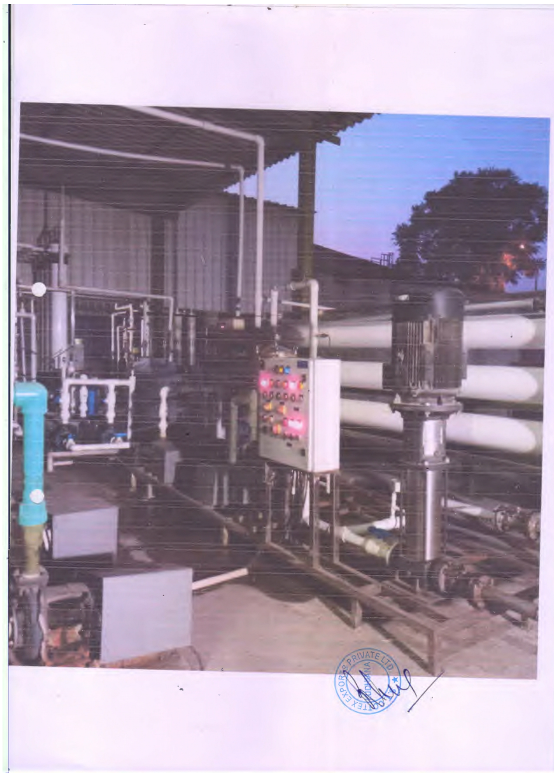


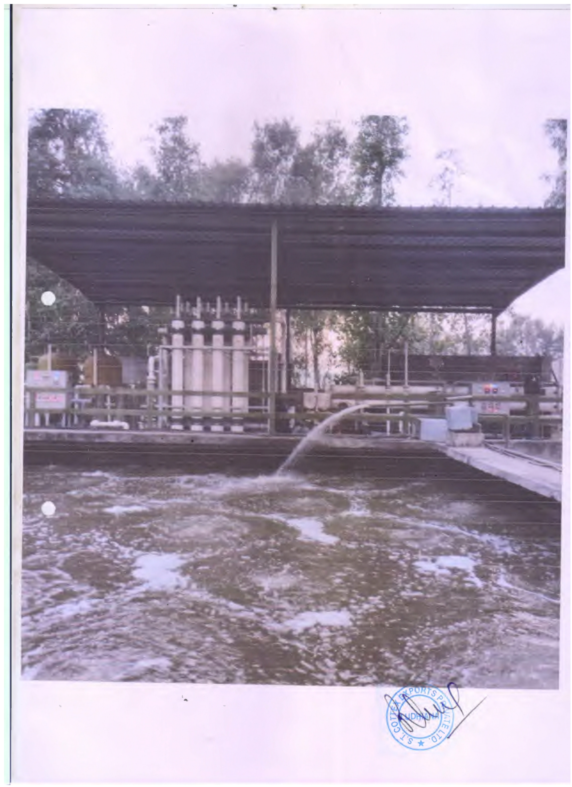
Project Site

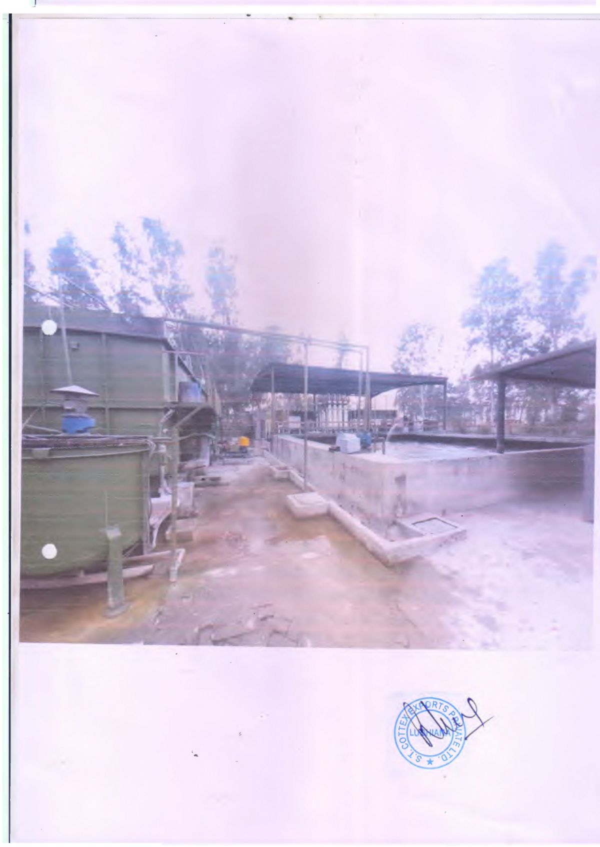
A.2. Project owner information, key roles and responsibilities

The project participant, S.T. Cottex Exports Pvt. Ltd., is a leading textile manufacturer based in North India, has established itself as a vertically integrated spinning and knitting operation with a production capacity of 220 metric tons per day.

ST Cottex Exports Private Limited, as the project participant, owns the water user rights within the project boundary, ensuring full control over the management and utilization of water resources. Additionally, the company holds the legal land title for the designated project area. All necessary permits required for the project's execution have been obtained, or applications have been submitted to the relevant regulatory authorities, ensuring compliance with environmental and industrial guidelines. These approvals validate the project's commitment to sustainable water management and adherence to legal frameworks governing water reuse and treatment.





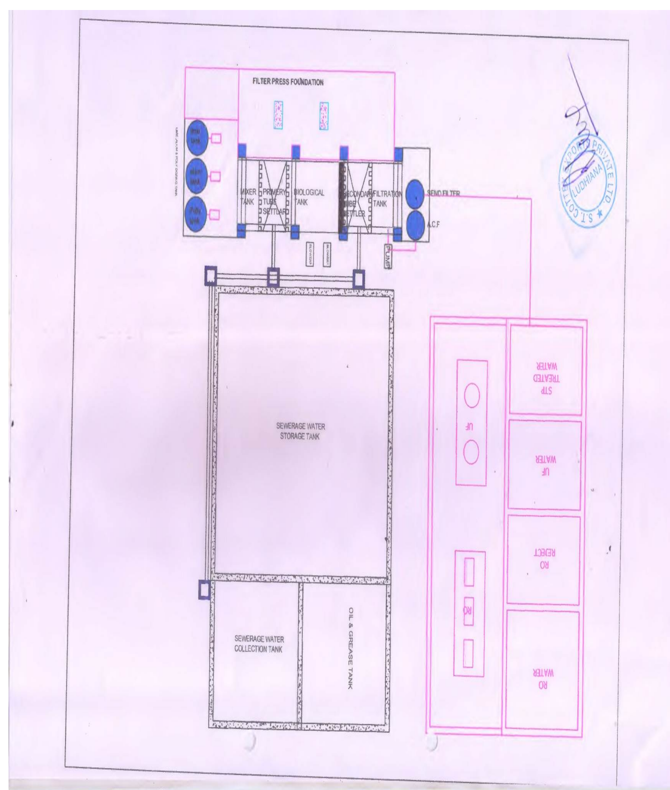


Treatment Plant

A.2.1 Project RoU Scope

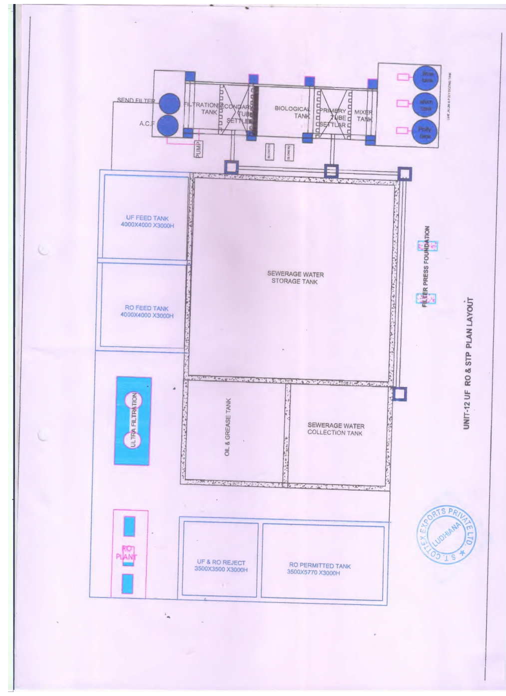
PROJECT NAME	Initiative for waste water recycle and reuse by ST COTTEX EXPORTS PRIVATE LIMITED
UWR Scope:	Type Scope 5: Conservation measures taken to recycle and/or reuse water, spent wash, wastewater etc. across or within specific industrial processes and systems, including wastewater recycled/ reused 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	

The project consists of the development of a 900 KLD wastewater recycling system designed to treat and reuse effluent efficiently, significantly reducing reliance on freshwater resources. In the absence of this project activity, ST COTTEX EXPORTS PRIVATE LIMITED would have depended on groundwater extraction to meet its water demands, exacerbating the already critical issue of water scarcity in India. With urban and industrial sectors generating over 72,368 million liters of wastewater daily, only 37% of which is currently treated, the challenge of wastewater management remains a pressing concern[1]. The baseline scenario involved the discharge of untreated or partially treated wastewater, leading to groundwater depletion and environmental pollution. However, through the advanced treatment processes implemented—including Effluent Treatment Plants (ETPs), ultrafiltration (UF), and reverse osmosis (RO) systems—



Site Layout

the project now ensures the recycling and reuse of water, reducing the dependency on groundwater and promoting a sustainable water management approach.



Site Lavout

A.3. Land use and Drainage Pattern

Not Applicable

A.4. Climate

Not Applicable

A.5. Rainfall

Not Applicable

A.6. Ground Water

Not Applicable

A.7. Alternate methods

1. **Stormwater Harvesting:**
   Stormwater harvesting offers an alternative method for addressing water scarcity, especially in regions with high rainfall variability. But due to the high-water demand of the textile industry rainwater harvesting alone cannot meet operational needs year-round.

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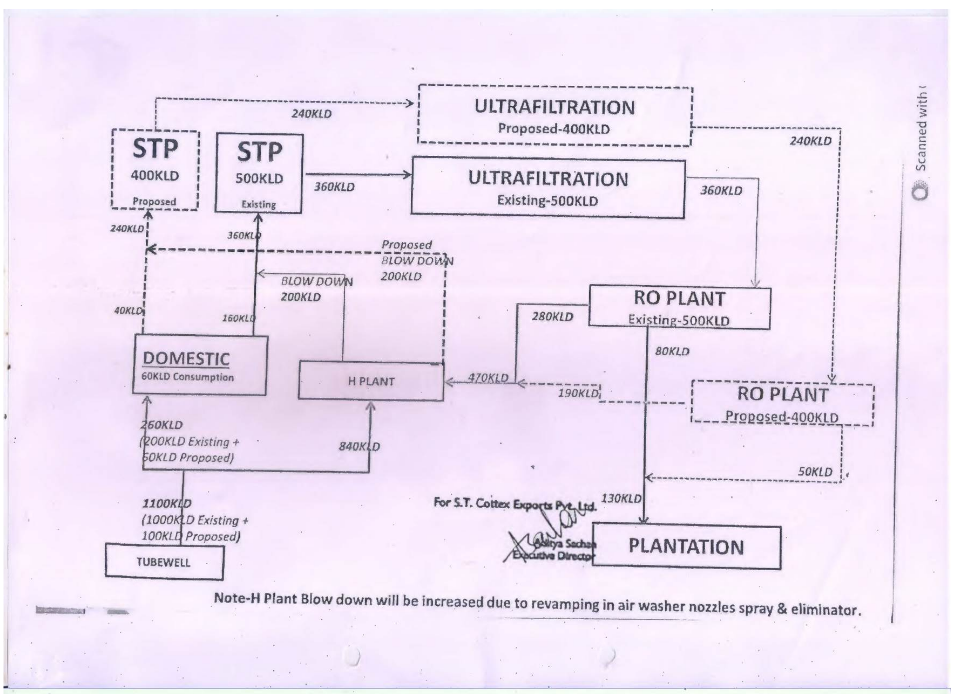
[1] *https://pib.gov.in/Pressreleaseshare.aspx?PRID=1779784#:~:text=As%20per%20the%20report%20of,of%2031841%20mld %20is%20available*.

2. **Traditional Groundwater Extraction**: Industries and institutions often rely on groundwater abstraction for non-potable water requirements, particularly in regions where aquifers are accessible. But due to the depleted groundwater resources it further exacerbates water scarcity

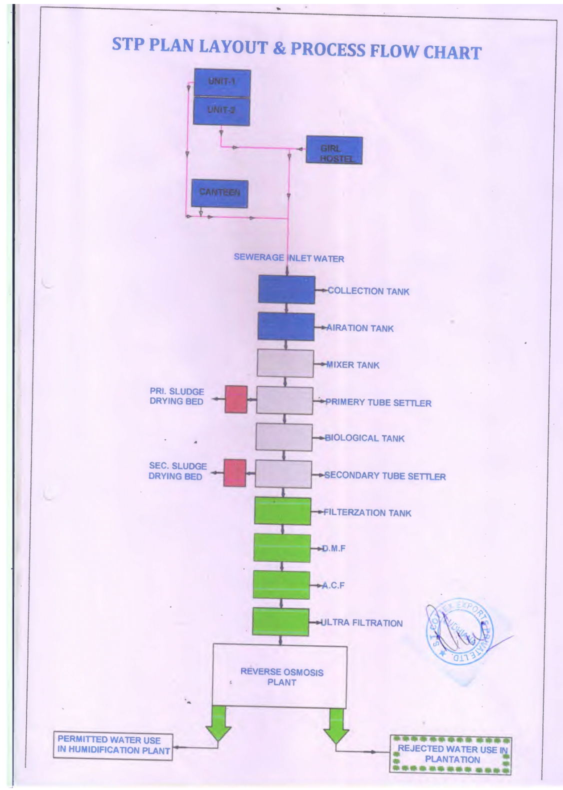
3. **Surface Water Utilization** An innovative method gaining traction is nutrient recovery from wastewater, particularly in agricultural applications. By recovering nutrients like nitrogen and phosphorus from treated wastewater, it is possible to reduce the need for chemical fertilizers. This method not only helps in managing wastewater but also supports sustainable agricultural practices. With India generating significant amounts of wastewater daily, implementing nutrient recovery could reduce both environmental and agricultural dependency on chemical fertilizers, providing dual benefits of waste management and improved crop yields.

A.8. Design Specifications



Site Layout

This project entails the installation and operation of two Sewage Treatment Plants (STPs) at an industrial facility to recycle wastewater effectively and minimize groundwater abstraction by 75-80%. The project involves an existing 500 KLD STP at Unit 5 and a proposed 400 KLD STP at Unit 12, cumulatively providing a total treatment capacity of 900 KLD. The primary objective is to treat 650 KLD of wastewater generated from domestic sources (250 KLD) and the Humidity Plant (400 KLD) and recycle the treated water for non-potable uses and in the Humidity Plant, with 25% of reject water is utilized for plantation,



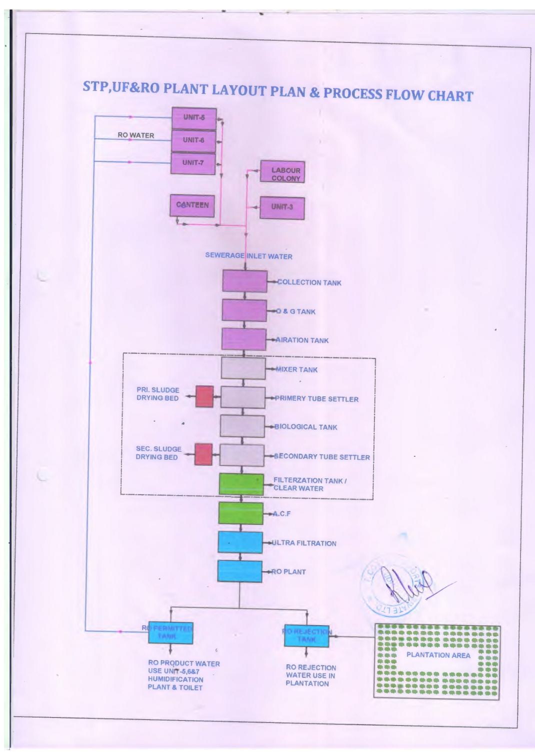
Flow Chart

Design Philosophy and Treatment Approach

The project design incorporates advanced physico-chemical and biological treatment processes, integrated with membrane filtration technologies (UF and RO). The treatment system is configured to achieve significant reductions in Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and suspended solids to meet the water quality requirements for industrial reuse.

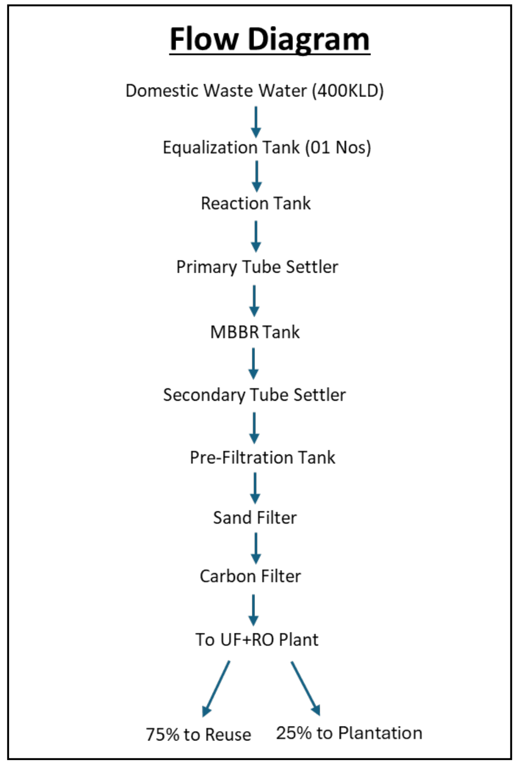
Treatment Process

The core treatment process of this wastewater recycling project is centered around advanced biological treatment using the Moving Bed Biofilm Reactor (MBBR) technology, followed by high-rate solid-liquid separation. In this design, the clarified effluent from the primary tube settler is conveyed to the MBBR tank, where biological degradation of organic pollutants occurs. MBBR technology utilizes specially designed plastic carriers, known as biofilm carriers or media, which provide a large surface area for microbial biofilm growth. These carriers are kept in continuous motion within the reactor by fine bubble diffusers placed at the bottom of the tank. The diffusers not only supply the necessary oxygen for aerobic biodegradation but also provide the mixing energy required to maintain the suspension of biofilm carriers, ensuring uniform contact between the wastewater and the



Project Flowchart

biofilm. The aerobic microorganism. The aerobic microorganisms growing on the biofilm carriers consume organic pollutants as a substrate, effectively reducing Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) by up to 90-95%.



Site Layout

The effluent from the MBBR tank flows through a sieving grid that retains the biofilm carriers within the reactor while allowing the treated water to pass to the secondary tube settler. This clarified effluent, with significantly reduced suspended solids, BOD, and COD concentrations, is then directed to the pre-filtration tank and subsequently pumped through a dual-stage filtration system. The first stage employs Dual Media Filters (DMF) comprising layers of sand and anthracite to remove fine suspended solids and colloidal particles, enhancing water clarity and protecting the downstream membrane units from fouling. The second stage utilizes Activated Carbon Filters (ACF), which adsorb residual organic compounds, color, and odor-causing substances, acting as a polishing step to ensure high-quality effluent. The treated water from the ACF is then fed to the Ultrafiltration system. The UF system is designed to remove remaining colloids, bacteria, and high molecular weight organics, serving as an effective pretreatment step for the RO system. This pretreatment significantly reduces membrane fouling in the RO unit. The RO system, designed for high recovery and sustainability, uses semi-permeable membranes housed in Fiber Reinforced Plastic (FRP) pressure vessels. The reject water, accounting for approximately 25% of the feed, is repurposed for plantation, and the rest 75% is repurposed for the process,

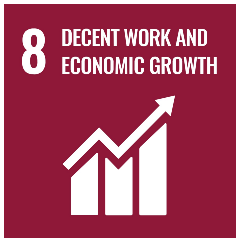
A.9. Implementation Benefits to Water Security

Overextraction of groundwater for intensive agriculture has led to a critical decline in water tables. According to the Central Ground Water Board, 79% of Punjab’s blocks are overexploited, leading to groundwater depletion at an alarming rate of 0.5 meters annually. Climate change exacerbates these challenges through erratic rainfall patterns and increased evaporation rates, heightening water scarcity risks.

The proposed wastewater recycling project in Punjab represents a significant step toward addressing the region’s water security challenges. By treating and reusing wastewater generated from industrial sources, this project reduces dependency on groundwater, thereby conserving a vital resource under severe stress. The project integrates advanced treatment technologies, including physico-chemical treatment, MBBR bioreactors, and membrane filtration systems like ultrafiltration (UF) and reverse osmosis (RO). These processes effectively eliminate contaminants, ensuring high-quality recycled water suitable for industrial reuse and non-potable applications such as landscaping and toilet flushing.

The wastewater recycling project contributes to multiple Sustainable Development Goals (SDGs),

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 4500 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.

A9.1 Objectives vs Outcomes

Objectives:

The primary objective of the wastewater recycling project at the industrial facility is to enhance water security by significantly reducing groundwater abstraction through the implementation of advanced sewage treatment plants (STPs). The project aims to recycle wastewater generated from domestic and industrial processes using state-of-the-art treatment technologies, including physico-chemical treatment, MBBR bioreactors, adsorption, ultrafiltration (UF), and reverse osmosis (RO). By increasing the total STP capacity to 900 KLD and recycling treated water for non-potable applications within the plant, the project seeks to minimize the reliance on freshwater sources and contribute to sustainable water management practices. Furthermore, the project aims to demonstrate the economic and environmental viability of adopting high-efficiency water treatment systems, thereby encouraging other industries to implement similar solutions for resource conservation. An additional objective is to comply with stringent environmental regulations by achieving high reductions in BOD, COD, and suspended solids, ensuring that the treated effluent meets regulatory discharge standards. This contributes to environmental protection and safeguards local water bodies from contamination. The project also aims to optimize operational efficiency by utilizing high-recovery RO systems with vertical multistage pumps and FRP pressure vessels, thereby enhancing energy efficiency and reducing the overall environmental footprint of the wastewater treatment process.

Outcomes:

The implementation of the wastewater recycling project successfully achieved the desired outcomes by significantly reducing groundwater abstraction by 75-80%, thereby enhancing water security and contributing to sustainable water resource management. By recycling treated wastewater for non-potable applications, the project effectively offset the demand for freshwater, conserving valuable water resources and reducing the environmental impact of industrial water consumption. Additionally, the adoption of advanced treatment technologies, including MBBR bioreactors and high-recovery RO systems, resulted in a substantial reduction in BOD, COD, and suspended solids, ensuring compliance with environmental regulations and preventing water pollution. The high efficiency of the RO system and the strategic utilization of reject water for plantation further demonstrated the project's commitment to resource optimization and circular water management. The project also showcased the successful integration of sustainable practices within industrial operations, setting a benchmark for other industries to follow. By achieving operational efficiency and environmental sustainability, the project not only contributed to water security but also enhanced the industry's reputation as an environmentally responsible entity. Moreover, the project's success in demonstrating the economic viability of water recycling systems encouraged broader adoption of similar technologies, thereby supporting regional and national water conservation initiatives.

A9.2 Interventions by Project Owner / Proponent / Seller

The successful implementation of the wastewater recycling project at the industrial facility was achieved through strategic interventions by the project owner. These interventions played a pivotal role in optimizing water management, reducing environmental impact, and promoting sustainability. The key interventions are as follows:

1. **Comprehensive Planning and Design**
    - **Assessment of Wastewater Generation:** A detailed analysis of wastewater generation from domestic sources and the humidity plant was conducted to design an efficient treatment system. This included evaluating flow rates, contaminant levels (BOD, COD, suspended solids), and variability in wastewater composition.
    - **Custom-Tailored Design Approach:** The STPs at Unit 5 (500 KLD) and Unit 12 (400 KLD) were designed using advanced treatment technologies, including physico-chemical treatment, MBBR bioreactors, adsorption, ultrafiltration (UF), and high-recovery reverse osmosis (RO). This ensured maximum water recovery while achieving high-quality treated water suitable for non-potable applications.
    - **Integration of High-Efficiency Systems:** The project incorporated energy-efficient components such as vertical multistage pumps and FRP pressure vessels to minimize power consumption and operational costs.
2. **Sustainable Water Management Practices**
    - **Water Recycling and Reuse:** Treated wastewater was strategically recycled within the plant for non-potable uses, such as in the humidity plant and other industrial applications. This intervention reduced groundwater abstraction by 75-80%, contributing significantly to water security.
    - **Circular Water Management:** Reject water from the RO system was innovatively utilized for plantation purposes, showcasing a closed-loop approach to water management. This minimized waste generation and supported sustainable landscaping practices.

3. **Stakeholder Engagement and Capacity Building**

   - **Collaboration with Technology Providers:** The project owner collaborated with leading technology providers to ensure the deployment of best-in-class wastewater treatment solutions. This partnership facilitated the integration of cutting-edge technology for optimized performance.

   - **Training and Skill Development:** Comprehensive training sessions were conducted for the operational team to enhance their capacity in managing the advanced STP systems. This ensured efficient and reliable operation of the wastewater treatment units.

4. **Regulatory Compliance and Environmental Stewardship**

   - **Strict Adherence to Environmental Standards:** The project ensured compliance with stringent environmental regulations by achieving significant reductions in BOD, COD, and suspended solids, safeguarding local water bodies from contamination.

   - **Promotion of Best Practices:** By showcasing successful wastewater recycling and reuse, the project demonstrated the economic and environmental viability of advanced water treatment systems, encouraging wider adoption in the industry.

5. **Monitoring, Evaluation, and Continuous Improvement**

   - **Automated Monitoring Systems:** The project implemented real-time monitoring systems to track water quality parameters, system performance, and operational efficiency, ensuring optimal functioning of the treatment plants.

   - **Performance Evaluation and Feedback Mechanisms:** Regular assessments were conducted to evaluate the effectiveness of the STPs. Feedback mechanisms were established to incorporate stakeholder inputs and continuously improve the treatment processes.

6. **Community and Environmental Impact**

   - **Water Security and Conservation:** By reducing groundwater extraction and promoting water recycling, the project contributed to long-term water security for the community and the industry.

   - **Environmental Awareness and Advocacy:** The project showcased the potential of advanced wastewater treatment technologies to conserve natural resources, setting an example for other industries to implement sustainable practices.

   -

A.10. Feasibility Evaluation

The installed ETP and recycling systems by the PP are robust and can handle wastewater effluent fluctuations in load easily

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

a) Inundation of Habitated Land

The project helps prevent land inundation by efficiently managing wastewater through an advanced Effluent Treatment Plant (ETP) and evaporators, reducing uncontrolled discharge. In the absence of such systems, untreated industrial effluents could flood surrounding land areas, leading to soil contamination and loss of productive land. By implementing wastewater recycling, the project ensures that excess water is treated and reused rather than indiscriminately released, preventing potential habitat displacement and waterlogging in nearby settlements.

b) Creation of Water Logging and Vector Disease Prevention Mitigation

Uncontrolled discharge of industrial effluents and untreated sewage often leads to stagnant water accumulation, creating breeding grounds for mosquitoes and other disease-carrying vectors, which increase the risk of malaria, dengue, and other waterborne diseases. The project mitigates this risk by treating and reusing wastewater, ensuring that water does not stagnate in open areas. The use of high-recovery reverse osmosis (RO) and evaporators further ensures minimal residual wastewater, significantly reducing the chances of waterlogging and associated health hazards.

c) Deterioration of Quality of Groundwater

India faces severe groundwater depletion and contamination due to unregulated extraction and industrial pollution. In the absence of this project, the Project Proponent (ST COTTEX EXPORTS PRIVATE LIMITED) would have continued relying on groundwater, further depleting this critical resource. Additionally, untreated effluent discharge contributes to groundwater contamination, affecting both human consumption and agricultural productivity. By implementing a closed-loop water recycling system, the project reduces groundwater dependency, prevents pollutants from infiltrating aquifers, and supports long-term water sustainability in the region.

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 4500 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.

A.12. Recharge Aspects :

NA

A.13. Quantification Tools

Baseline scenario

The baseline scenario is the situation where, in the absence of the project activity, the PP would have implemented one or all of the below mentioned 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 treatment, recycling and reuse.

Hence the baseline scenario applicable is: “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. For conservative purposes, the working days or operational days have been assumed at 330 days in a year during the 1st monitoring period.

Year	STP outlet (KLD)	STP Reuse (KLD)	RoUs with Uncertainty Factor 0.98	Conservative Values (Rounded Down)
2018 – 19	31561	22445	21996.1	21996
2019 – 20	93406	65738	64423.24	64423
2020 – 21	97218	72304	70857.92	70857
2021 – 22	102557	72805	71348.9	71348
2022 – 23	131326	93784	91908.32	91908
2023 – 24	202776	152486	149436.3	149436

Total	**65884**	**479562**	**469970.8**	**4,69,970**

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

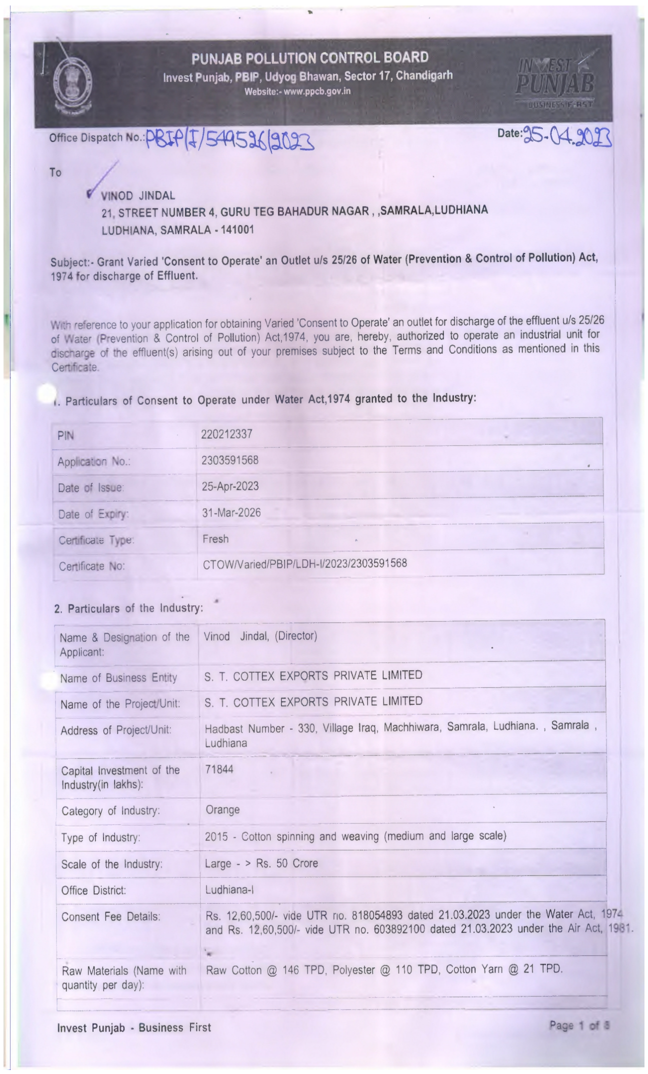
According to the UWR RoU Standard principles, the wastewater recycling project accomplishes the following:

1. **Increase Sustainable Water Yield:** The project activity significantly enhances sustainable water yield in the region by reducing dependence on groundwater sources. The installation of two advanced Sewage Treatment Plants (STPs) with a combined capacity of 900 KLD enables the recycling and reuse of treated wastewater for non-potable purposes, such as in the humidity plant and industrial applications. This intervention reduces groundwater abstraction by 75-80%, thereby conserving vital groundwater reserves and contributing to long-term water security. According to the Central Groundwater Board, groundwater exploitation is critically high in industrial regions, leading to aquifer depletion and water scarcity. By treating and reusing wastewater, the project minimizes the need for freshwater withdrawal, ensuring a sustainable water balance in the area. This initiative not only demonstrates responsible water management but also reduces the burden on local water resources, promoting ecological sustainability.

2. **Collect Unutilized Water or Rainwater from Entering Storm Drains or Sewers:** The project effectively prevents unutilized wastewater from being discharged into storm drains or sewers by implementing a closed-loop water management system. The state-of-the-art STPs are designed to treat 900 KLD of wastewater, ensuring that all effluents are processed and recycled within the facility.
   This approach not only prevents pollution of natural water bodies but also showcases an innovative method of capturing and reusing unutilized water resources. By integrating ultrafiltration (UF) and high-recovery reverse osmosis (RO) systems, the project maximizes water recovery, reducing wastewater discharge and enhancing resource efficiency.

3. **Conserve and Store Excess Water for Future Use:** The project activity conserves and stores excess treated water for future use, thus reducing reliance on external water sources. With the high-recovery RO system, the project achieves a recovery rate of approximately 75-80%, significantly conserving water resources. The stored treated water is strategically reused within the plant for non-potable purposes, ensuring its availability during periods of water scarcity. Additionally, the reject water from the RO process is utilized for plantation purposes within the facility, showcasing an innovative and sustainable approach to water management. This not only minimizes water wastage but also supports green landscaping, contributing to environmental sustainability.

4. **Enhance Local Women’s Participation and Professional Development:** The project promotes gender inclusivity and women’s empowerment by actively involving women in water management and operational roles. Through strategic capacity-building programs, the project provides skill development and employment opportunities for local women, enhancing their participation in sustainable water management practices.
Training sessions are conducted to equip women with technical knowledge about wastewater treatment processes, fostering their professional development in the water management sector. This empowerment initiative not only supports gender equality but also contributes to community well-being by creating livelihood opportunities.
By integrating social sustainability with environmental stewardship, the project sets an example of holistic community development, aligning with the UWR RoU Standard's principles of ethical and inclusive practices.



PUNJAB POLLUTION CONTROL BOARD
Invest Punjab, PBIP, Udyog Bhawan, Sector 17, Chandigarh
Website:- www.ppcb.gov.in

INVEST PUNJAB BUSINESS FIRST

Office Dispatch No.: PBIP/I/549526/2023 Date: 25-04.2023

To

VINOD JINDAL
21, STREET NUMBER 4, GURU TEG BAHADUR NAGAR , ,SAMRALA,LUDHIANA
LUDHIANA, SAMRALA - 141001

Subject:- Grant Varied 'Consent to Operate' an Outlet u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974 for discharge of Effluent.

With reference to your application for obtaining Varied 'Consent to Operate' an outlet for discharge of the effluent u/s 25/26 of Water (Prevention & Control of Pollution) Act,1974, you are, hereby, authorized to operate an industrial unit for discharge of the effluent(s) arising out of your premises subject to the Terms and Conditions as mentioned in this Certificate.

1. Particulars of Consent to Operate under Water Act,1974 granted to the Industry:

PIN	220212337
Application No.:	2303591568
Date of Issue:	25-Apr-2023
Date of Expiry:	31-Mar-2026
Certificate Type:	Fresh
Certificate No:	CTOW/Varied/PBIP/LDH-I/2023/2303591568

2. Particulars of the Industry:

Name & Designation of the Applicant:	Vinod Jindal, (Director)
Name of Business Entity	S. T. COTTEX EXPORTS PRIVATE LIMITED
Name of the Project/Unit:	S. T. COTTEX EXPORTS PRIVATE LIMITED
Address of Project/Unit:	Hadbast Number - 330, Village Iraq, Machhiwara, Samrala, Ludhiana. , Samrala , Ludhiana
Capital Investment of the Industry(in lakhs):	71844
Category of Industry:	Orange
Type of Industry:	2015 - Cotton spinning and weaving (medium and large scale)
Scale of the Industry:	Large - > Rs. 50 Crore
Office District:	Ludhiana-I
Consent Fee Details:	Rs. 12,60,500/- vide UTR no. 818054893 dated 21.03.2023 under the Water Act, 1974 and Rs. 12,60,500/- vide UTR no. 603892100 dated 21.03.2023 under the Air Act, 1981.
Raw Materials (Name with quantity per day):	Raw Cotton @ 146 TPD, Polyester @ 110 TPD, Cotton Yarn @ 21 TPD.

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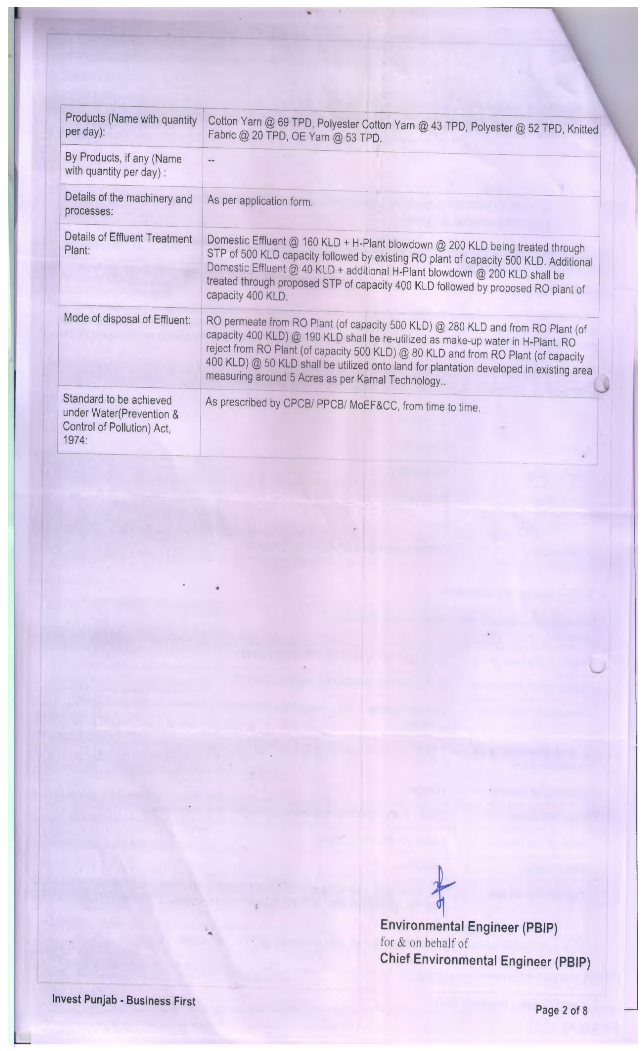

Products (Name with quantity per day):	Cotton Yarn @ 69 TPD, Polyester Cotton Yarn @ 43 TPD, Polyester @ 52 TPD, Knitted Fabric @ 20 TPD, OE Yarn @ 53 TPD.
By Products, if any (Name with quantity per day) :	--
Details of the machinery and processes:	As per application form.
Details of Effluent Treatment Plant:	Domestic Effluent @ 160 KLD + H-Plant blowdown @ 200 KLD being treated through STP of 500 KLD capacity followed by existing RO plant of capacity 500 KLD. Additional Domestic Effluent @ 40 KLD + additional H-Plant blowdown @ 200 KLD shall be treated through proposed STP of capacity 400 KLD followed by proposed RO plant of capacity 400 KLD.
Mode of disposal of Effluent:	RO permeate from RO Plant (of capacity 500 KLD) @ 280 KLD and from RO Plant (of capacity 400 KLD) @ 190 KLD shall be re-utilized as make-up water in H-Plant. RO reject from RO Plant (of capacity 500 KLD) @ 80 KLD and from RO Plant (of capacity 400 KLD) @ 50 KLD shall be utilized onto land for plantation developed in existing area measuring around 5 Acres as per Karnal Technology..
Standard to be achieved under Water(Prevention & Control of Pollution) Act, 1974:	As prescribed by CPCB/ PPCB/ MoEF&CC, from time to time.

Environmental Engineer (PBIP)
for & on behalf of
Chief Environmental Engineer (PBIP)

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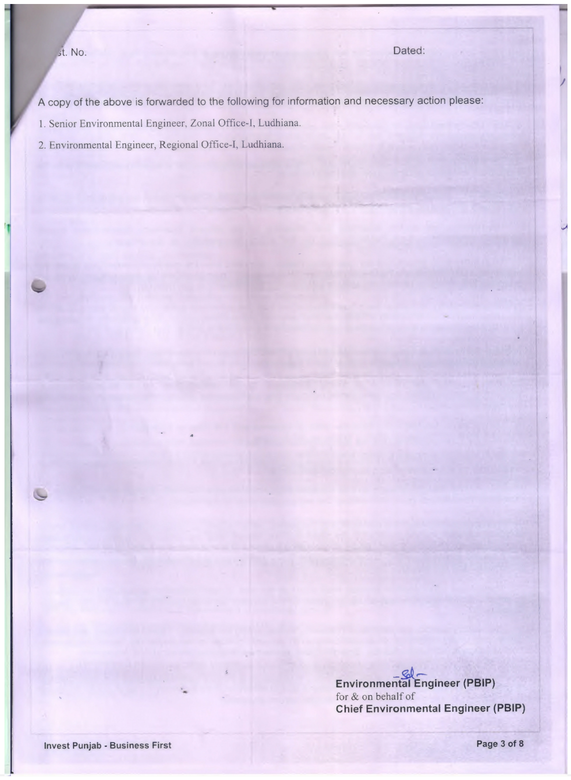

st. No. Dated:

A copy of the above is forwarded to the following for information and necessary action please:

1. Senior Environmental Engineer, Zonal Office-I, Ludhiana.
2. Environmental Engineer, Regional Office-I, Ludhiana.

-Sd-
Environmental Engineer (PBIP)
for & on behalf of
Chief Environmental Engineer (PBIP)

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

1. **Challenges in Scaling Wastewater Recycling Projects**

    - **Public Perception and Acceptance:** One of the major challenges faced in scaling wastewater recycling projects is public perception. In many regions, the notion of using treated wastewater for industrial or non-potable applications faces resistance due to misconceptions about safety and quality. Lessons from other projects indicate that effective communication strategies are crucial to changing public perception. Engaging stakeholders through awareness programs and transparent information dissemination can help build public trust and acceptance.

    - **Cost and Operational Challenges:** Initial capital investment and operational costs can be high for advanced wastewater recycling technologies such as ultrafiltration (UF) and reverse osmosis (RO). Additionally, maintenance of sophisticated systems requires skilled personnel, which can be a limiting factor for scaling up. Projects must explore cost-effective solutions, optimize operational efficiencies, and seek revenue from carbon credits or water credits to ensure financial sustainability.

    - **Regulatory and Policy Barriers:** Inconsistent regulations and lack of comprehensive policies for wastewater reuse can hinder project scaling. Coordinated efforts with regulatory authorities are necessary to establish clear guidelines that promote wastewater recycling while ensuring environmental safety.

2. **Lessons Learned from Project Implementation**

    - **Integration with Industrial Processes:** The success of the wastewater recycling project is largely attributed to its seamless integration with the existing industrial processes. By recycling treated water for non-potable applications like the humidity plant and plantation activities, the project effectively reduces groundwater abstraction by 75-80%. This approach highlights the importance of designing projects that align with the operational needs of industries, ensuring continuous demand and utilization of recycled water.

    - **High Efficiency and Sustainability through Advanced Technologies:** The use of high-recovery RO systems and energy-efficient vertical multistage pumps has demonstrated significant water conservation and energy savings. Implementing state-of-the-art technologies that enhance efficiency and sustainability is a key takeaway for scaling similar projects.

    - **Demonstrating Tangible Environmental and Economic Benefits:** The project's ability to significantly reduce BOD, COD, and suspended solids while ensuring cost savings from reduced groundwater usage has been instrumental in gaining stakeholder support. It underscores the importance of showcasing both environmental and economic benefits to drive acceptance and scalability.

3. **Restarting Projects and Overcoming Setbacks**

    - **Learning from Abandoned Initiatives:** In some instances, wastewater recycling projects are abandoned due to financial constraints, technical failures, or lack of public acceptance. However, with the availability of revenue from water credits (RoUs) under the UWR Program, previously abandoned projects can be revived. This financial mechanism provides a much-needed incentive for industries to voluntarily treat and reuse wastewater, ensuring long-term sustainability.

    - **Adapting to Changing Regulations and Market Dynamics:** The wastewater recycling industry is influenced by evolving regulations and market conditions. Projects must be agile in adapting to new policies, technological advancements, and changing stakeholder expectations. Revisiting and updating project designs to align with current standards is essential for restarting stalled projects.

    - **Building Resilience through Strategic Partnerships:** Collaboration with stakeholders, including government agencies, technology providers, and financial institutions, plays a vital role in restarting and scaling wastewater recycling projects. Strategic partnerships can provide access to funding, technical expertise, and policy support, ensuring resilience against future setbacks.

4. **Roadmap for Scaling and Expansion**

   - **Replicability and Standardization:** To achieve large-scale implementation, standardizing processes and replicating successful models in different industrial settings is crucial. The current project demonstrates a replicable model of wastewater recycling that can be adapted to various industries facing water scarcity challenges.

   - **Leveraging Carbon and Water Credits for Financial Viability:** The sale of water credits under the UWR Program presents an opportunity to create a revenue stream that supports scaling and expansion. This financial model incentivizes industries to adopt wastewater recycling practices, ensuring economic feasibility while contributing to environmental sustainability.

   - **Community Engagement and Awareness Building:** Public acceptance remains a challenge, especially in regions where recycled water usage is not culturally accepted. Building community awareness through targeted communication campaigns, stakeholder workshops, and transparent reporting of environmental and health benefits is critical for scaling up.

