MONITORING REPORT

CARBON OFFSET UNIT (CoU) PROJECT

Title: Wastewater Treatment and Biogas Recovery Project, SDDPL, Baramati, Maharashtra, India.

UCR PROJECT ID: 421

MR Version 1.0 MR Date: 06/04//2024

UCR Monitored Period: 01

Monitored Period Duration: 01/01/2014 to 31/12/2023 (10 Years, 00 Months)

1st Issuance period: 01/01/2014 to 31/12/2023 (10 Years, 00 Months)

1st Crediting period: 01/01/2014 to 31/12/2023 (10 Years, 00 Months)

	Monitoring Report (MR) **CARBON OFFSET UNIT (CoU) PROJECT**
BASIC INFORMATION	
Title of the project activity	Wastewater Treatment and Biogas Recovery Project, SDDPL, Baramati, Maharashtra, India.
Scale of the project activity	Small Scale
UCR PROJECT ID	421
Completion date of the MR	06/04/2024
Project participants	**Project Proponent**: Schreiber Dynamix Dairies Private Ltd. (SDDPL), Baramati, Maharashtra, India. **Aggregator**: Climekare Sustainability Pvt Ltd. **UCR ID:** 336812961
Host Party	India
Applied/Adapted methodologies and standardized baselines	**Adapted CDM UNFCCC Methodology Category** AMS III. H: Methodology for methane recovery in wastewater treatment. version 19 AMS-I.C: Methodology for Thermal energy production with orwithout electricity version 22 UCR Protocol Standard
Sectoral scopes	01 Energy industries (Renewable/NonRenewable Sources)
SDG Impacts	SDG 7 Affordable and Clean energy SDG 9: Industries, Innovation and Infrastructure SDG 12: Responsible Consumption & Production SDG 13 Climate Action SDG 15: Life on Land
Estimated total amount of average GHG emission reductions per year (DD/MM/YYYY: Quantity in CoUs)	01/01/2014 - 31/12/2014: 10,054 tCO_2 (10,054 CoUs)
	01/01/2015 - 31/12/2015: 11,989 tCO_2 (11,989 CoUs)
	01/01/2016 - 31/12/2016: 11,381 tCO_2 (11,381 CoUs)
	01/01/2017 - 31/12/2017: 13,289 tCO_2 (13,289 CoUs)
	01/01/2018 - 31/12/2018: 11,918 tCO_2 (11,918 CoUs)
	01/01/2019 - 31/12/2019: 6,901 tCO_2 (6,901 CoUs)
	01/01/2020 - 31/12/2020: 11,594 tCO_2 (11,594 CoUs)
	01/01/2021 - 31/12/2021: 13,848 tCO_2 (13,848 CoUs)
	01/01/2022 - 31/12/2022: 16,001 tCO_2 (16,001 CoUs)
	01/01/2023 - 31/12/2023: 16,817 tCO_2 (16,817 CoUs)
Estimated total amount of GHG emission reductions for the entire monitoring period (2014 - 2023)	**1,23,792 tCO_2 (1,23,792 CoUs)**

SECTION A. Description of project activity

A.1. Purpose and general description of Carbon offset Unit (CoU) project activity >>

The project **Wastewater Treatment and Biogas Recovery Project, SDDPL, Baramati, Maharashtra, India** is located in E-94, MIDC, Bhigwan Road, Baramati, District. Pune, State Maharashtra, Country India - 413133.

The details of the UCR project activity are as follows:

Purpose of the UCR project activity:
The project activity is a Wastewater Treatment and Biogas Recovery Project facility by the project proponent (PP), M/s. Schreiber Dynamix Dairies Pvt. Ltd., (SDDPL). The purpose of the project activity is to install anaerobic digesters for primary treatment of wastewater (namely Mother Liquor) and subsequently recovering methane rich biogas generated during the process. The recovered biogas is used in retrofitted boilers replacing equivalent quantity of FO (Furnace Oil). This will reduce carbon dioxide (CO_2) emissions into the atmosphere by reducing the amount FO burning in the boilers.

Schreiber Dynamix Dairies Pvt. Ltd., (SDDPL) a fully integrated dairy industry is located at Baramati in the state of Maharashtra, India. The daily processing capacity of plant is 800,000 - 1,600,000 liters of milk/day which is sourced from surrounding districts. It produces various dairy products through superior technology and process. The products include cheese, butter, ghee, casein, skimmed milk powder, dairy whitener, lactose, whey protein concentrate, whey powder and juices (milk and fruit) in aseptic packing.

The PP has full ownership of the project activity. This project is an operational activity with continuous reduction of GHGs, currently being applied under "Universal Carbon Registry" (UCR).

In June 2015, under Section 18 of the Companies Act 2013, Schreiber Dynamix Dairy Limited was changed into Schreiber Dynamix Dairy Private Limited (SDDPL).

While manufacturing of above products the wastewater is generated in two streams:

1. Wastewater generated through processing of milk, yogurt, and other dairy products
2. Wastewater generated from production of dairy products such as cheese and casein.

Pre-project activity scenario:

(i) Wastewater generated through processing of milk, yogurt, and other dairy products: This wastewater has the organic load, COD in the range of 3,500 mg/liter to 6,000 mg/liter and treated in the existing 4,500 m3/day Wastewater Treatment Plant (WWTP). The wastewater is treated with anaerobic as well as aerobic treatment. The biogas generated from anaerobic treatment through 5 nos. of anaerobic digesters is captured and flared in the atmosphere in the baseline scenario.

(ii) Wastewater generated from production of dairy products such as cheese and casein: This wastewater having the organic load, COD in the range of 250,000 mg/liter to 390,000 mg/liter and is treated in the existing anaerobic deep lagoons without methane recovery.

Project Activity scenario:

(i) Wastewater generated through processing of milk, yogurt and other dairy products will continue to be treated in the existing 4,500 m3/day Wastewater Treatment Plant (WWTP). The biogas generated from anaerobic treatment is captured and is used to fire in the retrofitted boilers with dual fuel burner.

(ii) The wastewater generated from production of dairy products such as cheese and casein. A by product called 'whey' is generated during manufacturing of these products. During Lactose recovery from whey, Mother Liquor (De-Lactose Permeate (DLP)) is generated. Mother liquor has a typical characteristic of 95.62% organic matter having organic load, COD in the range of 250,000 mg/liter to 390,000 mg/liter. This mother liquor is treated in a specially designed RCC constructed anaerobic treatment plant - Mother Liquor Treatment Plant (MLTP) with methane recovery.

(iii) Post recovery of methane, additional treatment on mother liquor is needed due to its high organic load. Therefore, it is further treated in the existing 4,500 m3/day WWTP. Outlets from MLTP get mixed with other stream of wastewater at equalization tank and treated in 4,500 m3/day WWTP.

(iv) The biogas generated from four anaerobic digesters of 4,500 m3/day WWTP, two anaerobic digesters of 45 m3/day MLTP will be captured and fired in the existing retrofitted boiler RFB 60, SM140.1 & SM140.2 (SM140.1 and SM140.2 which are stand-by boilers for RFB 60. The generated biogas is used exclusively in RFB-60 boiler.)

The purpose of the project activity is to install anaerobic digesters for primary treatment of this wastewater (namely Mother Liquor) and subsequently recovering methane rich biogas generated during the process at Schreiber Dynamix Dairies Pvt. Ltd. And the recovered biogas will be used in retrofitted boilers replacing equivalent quantity of FO (Furnace Oil).

The UCR project activity involves greenhouse gas emissions reduction through two methods:

1. Firstly, by directing the flow of Mother Liquor into closed anaerobic digesters, which prevents the release of methane (CH_4) into the atmosphere; and
2. secondly, by utilizing biogas generated from a 45 m3/day Mother Liquor Treatment Plant (MLTP) and an existing 4,500 m3/day Wastewater Treatment Plant (WWTP) in retrofitted boilers, replacing an equivalent quantity of Furnace Oil (FO) or Low Sulphur Heavy Stock (LSHS). This substitution reduces carbon dioxide (CO_2) emissions by decreasing the amount of FO burned in the boilers, thus contributing to overall emissions reduction.

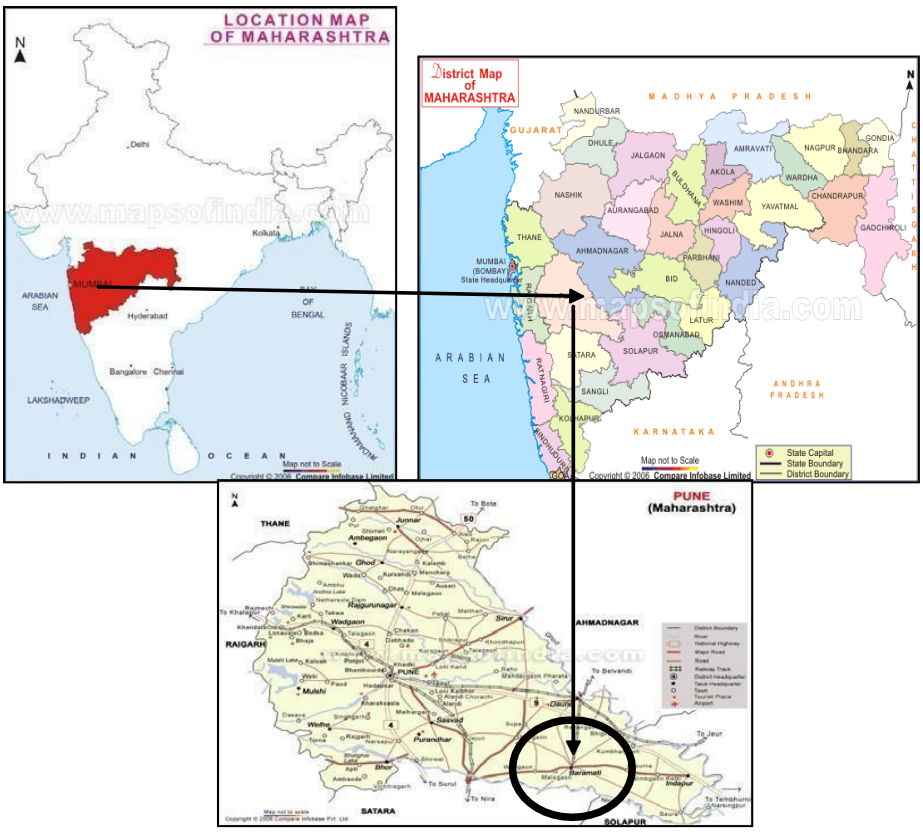
The UCR project activity qualifies under the environmental additional positive list of pre-approved project types under the UCR carbon incentive model for issuance of voluntary carbon credits.

UCR Monitoring Period Number	01
Start Date (DD/MM/YYYY)	01/01/2014
End Date (DD/MM/YYYY)	31/12/2023
Total Emission Reductions over the monitoring period (CoUs)	**1,23,792 tCO_2**

Location of project activity >>

Country	: India.
District	: Pune
Taluka	: Baramati
State	: Maharashtra
Pincode	: 413133
Latitude	: $18^0$11'24.16" N
Longitude	: $74^0$37' 06.04" E

The source of waste water for the proposed project activity is process units for the manufacturing of dairy products and other products at Schreiber Dynamix Dairies Pvt. Ltd.



Source: Google map

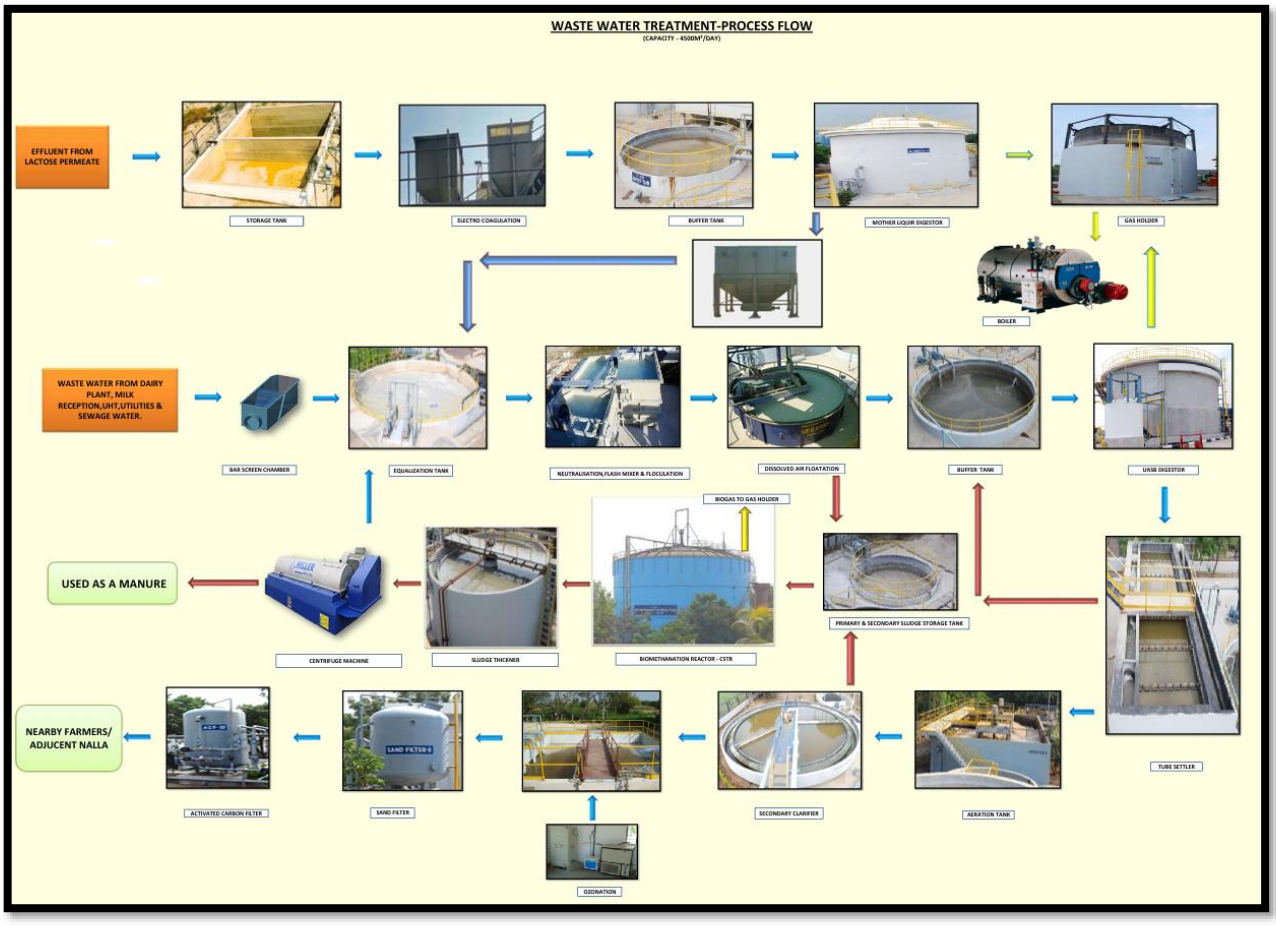
Biogas generation site.

Technologies/measures>>

The project activity involves treatment of mother liquor through following major stages:

1. Mother Liquor Treatment with anaerobic digesters.
2. Biogas Generation, Capture and Transfer to Boilers.
3. Utilization of biogas in boilers as a fuel for partial displacement of furnace oil.
4. Treatment on waste water generated from mother liquor treatment plant

Each of the above stages of the project activity is briefly explained below in the diagram:



Utilization of biogas in boilers for partial displacement of coal or furnace oil, insteam generation

1. **Dual Fuel Burner System**:
   - The pressurized biogas is received at a knock-out drum installed at the boiler house.
   - It is then fed to the boilers through a dual fuel burner system.
   - This system allows both fuels biogas and furnace oil (FO) to be fired simultaneously.
   - The quantities of each fuel are controlled during combustion.

2. **Burner Replacement**:
   - The old furnace oil-fired boiler burners have been replaced with advanced imported dual fuel burners.
   - These new burners are designed for combustion of both furnace oil and biogas in all the boilers.
   - The dual fuel burners feature a fully automated mechanism for precise monitoring and control of combustion parameters.

3. **Boiler Operation**:
   - RFB60 operates exclusively on biogas.
   - The steam generated from this biogas-fired boiler is fed to the plant.
   - SM140.1 and SM140.2 which are stand-by boilers for RFB 60.

4. **Reducing CO_2 Emissions**:
   - The steam generated through the biogas-fired boilers significantly reducesequivalent CO_2 emissions.
   - Without biogas utilization, this CO_2 would have been generated from the FO - fired boilers.
   - By using biogas, the total FO consumption is reduced drastically, resulting in substantial environmental benefits.

The project activity is generating steam for captive purposes using biogas from MLTP and WWTP with below details:

Technical details of the project activity

The waste water treatment system consists of the following equipment: Characteristics of the equipment installed:

Design basis for 45m^3/day mother liquor:

The design basis considered to size the various units for Mother Liquor treatment is as follows:

Characteristics	**Mother Liquor**
Total flow	45 m^3/day
COD	390,000 mg/liter
BOD	220,000 mg/liter
TSS	5 % (w/v)
pH	3 – 5.5

Technical specification of Stand-by boilers: (MR13343, MR13450)

Appliance	: Steam boiler
Type	: 3 pass, conventional, smoke tube type
Make	: Thermax Ltd.
Model	: SM 140 B
Sr. No.	: MR13343, MR13450
Steam generation capacity	: 13200 kg/hr (F&A 100^0C)
Designed pressure	: 23.5 kg/cm^2g
Design temperature	: 250.0^0C
Combustion air temperature	: Ambient
Present thermal efficiency considered	: 89% [6]@ NCV with economizer

Technical specification of boilers: (MR12342)

Appliance	: Steam boiler
Type	: 1 pass, conventional, smoke tube type
Make	: Thermax Ltd.
Model	: RFB60
Sr. No.	: MR 12342
Steam generation capacity	: 6000 kg/hr (F&A 100^0C)
Designed pressure	: 17.5 kg/cm^2g
Design temperature	: 207.0^0C
Combustion air temperature	: Ambient
Present thermal efficiency considered	: 89% [6]@ NCV with economizer

Type and Category:

According to the simplified modalities and procedures described in Appendix B for small-scale CDM project activities, the proposed project activity falls under the following:

Type	Category/Version	Sectoral Scope
III - Other project activities	III.H. Methane Recovery in Wastewater Treatment, version 19.	13
I - Renewable energy projects	I.C. Thermal energy production with or without electricity, version 22.	01

THERMAX LIMITED D-13, MIDC INDUSTRIAL AREA, R. D. AGA ROAD, CHINCHWAD, PUNE 411 019, INDIA □ TEL. : (020) 27475941 (5 LINES) □ FAX : (D) (020) 27477080, 27472049 □ Website : www.thermaxindia.com □ IT PAN - AAACT3910D

Cooling & Heating Division

THERMAX

Date of Report: 31/01/2014

Customer: M/S Schreiber Dynamix Dairy Ltd. Baramati

Purpose of Visit: Commissioning of Gas Conversion unit on RFB-60 Unit.

Customer Contact person:
Mr. Narayan Korde, Sachin Zadbuke (Maint.) & Mr. C. Bhagat (Safety)

Thermax Engineer: Mr. Amit Patil, Mr. Vijay Khawale, Mr. Varun Patil

Date of Visit: 29/01/2014 to 31/01/2014

Observations and activities:

1. Burner gun were received at site after repair, same was installed on unit and trial taken for firing on oil (100%) modulation from low to high.
2. Burner air setting kept suitable for single fuel either biogas (Fix 30% opening suitable for current flow of 150 Nm3/hour avg. gas) or FO (100 % modulation).
3. Unit load trail taken with available biogas flow for around 12 hrs on 29/01/2014 & 30/01/2014. Found maximum load were carried by unit is around 2.5 TPH
4. As per operations requirement the gas low pressure switch safety removed from safety circuit and provided control shutdown on gas pressure low. Thermax recommends providing the same with another pressure switch.
5. It was observed that after each stoppages or tripping incoming gas pressure increasing more than rated (As per P&I - 2000 mmWC), hence to complete commissioning trials Gas pressure High switch is bypassed and commissioning trials completed.
6. After fine tuning below parameters noted down for respective fuels.

Fuel	% opening	Burner inlet Pressure(Kg/Cm2)	Burner Return Pressure(Kg/Cm2)	Stack Temp. (degC)	O2 %	CO ppm
Bio Gas	30	400MMWC	NA	200	8	50
FO	40	15	6	226	5.	28

10. All safeties and interlocks were checked in presence of representative from Safety, Operation Departments of Schreiber Dynamix.
11. Gas Conversion Unit on RFB-60 commissioned successfully with existing set-up and handed over to customer for further use.

Recommendations to Customer:

1. Request to customer install PRV at the inlet of gas train to maintain incoming gas pressure within specified limit.
2. To switch the fuel firing from single fuel to combine fuel air settings on Modulation cam needs to be change.
3. Gas pressure high switch safety is bypassed to complete commissioning trials with the issue of inlet variable pressure to gas train. We request to customer do not run the unit in safety bypassed condition.

Customer Remark:

1. During techno-commercial discussions, SDDL has clearly mentioned the requirement that the burner should be fired & switched over smoothly on Single fuel as well as dual fuel. With existing setup for combined or single fuel other than the present operating, manual air setting needs to be done. This involves manual intervention and hence is not a smooth activity especially at the time of switching over. SDDL expects that Thermax will provide solution to ensure the smooth switching over.
2. Regarding point no. 5 in observations, SDDL is successfully operating similar dual fuel firing system with SM boilers where smooth modulation of gas flow is being achieved. This is because of Globe type PRV installed at the inlet of Gas Train. In this Gas Train, Butterfly type of PRV is provided, which is major cause of not attaining fine control on the gas pressure. SDDL requests to replace the Butterfly PRV with Globe type.

FOR SCHREIBER DYNAMIX DAIRIES LTD.	**FOR THERMAX LTD.**
MR. NARAYAN KORDE	**MR. AMIT PATIL**
MR. SACHIN ZADBUKE	**MR. VIJAY KHAWALE**
MR. C. BHAGAT	**MR. VARUN PATIL**

Schreiber Dynamix Dairies Ltd.

Projects/WWTP-Expn/09-10/002

Commissioning Certificate

This is to certify that,

Project Name	:	Installation of Biogas Generation Plant
Activity Name	:	Installation of Biogas Generation plant to generate biogas from De-lactose permeate (mother Liquor) and utilize it in boiler to generate steam
Section	:	WWTP
Job Code No	:	SU 09 Ana-1 : P02 Ana-2 : 12739
Start Date:	:	15th Sept 2008
Completion Date:	:	25th Sept 2009

has been commissioned.

Major Deliverables –

1) Installation of mother liquor pretreatment system – mother liquor heating and pH correction system
2) and Construction and installation of Anaerobic mother liquor treatment system – RCC digesters – 2nos, Recirculation system
3) Construction and installation of biogas collection system – Gas holder, Moisture traps and biogas flare.
4) Installation of biogas transfer system – Gas blowers, biogas transfer line.
5) Retrofitting of existing boilers – 2nos, (SM 140 B1 and SM 140 B2) for efficient burning of biogas in boilers to generate steam.
6) Interconnecting the plant with existing wastewater treatment plant for further treatment of wastewater generated from mother liquor.

Acceptance Criteria –

1) Treatment of mother liquor of quantity 36 m3/day.
2) Generation and utilization of biogas in the boiler.

User and Project Dept., agree that the Plant or above-named Section(s) (if applicable) has (have) attained the Performance Criteria specified in the Contract to be tested during Commissioning and that the Plant or Section (s) serves its (serve their) basic intended purpose as specified in the Contract.

The undersigned herewith confirm that **"Installation of Biogas Generation Plant"** Project with all accessories is installed as per requirements is accepted as fully commissioned.

Hemant Chavan	Shivaji Dhumal	Jitendra Jadhav
Manager - Utilities & Maint.	Manager - Engg & Projects	General Manager - Projects

SCHREIBER

Regd. Off: A 306/307, Dynasty Business Park, 58, Andheri Kurla Road, Andheri (E), Mumbai - 400 059, India. Tel: +91 22 6771 1900 / 01 • Fax: +91 22 6771 1910 / 11
Email: info@dynamixdairy.com
Factory: E-94, MIDC, Bhigwan Road, Baramati 413 133, Dist. Pune, Maharashtra
Tel: +91 2112 243821 / 22 / 23 / 24 • Fax: +91 2112 243710

Dynamix

Date: 02/01/2015

COMPLETION REPORT

Client : **M/S. SCHREIBER DYNAMIX DAIRIES LTD., BARAMATI**

Project : WWTP-1500 m3/day capacity for Sahara Project.

PO Nos : 24352 dated 05 Feb 2013 and 24384 dated 06 Feb 2013

SUPPLY, INSTALLATION AND PRE-COMMISSIONING of the Waste Water Treatment Plant (WWTP) Capacity-1500 m3/day have been completed successfully.

The following work has been completed in all respect regarding the installation, testing and commissioning of the WWTP.

1. UASB Reactor Internal Work
2. Biogas handling system comprising of Biogas Holder, Biogas Blowers, Foam trap, Sediment trap, Flame arrester & Biogas flare
3. Installation of DAF System
4. Pumps, Aerators, Agitators, Dosing Systems and Secondary Clarifier mechanism
5. PSF & ACF, Chlorine Dosing System
6. Piping, fittings and valves
7. Electrical & Instrumentation work
8. Pre commissioning
9. Seed sludge loading
10. Commissioning of all the mechanical items (Enclosed Annexure-1)
11. Biological pre-commissioning (Enclosed Annexure-2)

The WWTP Pre-commissioning work has been completed in the month of December 2014 and full load performance trial will be given when effluent as per designed quantity and parameters available at site.

For DILIGENT SOLUTIONS T. S. PVT. LTD

N. V. JOSHI
DIRECTOR

For SCHREIBER DYNAMIX DAIRIES LTD.

Madhukar S. Atole

P. Joshi

Diligent Solutions Technology Services Pvt. Ltd.
7, Chintamani Apts., Plot No. 16, Chintamani Society, S. No. 25/4, Karvenagar, Pune 411052.
Telefax : +91-20-25454446, 25444066 E-mail: ...

Annexure-I 7-Apr-14

Project : WWTP-1500 m3/day capacity for Sahara Project.
Following equipments & instruments has been erected & Installation done.

Sr.No.	Equipment Name	Remarks
1	UASB REACTOR FED PUMP -1 MAIN	FOUND SATISFACTORY
2	UASB REACTOR FED PUMP -2 STANDBY	FOUND SATISFACTORY
3	AERATOR IN AERATION TANK	FOUND SATISFACTORY
4	HIGH PRESSURE PUMP - 1 MAIN	FOUND SATISFACTORY
5	HIGH PRESSURE PUMP - 2 STANDBY	FOUND SATISFACTORY
6	DAF FEED PUMP - 1 MAIN	FOUND SATISFACTORY
7	DAF FEED PUMP - 2 STANDBY	FOUND SATISFACTORY
8	PSF FEED PUMP - 1 MAIN	FOUND SATISFACTORY
9	PSF FEED PUMP - 2 STANDBY	FOUND SATISFACTORY
10	PSF FEED PUMP - 3	FOUND SATISFACTORY
11	DAF SYSTEM	FOUND SATISFACTORY
12	AGITATOR FOR SLUDGE SUMP	FOUND SATISFACTORY
13	SLUDGE RECYCLE PUMP - 1 MAIN	FOUND SATISFACTORY
14	SLUDGE RECYCLE PUMP - 2 STANDBY	FOUND SATISFACTORY
15	DECAN TER FEED PUMP - 1 MAIN	FOUND SATISFACTORY
16	DECAN TER FEED PUMP - 2 STANDBY	FOUND SATISFACTORY
17	BIOGAS BLOWER 1 MAIN	FOUND SATISFACTORY
18	BIOGAS BLOWER - 2 STAND BY	FOUND SATISFACTORY
19	MIXER IN EQUALISATION TANK - 1	FOUND SATISFACTORY
20	MIXER IN EQUALISATION TANK - 2	FOUND SATISFACTORY
21	AIR COMPRESSOR	FOUND SATISFACTORY
22	SECONDARY CLARIFIER MECHANISM	FOUND SATISFACTORY
23	AGITATOR FOR ALUM DOSING TANK	FOUND SATISFACTORY
24	AGITATOR FOR POLY DOSING TANK	FOUND SATISFACTORY
25	AGITATOR FOR CAUSTIC DOSING TANK	FOUND SATISFACTORY
26	DOSING PUMP FOR ALUM DOSING - 1 MAIN	FOUND SATISFACTORY
27	DOSING PUMP FOR ALUM DOSING - 2 STANDBY	FOUND SATISFACTORY
28	DOSING PUMP FOR POLY DOSING - 1 MAIN	FOUND SATISFACTORY
29	DOSING PUMP FOR POLY DOSING - 2 STANDBY	FOUND SATISFACTORY
30	DOSING PUMP FOR ACID DOSING - 1 MAIN	FOUND SATISFACTORY
31	DOSING PUMP FOR ACID DOSING - 2 STANDBY	FOUND SATISFACTORY
32	DOSING PUMP FOR LIME DOSING - 1 MAIN	FOUND SATISFACTORY
33	DOSING PUMP FOR LIME DOSING - 2 STANDBY	FOUND SATISFACTORY
34	LEVEL SWITCH FOR DAF FEED PUMPS	FOUND SATISFACTORY
35	LEVEL SWITCH FOR REACTOR FEED PUMPS	FOUND SATISFACTORY
36	LEVEL SWITCH FOR DECANTER FEED PUMPS	FOUND SATISFACTORY
37	LEVEL SWITCH FOR PSCF ACF FEED PUMPS	FOUND SATISFACTORY
38	LIMIT SWITCH FOR GAS HOLDER	FOUND SATISFACTORY
39	LIMIT SWITCH FOR GAS HOLDER	FOUND SATISFACTORY
40	LIQUID FLOW METER ON REACTOR FEED PUMP DISCHARGE LINE	FOUND SATISFACTORY
41	LIQUID FLOW METER ON DAF FEED PUMP DISCHARGE LINE	FOUND SATISFACTORY
42	pH CONTROLLER	FOUND SATISFACTORY
43	UASB SYSTEM - BOTTOM DISTRIBUTION, THREE PHASE	FOUND SATISFACTORY
44	SEPERATOR, BIOGAS COLLECTION SYSTEM	FOUND SATISFACTORY
45	BIOGAS HANDLING SYSTEM - FOAM TRAP, SEDIMENT TRAP	FOUND SATISFACTORY
46	FLAME ARRESTERS, BIOGAS FLARE, PVRV	FOUND SATISFACTORY
47	BIOGAS HOLDER AND ACCESSORIES, MANOMETER	FOUND SATISFACTORY
48	CLORINE PUMPS WORKING NEAR ACF & PSF	FOUND SATISFACTORY
49	CLORINE PUMPS STAND BY NEAR ACF & PSF	FOUND SATISFACTORY
50	PSF & ACF	FOUND SATISFACTORY
51	MCC panel & CABLING , LPBS	FOUND SATISFACTORY
52	PIPING, FITTING AND VALVES COMPLETE	FOUND SATISFACTORY
53	BIOGAS PIPING TO EXISTING BIOGAS HOLDER	FOUND SATISFACTORY

Diligent Solutions Technology Services Pvt. Ltd.
7, Chintamani Apts., Plot No. 16, Chintamani Society, S. No. 25/4, Karvenagar, Pune 411052
Teletax : +91-20-25454446, 25444066 E-mail : dstspune@vsnl.net.in

Schreiber Dynamix Dairies Ltd.

Projects/WWTP-Expn/09-10/002

Commissioning Certificate

This is to certify that,

Project Name	:	Wastewater Treatment Plant Capacity Expansion
Activity Name	:	Expansion of Wastewater Treatment Plant by 1,000 m^3/day to treat 3,000 m^3 wastewater per day
Section	:	WWTP
Job Code No	:	SU09 Ana_1 – P01 Ana_2 – 12740
Start Date:	:	15th Sept 2008
Completion Date:	:	15th Sept 2009

has been commissioned.

Major Deliverables –

1) Installation of wastewater pretreatment system – pH correction, flocculation and DAF unit.
2) Construction and installation of Anaerobic wastewater system – RCC digester, Tube settler, sludge sump
3) Construction and installation of secondary treatment system for wastewater – Aeration system, secondary clarifier.
4) Construction and installation of tertiary treatment system for wastewater – Ozonation system, Multi-grade filter.
5) Installation of sludge treatment system – sludge transfer system, centrifuges
6) Interconnecting the new plant with existing plant wastewater treatment plant.

Acceptance Criteria –

1) Treatment of wastewater of quantity 1,000 m3/day.
2) Treated water should meet pollution control board norms.

User and Project Dept., agree that the Plant or above-named Section(s) (if applicable) has (have) attained the Performance Criteria specified in the Contract to be tested during Commissioning and that the Plant or Section (s) serves its (serve their) basic intended purpose as specified in the Contract.

The undersigned herewith confirm that the **WWTP Expansion Project** with all accessories is installed as per requirements is accepted as fully commissioned.

Hemant Chavan	Shivaji Dhumal	Jitendra Jadhav
Manager - Utilities & Maint.	Manager - Engg & Projects	General Manager - Projects

SCHREIBER

Regd. Off: A 306/307, Dynasty Business Park, 58, Andheri Kurla Road, Andheri (E), Mumbai - 400 059, India. Tel: +91 22 6771 1000 / 01 • Fax: +91 22 6771 1010 / 11
Email: info@dynamixdairy.com
Factory: K-94, MIDC, Bhigwan Road, Baramati 413 133, Dist. Pune, Maharashtra
Tel: +91 2112 244821 / 22 / 23 / 24 • Fax: +91 2112 243710

Dynamix

Schreiber Dynamix Dairies Ltd.

Projects/WWTP-Expn/09-10/002

Commissioning Certificate

This is to certify that,

Project Name	:	Installation of Biogas Generation Plant
Activity Name	:	Installation of Biogas Generation plant to generate biogas from De-lactose permeate (mother Liquor) and utilize it in boiler to generate steam
Section	:	WWTP
Job Code No	:	SU 09 Ana-1 : P02 Ana-2 : 12739
Start Date:	:	15th Sept 2008
Completion Date:	:	25th Sept 2009

has been commissioned.

Major Deliverables –

1) Installation of mother liquor pretreatment system – mother liquor heating and pH correction system
2) and Construction and installation of Anaerobic mother liquor treatment system – RCC digesters – 2nos, Recirculation system
3) Construction and installation of biogas collection system – Gas holder, Moisture traps and biogas flare.
4) Installation of biogas transfer system – Gas blowers, biogas transfer line.
5) Retrofitting of existing boilers – 2nos, (SM 140 B1 and SM 140 B2) for efficient burning of biogas in boilers to generate steam.
6) Interconnecting the plant with existing wastewater treatment plant for further treatment of wastewater generated from mother liquor.

Acceptance Criteria –

1) Treatment of mother liquor of quantity 36 m3/day.
2) Generation and utilization of biogas in the boiler.

User and Project Dept., agree that the Plant or above-named Section(s) (if applicable) has (have) attained the Performance Criteria specified in the Contract to be tested during Commissioning and that the Plant or Section (s) serves its (serve their) basic intended purpose as specified in the Contract.

The undersigned herewith confirm that **"Installation of Biogas Generation Plant"** Project with all accessories is installed as per requirements is accepted as fully commissioned.

Hemant Chavan	Shivaji Dhumal	Jitendra Jadhav
Manager - Utilities & Maint.	Manager - Engg & Projects	General Manager - Projects

SCHREIBER

Regd. Off: A 306/307, Dynasty Business Park, 58, Andheri Kurla Road, Andheri (E), Mumbai - 400 059, India. Tel: +91 22 6771 1900 - 01 • Fax: +91 22 6771 1910 / 11
Email: info@dynamixdairy.com

Factory: E-94, MIDC, Bhigwan Road, Baramati 413 133, Dist. Pune, Maharashtra
Tel: +91 2112 243821 / 22 / 23 / 24 • Fax: +91 2112 243710

Dynamix

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: http://mpcb.gov.in
Email: cac-cell@mpcb.gov.in

Kalpataru Point, 2nd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

RED/L.S.I (R16) **Date:** 08/07/2020
No:- Format1.0/CAC/UAN No.0000082260/CR - 2007000595

To,
Schreiber Dynamix Dairies Pvt. Ltd.
Plot No. E-94, MIDC, Bhigwan Road & Gat No. 88,89 & 91, 92 ,Rui,
Tal. - Baramati, Dist. - Pune. Maharashtra- 413133

Sub: **Renewal of existing Consent to Operate with amalgamation of Consent to Operate (Expansion) under RED category**

Ref:
1. Consent to Operate granted by the Board vide 1.0 / BO/CAC-Cell/ UAN No.: - 0000028681-17/CAC- 1710000619 dated 17/10/2017 valid up to 31.12.2019.
2. Consent to operate granted by the Board vide BO/CAC-CELL/CAC-UAN No. 59619 /CAC – 1906000759 dated 17.06. 2019 valid up to 31.12.2019.
3. The decision of CAC meeting dated 04.05.2020.

Your application No.MPCB-CONSENT-0000082260 Dated 05.11.2019

For: grant of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. **The consent to renewal is granted for a period up to 31/12/2024**
2. **The capital investment of the project is Rs.556.18 Crs. (As per C.A Certificate submitted by industry)**
3. **Consent is valid for the manufacture of:**

Sr No	Product	Maximum Quantity	UOM
Products			
1	Milk Powders + Baby food+ Whey Powder	1800	MT/M
2	Ghee	1087	MT/M
3	Butter	1478	MT/M
4	Lactose	340	MT/M
5	Casein	300	MT/M
6	Cheese	1200	MT/M
7	Flavored Milk - UHT	1000	MT/M
8	White Milk - UHT	3000	MT/M

Sr No	Product	Maximum Quantity	UOM
9	Fruit Juice - UHT	7500	MT/M
10	UHT - Liquid ORS	3850	MT/M
11	UHT - Oats Milk Dairy Products	692	MT/M
12	UHT- High Viscous Products	1750	MT/M
13	Lassi	100	MT/M
14	Dahi	350	MT/M
15	Yoghurt	600	MT/M

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal Path
1.	Trade effluent	2658	As per Schedule-I	On land for gardening / irrigation.
2.	Domestic effluent	227	As per Schedule-I	On land for gardening / irrigation.

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Sr No.	Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	1	Bio mass Boiler [24 TPH]	1	As per Schedule -II
2	2	Boiler [24 TPH]	1	As per Schedule -II
3	3	Boilers [1,2,3]	1	As per Schedule -II
4	4	DG Set - (3 X 800 KVA)	1	As per Schedule -II
5	5	DG Set - (1 X 1500 KVA)	1	As per Schedule -II
6	6	Bio gas plant	1	As per Schedule -II
7	7	Mineral Dryer	1	As per Schedule -II
8	8	WPC Dryer	1	As per Schedule -II
9	9	Lactose No.1,2,3	1	As per Schedule -II
10	10	Casein no.1,2,3	1	As per Schedule -II

6. **Non-Hazardous Wastes:**

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
1	ETP Sludge	9	MT/Day	Landfill	Used as manure
2	Boiler Ash	25	MT/Day	Reuse/ landfill	Land Filling or will be utilized for manufacturing of construction materials like Brick, Cement & et

Do no harm or Impact test of the project activity>>

- **Project Objective:** The primary objective of this project is to treat wastewater, specifically the Mother Liquor, and recover methane-rich biogas during the treatment process. The biogas will replace an equivalent quantity of Furnace Oil (FO) in the boilers for steam generation

By implementing this project, Schreiber Dynamix Dairies Pvt Ltd aims to achieve environmental benefits, improve energy efficiency, and contribute to sustainable practices. The utilization of biogas as an alternative fuel source reduces greenhouse gas emissions and promotes cleaner energy production. Additionally, it facilitates the adoption of advanced technologies within the organizationand the broader community.

Social Well-Being: The project activity will create employment opportunities for both skilled and unskilled laborers involved in the operation and maintenance of the plant.

Economic Well-Being: The project activity aims to enhance the economic well-being of the local population by providing direct and indirect employment opportunities during the erection, commissioning, and subsequent operation and maintenance of the plant.

Environmental Well-Being: The project activity contributes to improving the local environment by effectively managing bad odors and proper disposal of wastewater. By avoiding direct release of mother liquor into the environment, it helps prevent public nuisance caused by flies and insects. Additionally, the project has both local and global environmental benefits. It reduces greenhouse gas emissions by avoiding methane release from wastewater and also decreases emissions of flue gases equivalent to the replaced fuel oil consumption in the boiler for steam generation. Overall, the project ensures environmental cleanliness through the treatment of COD-rich mother liquor.

Technological Well-Being: The project involves treating Mother Liquor and recovering biogas, which will be utilized in boilers for steam generation, displacing an equivalent amount of fuel oil consumption. By promoting such advanced technologies, the project facilitates their adoption in the region and the country. Furthermore, it provides an opportunity for SDDL employees to learn about and work with cutting-edge mother liquor treatment systems.

United Nations Sustainable Development Goals:

The project activity is for primary treatment of waste water (namely Mother Liquor) and subsequently recovering methane rich biogas generated during the process at Schreiber Dynamix Dairies Pvt. Ltd. And the recovered biogas will be used in retrofitted boilers replacing equivalent quantity of FO (Furnace Oil).

Thus, the renewable energy generation from project activity will result in reduction of the greenhouse gas emissions. Positive contribution of the project to the following Sustainable Development Goals:

- SDG 7: Affordable and Clean Energy
- SDG 9: Industry, Innovation, and Infrastructure
- SDG12: Responsible Consumption and Production
- SDG13: Climate Action
- SDG15: Life on Land

Positive contribution of the project to the following **Sustainable Development Goals (SDG) outcomes:**

 SDG 7: Affordable and Clean Energy	Explanation: By utilizing biogas as a feed for boilers instead of furnace oil, the project contributes to ensuring access to affordable, reliable, sustainable, and modern energy for all, while also reducing greenhouse gas emissions and promotingcleaner energy sources.	SDG 7: Affordable and Clean Energy 7.1 : Ensure universal access to affordable, reliable, and modern energy services: By utilizing biogas from dairy processing, the project helps ensure affordable and sustainable energy access. 7.2 : Increase the share of renewable energy in the global energy mix: The project contributes to increasing the proportion of renewable energy sources in industrial energy consumption.
 SDG 9: Industry, Innovation, and Infrastructure	Explanation: The project represents an innovative approach to industrial energy usage by integrating renewable energy sources,promoting sustainable practices within the dairy processing industry, and enhancing infrastructure for cleaner energy production and consumption	SDG 9: Industry,Innovation, and Infrastructure. 9.4 : Upgrade infrastructure and retrofit industries to make them sustainable: Byintegrating biogas technology, the project upgrades infrastructure and promotes sustainable practices within the dairyindustry. 9.5 : Enhance scientific research and upgrade the technological capabilities of industrial sectors: The project demonstrates technological innovation by converting biogas into a viable alternative energy source for industrial boilers.

 SDG 12: Responsible Consumption and Production	Explanation: Converting biogas from dairy processing into a feed for boilers aligns with the goal of promoting sustainable consumption and production patterns by reducing reliance on fossil fuels, minimizing waste, and optimizing resource efficiency in the dairy industry.	SDG 12: Responsible Consumption and Production 12.2: Achieve sustainable management and efficient use of natural resources: By converting biogas into energy, the project promotesefficient resource management and reduces reliance on finite fossil fuel resources. 12.5: Substantially reduce waste generation through prevention, reduction, recycling, and reuse: The project minimizes waste by utilizing dairy byproducts to produce renewable energy instead of disposing of them as waste.
 SDG 13: Climate Action	Explanation: Utilizing biogas as a substitute for furnace oil in boilers helps mitigate climate change by reducing greenhouse gas emissions, particularly methane emissions from dairy waste, and promoting the transition towards low- carbon and resilient energy systems. Target: **1,23,792 tCO_2** = Quantity of tCO_2 reduced in this monitored period.	SDG 13: Climate Action 13.1: Strengthen resilience and adaptive capacity to climate-related disasters: By reducing greenhouse gas emissions, particularly methane from dairy waste, the project enhances resilience to climate changeimpacts. 13.2: Integrate climate change measures into national policies, strategies, and planning: The project aligns with national and global efforts to mitigate climate change by promoting the use of renewable energy sources.
 SDG 15: Life on Land	Explanation: By Implementing biogas technology in dairy processing, the project supports sustainable land use practices, reducespollution from agricultural activities, and contributes to biodiversity conservation by mitigating the environmental impacts associated with traditional fossil fuel usage.	SDG 15: Life on Land 15.1: Ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems: The project contributes tosustainable land use practices and reduces pollution from dairyprocessing activities. 15.3: Combat desertification, restore degraded land, and soil: By reducing methane emissions from dairy waste, the project helps mitigate land degradation and soil pollution associated with traditional waste disposal methods.

A.2. Parties and project participants>>

Party (Host)	Participants
India	**Project Proponent:** Schreiber Dynamix Dairies Private Ltd. E-94, MIDC, Bhigwan Road, Baramati, District. Pune, State Maharashtra,Country India – 413133 **Aggregator**: Climekare Sustainability Pvt Ltd. **UCR ID**: 336812961

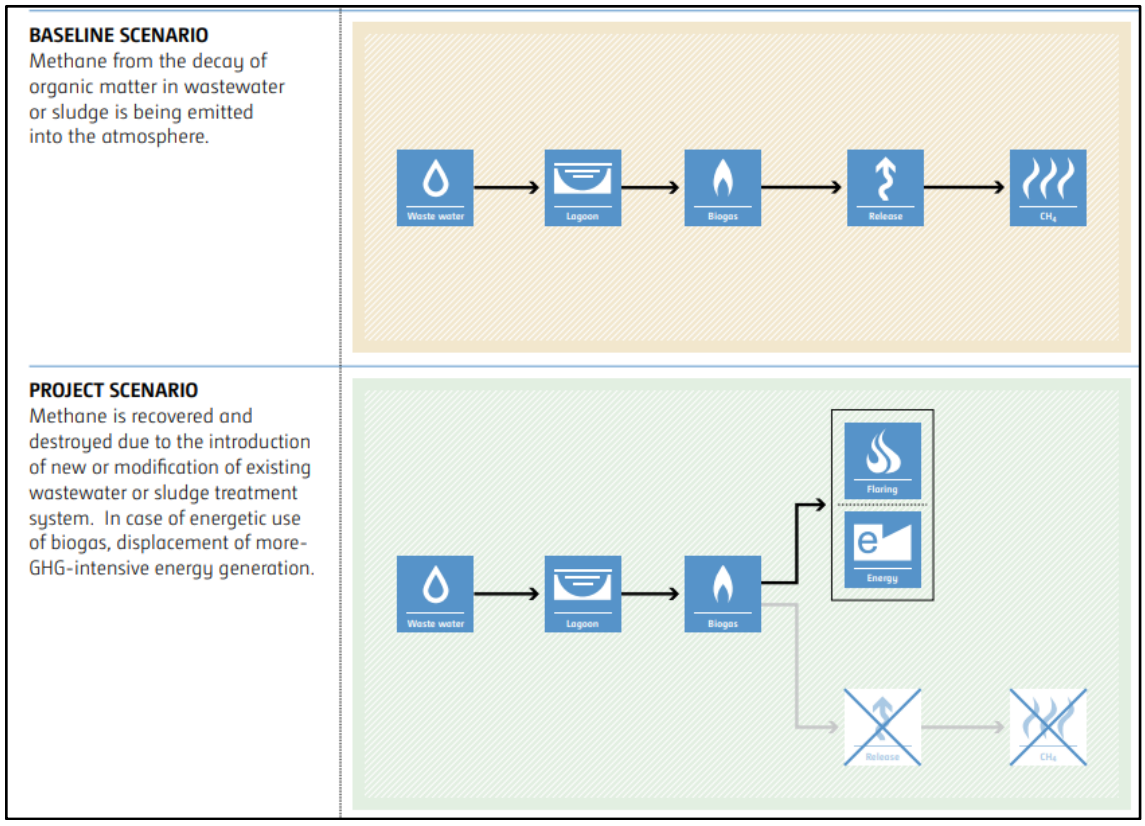
Project activity does not involve any public funding from Annex I Party, which leads to the diversion of the official development assistance.

A.3. Baseline Emissions>>

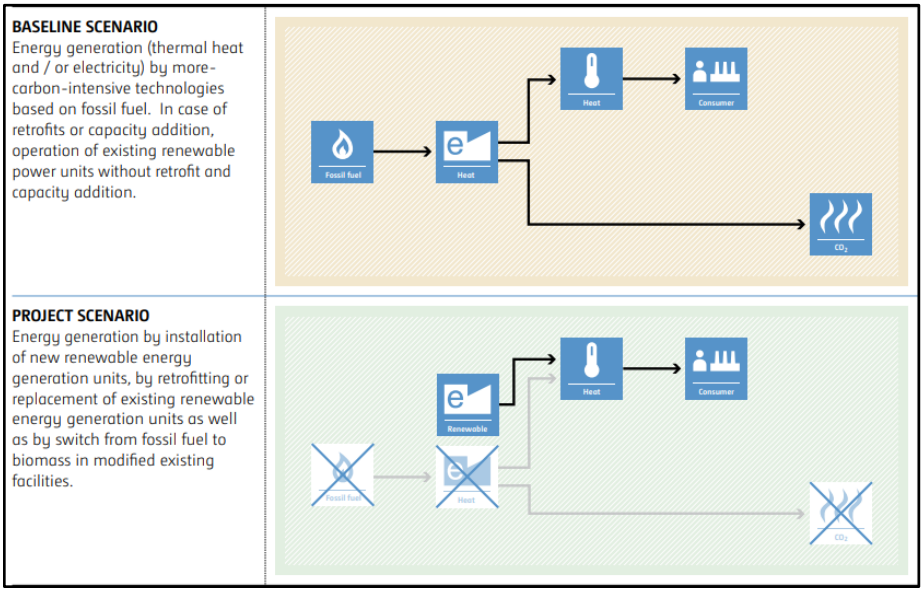
The baseline scenario identified at the MR stage of the project activity is:

- The situation where, in the absence of the project activity, methane from the decay of organic matter in wastewater or sludge is emitted to the atmosphere.
- Energy generation (thermal heat) by more carbon intensive technologies based on fossil fuel. In case of retrofits or capacity addition, operation of existing renewable power units without retrofit and capacity addition.

AMS-III.H. Methane recovery in wastewater treatment – version 19



AMS-I.C. Thermal energy production with or without electricity – version 22



Project Activity Overview: The project involves treating mother liquor in anaerobic digesters, which would otherwise continue to be treated in anaerobic deep lagoons without any biogas recovery. The biogas generated during the project activity will be utilized in the boiler, effectively replacing an equivalent quantity of Furnace Oil (FO).

Baseline Scenario: In the absence of this project, the baseline scenario would consist of the continued treatment of Mother Liquor in anaerobic deep lagoons without biogas recovery. Additionally, the corresponding quantity of FO would be consumed in the boiler to generate the required steam.

By implementing this project, PP aims to enhance environmental sustainability, energy efficiency, and reduce greenhouse gas emissions. The utilization of biogas as an alternative fuel source contributes to a cleaner and more efficient process.

A.4. Debundling>>

The project proponent confirms that there is no registered small-scale project activity registered within the previous two years with them in the same project category and technology, whose project boundary is within 1 km of the project boundary of the proposed small scale activity. Thus the proposed project activity is not a debundled component of any other large-scale project activity.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines >>

SECTORAL SCOPE - 13 Waste handling and disposal.

TYPE I - III - Other project activities.

CATEGORY - AMS-III.H. Methane Recovery in Wastewater Treatment, version 19.

SECTORAL SCOPE - 01 Energy Industries (Renewable / Non-renewal Sources)

TYPE I - Renewable Energy Projects

CATEGORY - AMS-I.C. Thermal energy production with / without electricity, version 22.

The project activity involves mother liquor treatment in anaerobic digesters that otherwise would continue to be treated in anaerobic deep lagoons without any biogas recovery. Generated biogas in the project activity is used in the boiler thereby replacing corresponding quantity of FO.

Hence, simplified baseline for the project activity is, continued treatment of Mother Liquor in anaerobic deep lagoons without biogas recovery and consumption of equivalent quantity of FO that otherwise would have been consumed in the boiler to generate corresponding quantity of steam.

B.2. Applicability of methodologies and standardized baselines>>

For AMS III.H. Version 19

Applicability Clause	Applicability Criteria	Project activity
2.1 - 2	This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options:	The methodology comprises measures that recover biogas from biogenic organic matter in the waste water (Mother Liquor composing of Carbohydrates, proteins & fat) by means of applicability criteria option (f).

2.1 –2 a)	Substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion.	This criterion is not applicable since the project activity involves replacement of existing anaerobic system.
2.1 – 2 b)	Introduction of anaerobic sludge treatment system with biogas recovery and combustion to a wastewater treatment plant without sludge treatment.	This criterion is not applicable since the project activity does not involve installation of anaerobic sludge treatment system.
2.1 – 2 c)	Introduction of biogas recovery and combustion to a sludge treatment system.	This criterion is not applicable since the project activity does not involve introduction of biogas recovery and combustion to an existing sludge treatment system.
2.1 – 2 d)	Introduction of biogas recovery and combustion to an anaerobic wastewater treatment system such as anaerobic reactor, lagoon, septic tank or an on site industrial plant.	This criterion is not applicable since the project activity does not involve introduction of biogas recovery to an existing treatment system i. e. anaerobic lagoon.
2.1 – 2 e)	Introduction of anaerobic wastewater treatment with biogas recovery and combustion, with or without anaerobic sludge treatment,to an untreated wastewater stream.	This criterion is not applicable since the project activity involves installation of Up flow Anaerobic Sludge Blanket digesters with methane recovery and combustion to a waste water stream which was previously treated in an existing anaerobic wastewater treatment system i.e., anaerobic lagoon.
2.1 – 2 f)	Introduction of a sequential stage of wastewater treatment with biogas recovery and combustion, with or without sludge treatment, to an anaerobic wastewater treatment system without biogas recovery (e.g. introduction of treatment in an anaerobic reactor with biogas recovery as a sequential treatment step for the wastewater that is presently being treated in an anaerobic lagoon without methane recovery).	This criterion is applicable since the project activity involves installation of Up flow Anaerobic Sludge Blanket digesters with methane recovery and combustion followed by further treatment in aerobic as well as anaerobic process.
2.2 – 3	In cases where baseline system is anaerobic lagoon the methodology is applicable if;	

2.2 – 3 a)	(a) The lagoons are ponds with a depth greater than two meters, without aeration. The value for depth is obtained from engineering design documents, or through direct measurement, or by dividing the surface area by the total volume. If the lagoon filling level varies seasonally, the average of the highest and lowest levels may be taken	The anaerobic lagoons are ponds with a depth greater than two meters, without aeration
2.2 – 3 b)	(b) Ambient temperature above 15°C, at least during part of the year, on a monthly average basis	Ambient temperature of the Project site is above 15Con a monthly average basis
2.2 – 3 c)	(c) The minimum interval between two consecutive sludge removal events shall be 30 days	The minimum interval between two consecutive sludge removal events is 30days
2.2 – 4	The recovered biogas from the above measures may also be utilized for the following applications instead of combustion/flaring.	
2.2 – 4 a)	Thermal or mechanical, electrical energy generation directly;	This criterion is applicable since the project activity involves utilization of recovered biogas for thermal energy generation directly in boilers for steam generation.
2.2 – 4 b)	Thermal or mechanical, electrical energy generation after bottling of upgraded biogas, in this case additional guidance provided in the appendix shall be followed;	This criterion is not applicable since the recovered biogas is utilized for thermal energy generation directly without bottling
2.2 – 4 c)	Thermal or mechanical, electrical energy generation after upgrading and distribution, in this case additional guidance provided in the appendix shall be followed: (i) Upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints; (ii) Upgrading and transportation of biogas via a dedicated piped network to a group of end users; or (iii) Upgrading and transportation of biogas (e.g. by trucks) to distribution points for end users;	This criterion is not applicable since the recovered biogas is utilized for thermal energy generation directly without upgrading and distribution. This criterion is not applicable since there is no upgrading and injection of biogas into a natural gas distribution grid. This criterion is not applicable since there is no up gradation and transportation of biogas via a dedicated piped network to a group of end users. This criterion is not applicable since there is no upgrading and transportation of biogas (e.g. by trucks) to distribution points for end users.

2.2 – 4 d)	Hydrogen production	This criterion is not applicable since there is no hydrogen production from the recovered biogas.
2.2 – 4 e)	Use as fuel in transportation applications after upgrading	This criterion is not applicable since biogas is not used as fuel in transportation applications after upgrading
2.2 – 5)	If the recovered biogas is used for project activities covered under paragraph 4(a), that component of the project activity can use a corresponding methodology under Type I.	The recovered biogas is used for thermal (steam) energy generation in project activities covered under paragraph 4 (a) and hence the project activity can use a corresponding methodology under Type I and the methodology AMS I.C. is used
2.2 – 6)	For project activities covered under paragraph 4 (b), if bottles with upgraded biogas are sold outside the project boundary, the end-use of the biogas shall be ensured via a contract between the bottled biogas vendor and the end-user. No emission reductions may be claimed from the displacement of fuels from the end use of bottled biogas in such situations. If however the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period CO2 emissions avoided by the displacement of fossil fuel can be claimed under the corresponding Type I methodology, e.g. AMS-I.C "Thermal energy production with or without electricity".	This criterion is not applicable since project activity is not covered under paragraph 4 (b).
2.2 – 7)	For project activities covered under paragraph 4 (c) (i), emission reductions from the displacement of the use of natural gas are eligible under this methodology, provided the geographical extent of the natural gas distribution grid is within the host country boundaries.	This criterion is not applicable since project activity is not covered under paragraph 4 (c) (i).
2.2 – 8)	For project activities covered under paragraph 4(c)(ii), emission reductions for the displacement of the use of fuels can be claimed following the provision in the corresponding Type I methodology, e.g. AMS-I.C.	This criterion is not applicable since project activity is not covered under paragraph 4 (c) (ii).

2.2 – 9)	In particular, for the case of paragraph 4(b) and (c)(iii), the physical leakage during storage and transportation of upgraded biogas, as well as the emissions from fossil fuel consumed by vehicles for transporting biogas shall be considered. Relevant procedures in paragraph 18 of the appendix of "AMS-III.H.: Methane recovery in wastewater treatment" shall be followed in this regard	This criterion is not applicable since project activity is not covered under paragraph 4 (b) and (c) (iii).
2.2 – 10)	For project activities covered under paragraph 4(b) and (c), this methodology is applicable if the upgraded methane content of the biogas is in accordance with relevant national regulations (where these exist) or, in the absence of national regulations, a minimum of 96 per cent (by volume)	This criterion is not applicable since project activity is not covered under paragraph 4 (b)and (c).
2.2 – 11)	If the recovered is utilized for the production of hydrogen (project activities covered under paragraph 3(d)), that component of the project activity shall use the corresponding methodology "AMS-III.O.: Hydrogen production using methane extracted from biogas".	This criterion is not applicable since the recovered biogas is not utilized for production of hydrogen.
2.2 – 12)	If the recovered biogas is used for project activities covered under paragraph 4(e), that component of the project activity shall use corresponding methodology "AMS-III.AQ.: Introduction of Bio-CNG in transportation applications".	This criterion is not applicable since the recovered biogas is not used for project activities covered under paragraph 4 (e).
2.2 – 13)	New facilities (Greenfield projects) and project activities involving a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system compared to the designed capacity of the baseline treatment system are only eligible to apply this methodology if they comply with the relevant requirements in the "General guidelines for SSC CDM methodologies". In addition, the requirements for demonstrating the remaining lifetime of the equipment replaced, as described in the general guidelines shall be followed.	The project activity is not a green field project and it does not involve any change of equipment resulting in a capacity addition of the wastewater treatment system compared to the designed capacity of the baseline treatment system.

2.2 – 14)	The location of the wastewater treatment plant shall be uniquely defined as well as the source generating the wastewater shall be uniquely defined and described in the PCN.	The location of the wastewater treatment plant is defined in PCN. The source generating the wastewater is process units for manufacturing of dairy products and other products at SDDPL is defined in PCN
2.2 – 15)	Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO2 equivalent annually from all Type III components of the project activity.	The project activity will result in emission reduction of 12,000 tCO2 annually which is less than 60 kt CO2 equivalent annually

For AMS I.C. Version 22

Applicability Clause	**Applicability Criteria**	**Project activity**
2.2 – 3)	Biomass-based cogeneration and tri-generation systems are included in this category.	The project activity does not involve biomass based cogeneration system and hence this criterion is not applicable.
2.2 – 4)	Emission reductions from a biomass cogeneration or tri-generation system can accrue from one of the following activities: (a) Electricity supply to a grid; (b)Electricity and/or thermal energy production for on-site consumption or for consumption by other facilities; (c) Combination of (a) and (b).	The project activity does not involve biomass cogeneration and hence none of the activities is applicable.
2.2 – 5)	Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	The project activity involves retrofitting the existing facilities (Furnace Oil fired boilers) for renewable energy generation though firing biogas.
2.2 – 6)	In the case of new facilities (Greenfield projects) and project activities involving capacity additions the relevant requirements related to determination of baseline scenario provided in the "General guidelines for SSC CDM methodologies" for Type-II and Type-III Greenfield/capacity expansion project activities also apply.	The project activity does not involve capacity addition.
2.2 – 7)	The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal	The total installed/rated thermal energy generation capacity of the project equipment is 6.5 MW

2.2 – 8)	For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal (see paragraph 9 for the applicable limits for cogeneration project activities).	The Project activity is a co-fired system and the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel is 16.56 MW thermal and does not exceed 45 MW thermal.

2.2 – 9)	The following capacity limits apply for biomass cogeneration and tri-generation units: (a) If the emission reductions of the project activity are on account of thermal and electrical energy production, the total installed thermal and electrical energy generation capacity of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating the capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the installed capacity of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant); (b) If the emission reductions of the project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment shall not exceed 45 MW thermal; (c) If the emission reductions of the project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment shall not exceed 15 MW.	The project activity does not involve biomass co-generation and hence none ofthe activities is applicable.

2.2 – 10)	The capacity limits specified in paragraphs 7 to 9 above apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project shall comply with capacity limits specified in the paragraphs 7 to 9, and shall be physically distinct from the existing units	The project activity does not involve addition of renewable energy units at existing renewable energy facility.
2.2 – 11)	If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation.	The project activity does not involve solid biomass fuel (e.g. briquette).
2.2 – 12)	Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.	The project activity does not involve solid biomass fuel.
2.2 – 13)	If electricity and/or thermal energy produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.	The steam produced by the project activity is not delivered to a third party i.e. another facility or facilities within the project boundary.

2.2 – 14)	If the project activity recovers and utilizes biogas for producing electricity and/or thermal energy and applies this methodology on a standalone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions as per relevant procedures in the tool "Emissions from solid waste	The project activity recovers and utilizes biogas for heat production and type III component of a SSC methodology is considered i. e. AMS III.H.
	disposal sites" and/or "Project emissions from flaring". In the event that the biomass fuel (solid/liquid/gas) is sourced from an existing CDM project, then the emissions associated with the production of the fuel shall be accounted with that project.	
2.2 – 15)	If project equipment contains refrigerants, then the refrigerant used in the project case shall have no ozone depleting potential (ODP).	The project activity does not involve refrigerants and hence not applicable.
2.2 – 16)	Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources, provided: (a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or (b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology "AMS-III.K.: Avoidance of methane release from charcoal production by shifting from traditional open-ended methods to mechanized charcoaling process".	The project activity does not involve charcoal based biomass energy generation.

	Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.	
2.2 – 17)	In the case the project activities utilizes biomass, the "TOOL16: Project and leakage emissions from biomass" shall be applied to determine the relevant project emissions from the cultivation of biomass and the utilization of biomass or biomass residues.	The project activity does not utilize biomass.

B.3. Applicability of double counting emission reductions>>

The project activity has been registered as a CDM project activity (registration date of the project activity under CDM mechanism is 04/09/2012) in the past as follows:

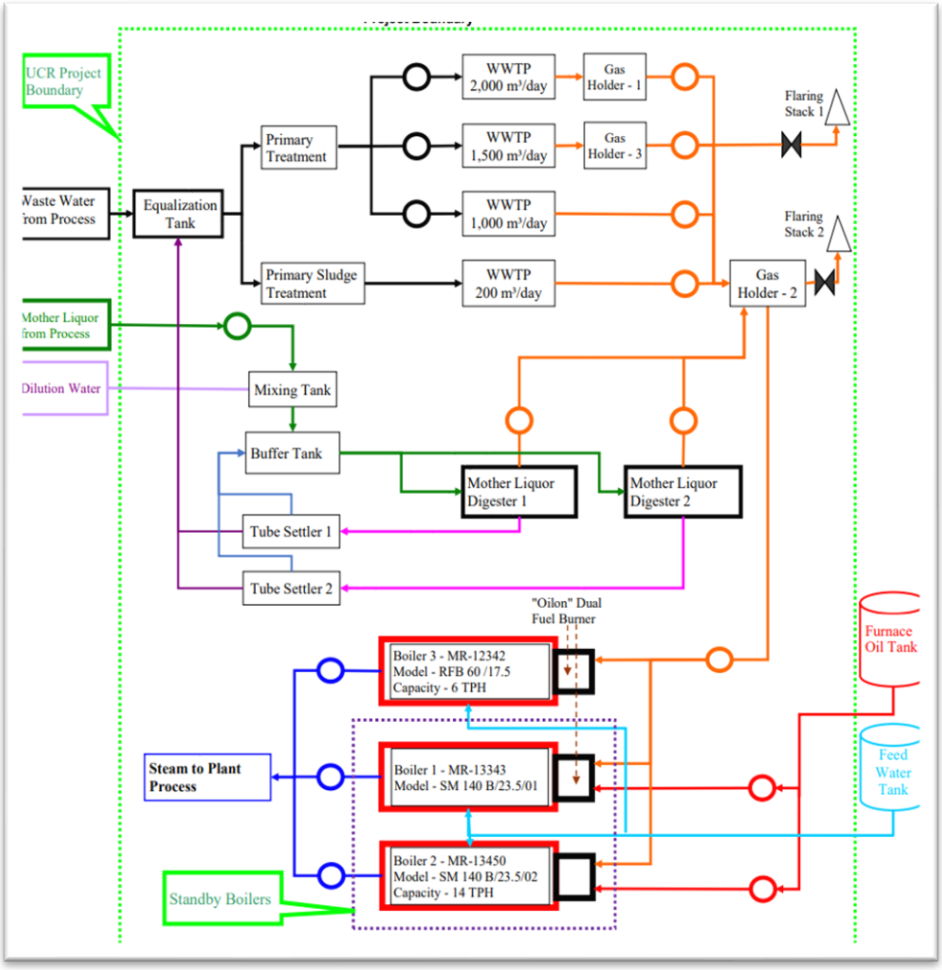
UNFCCC CDM Title	Waste water treatment and biogas recovery project	
CDM ID	2503	
Host Parties	Schreiber Dynamix Dairies Ltd.	
Sectoral Scopes	1: Energy industries (renewable - / non-renewable sources) 13: Waste handling and disposal	
Methodology	AMS-III.H. ver. 19 - Methane recovery in wastewater treatment AMS-I.C. ver. 22 - Thermal energy production with or without electricity	
Other Details	CDM Registration Date	04 Sep 12 (Date of registration action 15 Nov 12)
	Crediting Period	04 Sep 12 - 03 Sep 22 (Fixed)
Prior Issuance of CDM credits	Nil	

The project activity was registered under CDM under ID 2503 on 04 Sep 12 for the 04 Sep 12 - 03 Sep 22, however no CER's have been issued for the same. The project activity is now seeking CoUs under the UCR CoU Standard/Program for the period 01/01/2014 to 31/12/2023 and hence there is no double counting issue of carbon credits for the said vintage period. Additionally, the same has been stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by the PP.

B.4. Project boundary, sources and greenhousegases (GHGs)>>

The project boundary includes the physical, geographical site(s) of:

- where the wastewater and sludge treatment takes place, in the baseline and project situations. It covers all facilities affected by the project activity including sites where processing, transportation and application or disposal of waste products as well as biogas takes place.;
- All power plants generating power and/or heat located at the project site, whether fired with biomass, fossil fuels or a combination of both;



The following table summarizes the source and type of emissions associated with the projectactivity:

	Source	Gas	Included	Justification /Explanation
Baseline	**Combustion of FurnaceOil (FO) for steam generation**	CO_2	Included	Emissions due to Furnace oil combustion for the steam generation.
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
	Mother Liquor treatmentin Anaerobic Lagoon	CO_2	Excluded	Excluded for simplification
		CH_4	Included	Emissions due to mother liquor treatment in anaerobic lagoons
		N_2O	Excluded	Excluded for simplification
	Existing Waste watertreatment System	CO_2	Excluded	Excluded for simplification
		CH_4	Included	Emissions due to Waste water treatment.
		N_2O	Excluded	Excluded for simplification
Project activity	**Combustion of Furnace Oil(FO) for steam generation**	CO_2	Included	Emissions due to Furnace oil combustion for the steam generation.
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
	Electricity consumption	CO_2	Included	Emission due to electricity consumption in the project activity
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
	45 m^3/day Mother Liquor treatment system	CO_2	Excluded	Excluded for simplification
		CH_4	Included	Emissions due to mother liquor treatment
		N_2O	Excluded	Excluded for simplification
	4,500 m^3/day Wastewater treatment systems	CO_2	Excluded	Excluded for simplification
		CH_4	Included	Emissions due to affected part of waste watertreatment
		N_2O	Excluded	Excluded for simplification
	Biogas flaring system	CO_2	Excluded	Excluded for simplification
		CH_4	Included	Emissions due to inefficiency in the flaring system
		N_2O	Excluded	Excluded for simplification

Emission Reductions:

A. Baseline Emission (BEy)

Baseline emissions as per AMS III. H.

$$BE_y = \{BE_{power,y} + BE_{ww,treatment,y} + BE_{s,treatment,y} + BE_{ww,discharge,y} + BE_{s,final,y}\}$$

Where:

BE_y = Baseline emissions in year *y* (t CO_2e)

$BE_{power,y}$ = Baseline emissions from electricity or fuel consumption in year *y* (t CO_2e)

$BE_{ww,treatment,y}$ = Baseline emissions of the wastewater treatment systems affected by the project activity in year *y* (t CO_2e)

$BE_{s,treatment,y}$ = Baseline emissions of the sludge treatment systems affected by the project activity in year *y* (t CO_2e)

$BE_{ww,discharge,y}$ = Baseline methane emissions from degradable organic carbon in treated wastewater discharged into sea/river/lake in year y (t CO_2e). The value of this term is zero for the case 1(b)

$BE_{s,final,y}$ = Baseline methane emissions from anaerobic decay of the final sludge produced in year *y* (t CO_2e). If the sludge is controlled combusted, disposed in a landfill with biogas recovery, or used for soil application in the baseline scenario, this term shall be neglected

$$BE_{ww,treatment,y} = \sum_i (Q_{ww,i,y} * COD_{\inf low,i,y} * \eta_{COD,BL,i} * MCF_{ww,treatment,BL,i}) * B_{o,ww} * UF_{BL} * GWP_{CH4}$$

Parameter	Symbol	Unit
Volume of waste water treated	Qww,i,y	m^3/year
Quanity of ML entering Mother Liquor Treatment Plant		m^3/year
COD inlet to WW treatment		kg/year
COD inlet to WW treatment		kg/m3
COD inlet to WW treatment	CODinflow,i,y	t/m^3
COD removal efficiency of the baseline treatment system i	ηCOD,BL,y	
Methane correction factor for the existing wastewater treatment system	MCFww,treatment,BL,i	
Methane generation capacity of the wastewater	Bo,ww	kg CH_4/kg COD
Model correction factor	UFBL	
Global warming potential of methane	GWPCH_4	tCO2/tCH_4
Baseline emissions from the baseline waste water treatment system	BEww, treatment,y	tCO_2e/year

Baseline emissions as per AMS I. C.

$$BE_{thermal,CO2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$$

Parameter	Symbol	Unit
Total energy generation	EGthermal,y	TJ/year
Efficiency of the boiler	ηBL,thermal,y	%
Emission factor of FO	EFFF,CO2	tCO_2/TJ
Baseline emissions due to combustion of furnace oil	BEthermal,CO2,y	tCO_2e/year

Baseline emissions of the sludge treatment systems affected by the project activity:

As a conservative approach, baseline emissions from the sludge treatment systems have not been considered.

Baseline methane emissions on account of inefficiencies in the baseline wastewater treatment systems and presence of degradable organic carbon in the treated wastewater discharged into river/lake/sea:

Baseline emissions on account of inefficiencies in the baseline wastewater treatment systems and presence of degradable organic carbon in the treated wastewater are not considered as a conservative approach.

Baseline methane emissions from anaerobic decay of the final sludge

As a conservative approach, Methane emissions from anaerobic decay of the final sludge have not been considered in the baseline calculations.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Baseline emissions as per AMS III H	11125	12704	14310	14830	13740	13378	11994	14361	14988	15376
Baseline emissions as per AMS I C	1438	1739	1068	1329	1171	803	1430	1563	3304	3387
Total Baseline Emissions	12563	14443	15378	16159	14911	14181	13424	15924	18292	18763

B. Project Emissions (PEy)

Project emissions consists of:

CO_2 emissions from electricity and fuel used by the project facilities ($PE_{power,y}$);

Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery in the project scenario ($PE_{ww,treatment,y}$);

Methane emissions from sludge treatment systems affected by the project activity, and notequipped with biogas recovery in the project situation ($PE_{s,treatment,y}$);

Methane emissions on account of inefficiency of the project activity wastewater treatmentsystems and presence of degradable organic carbon in treated wastewater ($PE_{ww,discharge,y}$);

Methane emissions from the decay of the final sludge generated by the project activitytreatment systems ($PE_{s,final,y}$);

Methane fugitive emissions due to inefficiencies in capture systems ($PE_{fugitive,y}$); Methane

emissions due to incomplete flaring ($PE_{flaring,y}$);

Methane emissions from biomass stored under anaerobic conditions which would not haveoccurred in the baseline situation ($PE_{biomass,y}$).

$$PE_y = \left\{ \begin{array}{l} PE_{power,y} + PE_{ww,treatment,y} + PE_{s,treatment,y} + PE_{ww,discharge,y} + PE_{s,final,y} + \\ PE_{fugitive,y} + PE_{biomass,y} + PE_{flaring,y} \end{array} \right\}$$

Project Emissions as per AMS III.H.

$$PE_{power,y} = \sum_j EC_{PJ,j,y} * EF_{j,y} * (1 + TDL_{j,y})$$

In case of project activity, CO_2 emissions on account of power used by the project activity are from two different sources, regional electricity grid ($PE_{Grid,y}$) and off grid captive power plant i.e. diesel generator sets ($PE_{DG,y}$).

$$PE_{power,y} = PE_{Grid,y} + PE_{DG,y}$$

$$PE_{Grid,y} = EC_{PJ,Grid,y} * EF_{EL,Grid,y} * (1 + TDL_{Grid,y})$$

$$PE_{DG,y} = EC_{PJ,DG,y} * EF_{EL,DG,y} * (1 + TDL_{DG,y})$$

Methane emissions from wastewater treatment systems affected by the project activity and not equipped with biogas recovery in the project scenario ($PE_{ww,treatment,y}$),

Project activity will affect existing 4,500 m^3/day waste water treatment plant. These emissions shall be calculated as per AMS III.H. Version 19, using an uncertainty factor of 1.12 and data applicable to the project situation ($MCF_{ww,treatment,PJ,k}$ and$\eta PJ,k,y$):

$$PE_{ww,treatment,y} = \sum (Q_{ww,i,y} * COD_{inlow,i,y} * \eta_{PJ,k} * MCF_{ww,treatment,PJ,k}) * B_{o,ww} * UF_{PJ} * GWP_{CH4}$$

Volume of the waste water treated in the year	Qww,i,y	m^3/year
Inlet COD to the waste water treatment system	CODinflow,i,y	t/m^3
COD removal efficiency of the project treatment system i	ηPJ,k	%
Methane correction factor for project wastewater treatment system k	MCFww,teatment,PJ,k	
Methane producing capacity of the wastewater	Bo,ww	kg CH_4/kg COD
Model correction factor to account for model uncertainties	UFPJ	
Global Warming Potential for methane	GWPCH_4	tCO2/tCH_4
Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery, in year y	PEww,treatment,y	tCO2e/year

$$PE_{ww,discharge,y} = Q_{ww,y} * GWP_{CH4} * B_{o,ww} * UF_{PJ} * COD_{ww,discharge,PJ,y} * MCF_{ww,PJ,discharge}$$

Volume of the waste water treated in the year	Qww,y	m^3/year
Chemical oxygen demand of treated wastewater in the year	CODww,discharge,PJ,y	t/m^3
Methane generation capacity of the wastewater	Bo,ww	kg CH_4/kg COD
Methane correction factor based on type of treatment and discharge pathway of the wastewater	MCFww,PJ,discharge	
Model Correction factor to account for model uncertainities	UF_{PJ}	
Global warming potential of methane	GWPCH_4	tCO2/tCH_4
Methane emissions on account of inefficiency of the project activity wastewater treatment systems and presence of degradable organic carbon in treated wastewater	PEww,discharge,y	tCO2e/year

Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation ($PE_{s,treatment}$)

These project emissions are not considered as sludge treatment systems are not affected by the project activity.

Methane emissions from degradable organic carbon in treated wastewater in year y ($PE_{,ww, discharge,y}$)

These emissions shall be calculated as per AMS III.H using an uncertainty factor of 1.12 and data applicable to the project situation ($COD_{ww,discharge,PJ,y}$,$MCF_{ww,PJ,discharge}$)

Methane emissions from the decay of the final sludge generated by the project activity treatment systems ($PE_{s,final,y}$)

As explained above, if the sludge is controlled combusted, disposed in a landfill with biogas recovery, or used for soil application in aerobic conditions in the project activity, this term shall be neglected. Since the sludge generated in the project activity would be used for soil application, methane emissions from the decay of the sludge are neglected.

Methane fugitive emissions on account of inefficiencies in capture systems ($PE_{fugitive,y}$)

As per AMS III. H. version 19, project activity emissions form methane release in capture systems are determined as follows,

$$PE_{fugitive,y} = PE_{fugitive,ww,y} + PE_{fugitive,s,y}$$

$$PE_{fugitive,s,y} = 0$$

$$PE_{fugitive,ww,y} = (1 - CFE_{ww}) * MEP_{ww,treatment,y} * GWP_{CH4}$$

Capture efficiency of the biogas recovery equipment in the wastewater treatment systems	CFEww	
Methane emission potential of wastewater treatment systems equipped with biogas recovery system in year y	MEPww,treatment,y	t
Volume of the ML treated in the year	Qww,y	m^3/year
methane generation capacity of the wastewater	Bo,ww	kg CH_4/kg COD
Model Correction factor to account for model uncertainities	UFPJ	
Global Warming Potential for methane	$GWPCH_4$	tCO_2/tCH_4
Chemical oxygen demand removed by the treatment system k (45 m3 Mother Liquor Treatment Plant) of the project activity equipped with biogas recovery equipment in year y	CODremoved,PJ,k,y	t/m^3

Methane correction factor for the project wastewater treatment systems k equipped with biogas recovery equipment	MCFww,treatment,PJ,y	
Methane fugitive emissions on account of inefficiencies in capture systems in MLTP	PEfugitive,ww,y	tCO2e/year
For Waste Water Treatment Plant (WWTP):		
Capture efficiency of the biogas recovery equipment in the wastewater treatment systems	CFEww	
Methane emission potential of wastewater treatment systems equipped with biogas recovery system in year y	MEPww,treatment,y	t
Volume of the waste water treated in the year	Qww,y	m^3/year
Methane generation capacity of the wastewater	Bo,ww	kg CH_4/kg COD
Model Correction factor to account for model uncertainities	UFPJ	
Global Warming Potential for methane	GWPCH4	tCO2/tCH_4
Chemical oxygen demand removed by the treatment system k (120 m3 Mother Liquor Treatment Plant) of the project activity equipped with biogas recovery equipment in year y	CODremoved,PJ,k,y	t/m3
Methane correction factor for the project wastewater treatment systems k equipped with biogas recovery equipment	MCFww,treatment,PJ,y	
Methane fugitive emissions on account of inefficiencies in capture systems in WWTP	PEfugitive,ww,y	tCO2e/year
Methane fugitive emissions on account of inefficiencies in capture systems	PEfugitive,y	tCO2e/year

Methane emissions due to incomplete flaring in year y ($PE_{flaring,y}$)

In the project activity, generated biogas will be consumed in the heat generating equipment's (boilers). The project activity involves one heat generating equipment's (6TPH (F&A 100^0C) i.e. RFB-60 Boiler. When this boiler is forced shut down or is under maintenance, biogas can be supplied to another boilers (SM140.1 & SM140.2). It is very unlikely that both the heat generating equipment's are under maintenance or forced shut down.

However, if such condition occurs, the number of hours of operation of flare shall be monitored as H_{flare} and the quantity of biogas flared shall be obtained by multiplying the flare capacity and number of hours of operation of flare. The project activity involves open flaring system. This system is now not operational in and use of the same is very unlikely because the generated biogas will be used in the boilers. Hence, the default value to be adapted for flare efficiency is 0%.

Leakage ($LE_{ww,y}$) **:**

There is no transfer of equipment from another activity nor the existing equipment is transferred to another activity, hence there is no leakage has been considered for this project activity.

For Computation of Emission reductions based on ex post values for mother liquor treatment (under AMS III.H), conservative values shall be considered as per:

$$ER_{y,ex\ post} = \min((BE_{y,ex\ post} - PE_{y,ex\ post} - LE_{y,ex\ post}),$$
$$(MD_y - PE_{power,y} - PE_{biomass,y} - LE_{y,ex\ post}))$$

Project Emissions as per AMS I. C.

CO_2 emission from onsite consumption of fossil fuels due to the project activity

$$PE_{FC,boiler,y} = (\sum_{FO} FC_{FO,bolier,y} \times COEF_{FO,y})$$

Quantity of Fossil fuel used in the project activity	FCFO,boiler,y	kg/year
Coefficient of emission factor	COEFFO,y	
NCV of FO	NCVFO,y	TJ/kg
Emission factor of FO	EFCO2,FO,y	tCO_2/TJ
CO2 emissions from on-site consumption of fossil fuels due to the project activity in year y	PEFC,boiler,y	$tCO_2/year$
Total Project emissions as per AMS I.C.		$tCO_2e/year$

'CO_2 emissions from electricity consumption by the project activity' will beconsidered and calculated as per AMS III.H. version 19 and are described above under $PE_{ww,y}$.

Total project emissions:

Therefore, Project emissions due to thermal energygeneration will be, $PE_{thermal,y} = PE_{FC,boiler,y}$

Leakage ($LE_{thermal,y}$) **:**

Leakage emissions are not considered since there is no transfer of equipment from another activity.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Project emissions as per AMS III.H.	2314	2405	2308	2372	2288	2088	1830	2076	2291	1946
Total Project emissions as per AMS I.C.	195	49	41	0	0	47	0	0	0	0
Total Project Emissions	**2509**	**2454**	**2349**	**2372**	**2288**	**2135**	**1830**	**2076**	**2291**	**1946**

B.5. Establishment and description of baseline scenario (UNFCCC CDM-UCR Protocol)>>

The baseline scenario identified at the MR stage of the project activity is:

The baseline of the project activity is identified as per paragraph 21, 22, 24, 25 & 26 of AMS III.H ver. 19. As per paragraph 24 AMS III. H ver.19, "Wastewater and sludge treatment systems equipped with a biogas recovery facility in the baseline shall be excluded from the baseline emission calculations." the existing WWTP is excluded from the baseline emission calculations.

Mother Liquor was treated in anaerobic lagoons which was not equipped with biogas recovery and hence, baseline emissions for the systems affected by the project activity are considered. The applicable Methane equipped Correction Factor (MCF) will be determined based on the given table AMS III.H.2.
And baseline of the project activity is identified as per paragraph 63 of AMS I.C. Version 22 as, For project activities that seek to retrofit or modify an existing facility for the purpose of fuel switch from fossil fuels to biomass in heat generation equipment, the baseline emissions shall be calculated as per equation 2". The equation 3 refers to paragraph 34 of the methodology. Thus, paragraph 34 is identified as baseline scenario.

The project activity involves mother liquor treatment in anaerobic digesters that otherwise would continue to be treated in anaerobic deep lagoons without any biogas recovery. Generated biogas in the project activity shall be used in the boiler thereby replacing corresponding quantity of FO.

Hence, simplified baseline for the project activity is, continued treatment of Mother Liquor in anaerobic deep lagoons without biogas recovery and consumption of equivalent quantity of FOthat otherwise would have been consumed in the boiler to generate corresponding quantity of steam.

Emission Reductions (ER_y):

Therefore, total emission reduction because of this project activity is,

$ER_y = ER_{ww,y} + ER_{thermal,y}$

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ERww,y	8811	10299	10354	11960	10747	6145	10164	12285	12697	13430
ERthermal,y	1243	1690	1027	1329	1171	756	1430	1563	3304	3387
ERy	10054	11989	11381	13289	11918	6901	11594	13848	16001	16817
	1,23,792									

Total Emission Reductions (ER_y) = 1,23,792 CoUs (1,23,792 tCO_2eq)

B.6. Prior History>>

The project activity has been registered as a CDM project activity (registration date of the project activity under CDM mechanism is 04/09/2012) in the past as follows:

UNFCCC CDM Title	Waste water treatment and biogas recovery project	
CDM ID	2503	
Host Parties	Schreiber Dynamix Dairies Ltd.	
Sectoral Scopes	1: Energy industries (renewable - / non-renewable sources) 13: Waste handling and disposal	
Methodology	AMS-III.H. ver. 19 - Methane recovery in wastewater treatment AMS-I.C. ver. 22 - Thermal energy production with or without electricity	
Other Details	CDM Registration Date	04 Sep 12 (Date of registration action 15 Nov 12)
	Crediting Period	04 Sep 12 - 03 Sep 22 (Fixed)
Prior Issuance of CDM credits	Nil	

The project activity was registered under CDM under ID 2503 on 04 Sep 12 for the 04 Sep 12 - 03 Sep 22, however no CER's have been issued for the same. The project activity is now seeking CoUs under the UCR CoU Standard/Program for the period 01/01/2014 to 31/12/2023 and hence there is no double counting issue of carbon credits for the said vintage period. Additionally, the same has been stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by the PP.

Hence project will not cause double accounting of carbon offset units or credits (i.e., CoUs).

B.7. Changes to startdate of crediting period >>

There is no change in the start date of the crediting period.

B.8. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

There are no permanent changes from registered PCN monitoring plan and applied methodology.

B.9. Monitoring period number and duration>>

MR Version 1.0

UCR Monitored Period: 01 (Monitored Period Duration: 10 Years, 00 Months

1st UCR Monitoring Period: 01/01/2014 to 31/12/2023.

B.10. Monitoring Plan>>

1. Monitoring Plan Objective and Organization

The project activity will be operated and managed by the SDDPL. The plant will have a manual data recording system. In order to monitor and control the project performance, the PP will place a project management team. It will be coordinated by the Utility Manager, SDDL. He is also responsible for checking the information consistency. The PP will have well diversified procedure for collection of data and analysis of data at different levels and for subsequent corrective actions as when required inline with the internal quality systems.

The plant operation team will be entrusted with the responsibility of storing, recording the data related to the project activity. This team will be responsible for calculation of actual emission reduction in the most transparent and relevant manner and submit to the Utility Manager.

Data acquisition for the gas and wastewater flow meters will be executed through the process control unit of the biogas plant. Lab data will be recorded manually by the plant operation team.

Inspection and record of daily checklist of critical parameters of project activity will be maintained by Boiler shift operators / Chemist cum plant operators. The operators will access the condition of all the equipment and measuring equipment and appropriate corrective action will be taken. The meters which will be used in the project activity will be of reputed make with the best

accuracy available. All instruments will be calibrated and marked at regular intervals so that the accuracy of measurement can be ensured all the time. The calibration frequency for each instrument will be determined and documented and will also be a part of the monitoring and verification parameters. All the equipment's and meters will be calibrated as per the local/national standards or as per manufacturer's specifications. The equipment's and meters will be calibrated at appropriate intervals as per manufacturer's specifications or at least once in three years. The measured data without adequate calibration will be compared with local/national data and commercial data to ensure consistency. Calibration plan and process will be regularly audited during internal and external QMS audits.

All the monitoring data will be stored /will be recorded and scrutinized by Utility Manager and final monitored data kept in soft format as well as hard copies.

Parameters such as generated biogas, biogas fed to the boiler, steam generation from boiler etc. will be monitored continuously through meters. Electricity consumption from local grid as well as captive power plant will be measured and monitored through electronic meters.

The Instrumentation and control system for the project activity will be designed with adequate instruments to control and monitoring the various operating parameters for safe and efficient operations. All the instruments are of reputed make. The management of the plant has designated one person to be responsible for the collation of data as per the monitoring methodology. The designated person collects all data to be monitored as mentioned in this PCN and reports to the power plant manager.

Data / Parameter:	$Q_{ww,j,y}$
Data unit:	m^3/month
Description:	Volume of wastewater entering anaerobic digesters in Wastewater Treatment Plant
Source of data to be used:	Volume is measured using the volume flow meter and recorded in the plant log books.
Description of measurement methods and procedures to be applied:	Monitoring: Data is calculated based on cow water and mother liquor flows which are continuously measured with the help of volume flow meter along with the totalizer and the measured value is recorded in the log book hourly which is available for verification.
QA/QC procedures to be applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	Flow meter will be calibrated as per manufacturer's specification

Data / Parameter:	$Q_{ML,j,y}$
Data unit:	m^3/month
Description:	Volume of mother liquor entering anaerobic digesters in Mother Liquor Treatment Plant
Source of data to be used:	Volume is measured using the volume flow meter and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is continuously measured with the help of volume flow meter along with the totalizer and the measured value is recorded in the log book hourly which is available for verification.
QA/QC procedures to beapplied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	Flow meter will be calibrated as per manufacturer's specification

Data / Parameter:	$COD_{ww,inflow,MLTP,y}$
Data unit:	tCOD/m^3
Description:	The chemical oxygen demand of wastewater inflow at Mother Liquor Treatment Plant
Source of data to be used:	This data is determined by analytical titration method and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is determined by analytical titration method through representative sampling. The samples and measurements shall ensure a 90/10 confidence/precision level. Weighted average value will be used for emission reduction calculations.
QA/QC procedures to beapplied:	As per procedures based on national / international standards. Further values can be cross-checked from the third party laboratory reports.
Any comment:	-

Data / Parameter:	$COD_{ww,outflow,MLTP,y}$
Data unit:	tCOD/m^3
Description:	The chemical oxygen demand of wastewater outflow at Mother Liquor Treatment Plant
Source of data to be used:	This data is determined by analytical titration method and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is determined by analytical titration method through representative sampling. The samples and measurements shall ensure a 90/10 confidence/precision level. Weighted average value will be used for emission reduction calculations.
QA/QC procedures tobe applied:	As per procedures based on national / international standards. Further values can be cross-checked from the third party laboratory reports.
Any comment:	-

Data / Parameter:	$COD_{ww,removed,PJ,MLTP,y}$
Data unit:	tCOD/m^3
Description:	The chemical oxygen demand removed by the treatment system k (anaerobic digesters in mother liquor treatment plant) in project activity in year y
Source of data to be used:	COD value is calculated and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is calculated as follows, $COD_{ww,\text{inf } lowMLTP,y} - COD_{ww,outflow,MLTP,y}$ Weighted average value will be used for emission reduction calculations.
QA/QC procedures tobe applied:	As per procedures based on national / international standards. Further values can be cross-checked from the third party laboratory reports.
Any comment:	NA

Data / Parameter:	$COD_{ww,inflow,WWTP,y}$
Data unit:	tCOD/m^3
Description:	The chemical oxygen demand of wastewater inflow at anaerobic digesters of 4500 m^3/day Waste Water Treatment Plant in year y
Source of data to be used:	This data is determined by analytical titration method and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is determined by analytical titration method through Representative sampling. The samples and measurements shall ensure a 90/10 Confidence/precision level. Weighted average value will be used for emission reduction calculations.
QA/QC procedures to be applied:	As per procedures based on national / international standards. Further values can be cross-checked from the third party laboratory reports.
Any comment:	$COD_{ww,inf\ low,WWTP,y}$ = $COD_{inflow,i,y}$ in project scenario

Data / Parameter:	$COD_{ww,outoflw,WWTP,y}$
Data unit:	tCOD/m^3
Description:	The chemical oxygen demand of wastewater outflow at anaerobic digesters of 4500 m^3/day Waste Water Treatment Plant in year y
Source of data to be used:	This data is determined by analytical titration method and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is determined by analytical titration method through representative sampling. The samples and measurements shall ensure a 90/10 confidence/precision level. Weighted average value will be used for emission reduction calculations.
QA/QC procedures tobe applied:	As per procedures based on national / international standards. Further values can be cross-checked from the third party laboratory reports.
Any comment:	-

Data / Parameter:	$COD_{ww,removed,PJ,WWTP,y}$
Data unit:	tCOD/m^3
Description:	The chemical oxygen demand removed by the treatment system k (anaerobic digesters in 4500 m^3/day waste water treatment system) in project activity in year y
Source of data to be used:	COD value is calculated and recorded in the plant log books. Weighted average value will be used for emission reduction calculations.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is calculated as follows, $COD_{ww,inf\ low,WWTP,y}$ - $COD_{ww,toutflow,WWTP,y}$
QA/QC procedures tobe applied:	As per procedures based on national / international standards. Further values can be cross-checked from the third party laboratory reports.
Any comment:	NA

Data / Parameter:	$COD_{ww.discharge,PJ,y}$
Data unit:	tCOD/m^3
Description:	The Chemical oxygen demand of the treated wastewater discharged into sea, river or lake in the project situation in year y
Source of data to be used:	This data is determined by analytical titration method and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is determined by analytical titration method through representative sampling. The samples and measurements shall ensure a 90/10 confidence/precision level. Weighted average value will be used for emission reduction calculations.
QA/QC procedures tobe applied:	As per procedures based on national / international standards. Further values can be cross-checked from the third party laboratory reports.
Any comment:	-

Data / Parameter:	$_{PJ,k}$
Data unit:	%
Description:	The Chemical oxygen demand removal efficiency of the project wastewater treatment system *k* i. e. 4500 m^3/day waste water treatment plants in year *y*
Source of data to be used:	This is determined on based of inflow COD and outflow COD in system k i.e. 4500 m^3/day waste water treatment plants
Brief description of measurement methods and procedures to be applied:	Monitoring: calculated
QA/QC procedures to beapplied:	-
Any comment:	$_{PJ,k} = COD_{ww,inflow,i,y} - COD_{ww,inflow,WWTP,y}$ Calculated value based on inflow and outflow COD of wastewater entering 4500 m^3/day wastewater treatment plants

Data / Parameter:	$Q_{FF,FO}$
Data unit:	Tone's/year
Description:	Annual Furnace Oil consumption in the boiler RFB-60
Source of data to be used:	This data is measured using the mass flow meter and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Continuously. Data is measured by means of using mass flow meter and the measured value is totalized and recorded in the log book daily which is available for verification.
QA/QC procedures to beapplied:	The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. If invoices are available, the metered fuel consumption quantities should be cross-checked with available purchase invoices from the financial records.
Any comment:	Flow meter will be calibrated as per manufacturer's specification. $Q_{FF,FO1} = FC_{Fo,boiler,y}$

Data / Parameter:	$Q_{biogas,WWTP}$
Data unit:	m^3/year
Description:	Quantity of biogas generated from 4,500 m^3/day (From different stream) Waste Water Treatment Plantin year y.
Source of data to be used:	Biogas quantity is measured using the Volume flow meter with totalizer and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is continuously measured with the help of volume flow meter with totalizer and the measured value is recorded in the log book daily which is available for verification.
QA/QC procedures to beapplied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	Flow meter will be calibrated as per manufacturer's specification

Data / Parameter:	$Q_{biogas,MLTP1}$
Data unit:	m^3/year
Description:	Quantity of biogas generated by Mother liquor digester 1 in year y
Source of data to be used:	Biogas quantity is measured using the volume flow meter with totalizer and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is continuously measured with the help of volume flow meter with totalizer and the measured value is recorded in the log book daily which is available for verification.
QA/QC procedures to beapplied:	NA
Any comment:	Flow meter will be calibrated as per manufacturer's specification

Data / Parameter:	$Q_{biogas,MLTP2}$
Data unit:	m^3 /year
Description:	Quantity of biogas generated by Mother liquor digester 2 in year y
Source of data to be used:	Biogas quantity is measured using the volume flow meter with totalizer and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is continuously measured with the help of volume flow meter with totalizer and the measured value is recorded in the log book daily which is available for verification.
QA/QC procedures tobe applied:	NA
Any comment:	Flow meter will be calibrated as per manufacturer's specification

Data / Parameter:	$Q_{biogas,boiler}$
Data unit:	m^3/year
Description:	Quantity of biogas fired in the boiler RFB-60 in year y
Source of data to be used:	Biogas quantity is measured using the Volume flow meter with totalizer and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: At least hourly measurements will be undertaken, if less, confidence/precision level of 90/10 would be attained. Data will be measured with the help of volume flow meter with totalizer and the measured value is recorded in the log book daily which is available for verification.
QA/QC procedures to beapplied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	Flow meter will be calibrated as per manufacturer's specification. Cross check – The emission reductions are calculated based on energy output hence, the consistency of measurements ex post will be checked with annual data on energy generation, fossil fuels and biomass used and the efficiency of energy generation as determined ex ante.

Data / Parameter:	$W_{CH4,y}$
Unit:	%
Description:	Methane content in biogas in the year *y*
Source of data:	the data is based on external Lab report as per standard.
Brief description of measurement methods and procedures to be applied:	Monitoring: The fraction of methane in the gas will be measured and monitored based on the biogas sample sent to external Lab for analysis.
QA/QC procedures to be applied (if any):	As per external lab testing SOP.
Any comment:	NA

Data / Parameter:	NCV_{Biogas}
Data unit:	GJ/m^3
Description:	Heating value of unit quantity of biogas
Source of data to be used:	Laboratory reports
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is analyzed by a NABL accredited laboratory. The NCV shall be measured on dry basis. Analysis will be done quarterly, taking at least three samples for each measurement. The average value can be used for the rest of the crediting period. The result of measurement will be compared with measurements from previous years, relevant data sources (e. g. values in literature, national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, additional measurements shall be conducted.
QA/QC procedures tobe applied:	---
Any comment:	---

Data / Parameter:	Moisture
Data unit:	% water
Description:	Moisture content of the biogas
Source of data to be used:	Laboratory reports
Brief description of	Monitoring: Data is measured and recorded monthly. This data will be archived

measurement methods and procedures to be applied:	by Paper mode. The weighted average value shall be calculated for each monitoring period and used in the calculations.
QA/QC procedures to beapplied:	---
Any comment:	The data will be archived up to 2 years after the completion of crediting period or last issuance whichever is later.

Data / Parameter:	$FV_{RG,h}$
Data unit:	m^3/hour
Description:	Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h
Source of data to be used:	Biogas quantity is measured using the Volume flow meter with totalizer and recorded in the plant log books.
Brief description of measurement methods and procedures to be applied:	Monitoring: It will be ensured that the same basis (dry) is considered for this measurement and the measurement of volumetric fraction of all components in the residual gas ($fv_{i,h}$) when the residual gas temperature exceeds 60 ºC. Frequency: Continuously. Values to be averaged hourly or at a shorter time interval
QA/QC procedures to be applied:	QA/QC procedures as per ISO 22000:2018 to be implemented.
Any comment:	In the event of an emergency all the biogas generated will be sent to the flare for combustion. $FV_{RG,h} = Q_{biogas\ flaring}$

Data / Parameter:	Q_{Steam}
Data unit:	tone's/hour
Description:	Quantity of steam generated in the boiler RFB 60
Source of data to be used:	Plant records
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is Continuous monitored, integrated hourly and daily totalized recording with the help of calibrated meter which is available for verification. The meter shall be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated once in a three year.
QA/QC procedures to be applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	This will be totalized flow.

Data / Parameter:	Pr_{steam}
Data unit:	kg/cm^2 (g)
Description:	Saturated Steam pressure of boiler RFB 60
Source of data to be used:	Plant records
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is continuously measured, integrated hourly and daily totalized with the help of Pressure Transmitter and the measured value is recorded in the log book daily which is available for verification.
QA/QC procedures tobe applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	NA

Data / Parameter:	T_{steam}
Data unit:	^{o}C
Description:	Steam temperature of boiler RFB 60
Source of data to be used:	Plant records
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is continuously measured, integrated hourly and daily totalized recording with the help of temperature Transmitter and the measured value is recorded in the log book daily which is available for verification.
QA/QC procedures tobe applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	NA

Data / Parameter:	$T_{feed\ water}$
Data unit:	^{o}C
Description:	Feed water temperature of boiler RFB 60
Source of data to be used:	Plant records
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is continuously measured, integrated hourly and daily totalized recording with the help of temperature Transmitter and the measured value is recorded in the log book daily which is available for verification.
QA/QC procedures tobe applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	NA

Data / Parameter:	$EC_{PJ,Grid,y}$
Data unit:	MWh/year
Description:	Project activity electricity consumption from 132 KV sub-station electricity system
Source of data to be used:	Plant records
Brief description of measurement methods and procedures to be applied:	Monitoring: Energy meter reading at the boiler end, MLTP/WWTP end will be used to calculate the total project electricity consumption from regional electricity system.
QA/QC procedures tobe applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	NA

Data / Parameter:	$EF_{CO2,i,y}$
Data unit:	tCO_2/TJ
Description:	Weighted average CO_2 emission factor of fuel type i in year y
Source of data to be used:	The following data sources may be used if the relevant conditions apply:

Data source	Conditions for using
a) Value provided by the fuel supplier in invoices	This is the preferred source
b) Measurements by the Project participants	If, a) is not available
c) Regional of national default values	If, a) is not available These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as national energy balances)
d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If, a) is not available

Value of data:	For a) and b): Measurements should be undertaken in line with national or international fuel standards For a) and b): The CO_2 emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated. For c): Review appropriateness of the values annually For d): Any future revision of the IPCC Guidelines should be taken into account
Brief description of measurement methods and procedures to be applied:	--
QA/QC procedures to beapplied:	Applicable where Option B is used. For a): If the fuel supplier does provide the NCV value and the CO_2 emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO_2 factor should be used. If another source for the CO_2 emission factor is used or no CO_2 emission factor is provided, Options b), c) or d) should be used.
Any comment:	

Data / Parameter:	Hrs_{DG}
Data unit:	Hours
Description:	Annual running hours of the DG sets for power supply during grid failure to MLTP and WWTP
Source of data to be used:	Plant records
Value of data:	
Brief description of measurement methods and procedures to be applied:	Monitoring: Data will be recorded in hrs. manually
QA/QC procedures tobe applied:	---
Any comment:	This data will be archived up to 2 years after the completion of crediting period or last issuance whichever is later.

Data / Parameter:	$Q_{FF,Diesel}$
Data unit:	M^3
Description:	Annual Diesel consumption in the DG sets for power supply during grid failure
Source of data to be used:	This data is measured using volume flow meter and recorded in the plant log books.
Value of data:	
Brief description of measurement methods and procedures to be applied:	Monitoring: Data is measured by means of using volume flow meter in m^3/hr.
QA/QC procedures tobe applied:	NA
Any comment:	Flow meter will be calibrated as per manufacturers specification

Data / Parameter:	Q_{sludge}
Data unit:	tonnes/year
Description:	Quantity of sludge generation in year y
Source of data to be used:	Plant records
Value of data:	0
Brief description of measurement methods and procedures to be applied:	Monitoring: Weighing through weigh bridge.
QA/QC procedures tobe applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	$Q_{sludge} = S_{i,PJ,y}$

Data / Parameter:	$Q_{sludge\ disposal}$
Data unit:	tonnes/year
Description:	Quantity of sludge disposed in year y
Source of data to be used:	Plant records
Value of data:	0
Brief description of measurement methods and procedures to be applied:	The final sludge will be used for land application for bio-Maturing by local farmers. It will be provided free of cost to them. Monitoring: Through plant records
QA/QC procedures tobe applied:	QA/QC procedures as per ISO 22000:2018 to be implemented
Any comment:	Land application activity is carried out by farmers located in the vicinity of the project site. Sludge will be given free of cost to them.

Data / Parameter:	$BE_{y,ex\ post}$
Data unit:	tCO_2e/year
Description:	Baseline emissions calculated using ex post values in year y
Source of data to be used:	Plant records
Value of data:	0
Brief description of measurement methods and procedures to be applied:	Baseline emissions shall be calculated annually based on ex post values of other parameters and recorded in plant log books.
QA/QC procedures tobe applied:	---
Any comment:	

Data / Parameter:	$PE_{y,ex\ post}$
Data unit:	tCO_2e/year
Description:	Project emissions calculated using ex post values in year y
Source of data to be used:	Plant records
Value of data:	0
Brief description of measurement methods and procedures to be applied:	Project emissions shall be calculated annually based on ex post values of other parameters and recorded in plant log books.
QA/QC procedures tobe applied:	---
Any comment:	

Data / Parameter:	MD_y
Data unit:	tCO_2e/year
Description:	Methane captured and gainfully used by the project activity in the year *y*
Source of data to be used:	Plant records
Value of data:	31920
Brief description of measurement methods and procedures to be applied:	Date type: Calculated
QA/QC procedures tobe applied:	---