CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

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"Methane recovery and power generation in distillery plant" by Upper Ganges Sugar & industries Ltd, Seohara Distillery.

A.2. Description of the project activity:

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This project activity is based at the distillery unit of Upper Ganges Sugar & industries Ltd. here after UGSIL Seohara Distillery at Seohara Block of District Bijnor in the State of Uttar Pradesh. The company belongs to K. K. Birla Group. The distillery has implemented Integrated ISO 9001:2000 & ISO 14001:2004 system.

The installed capacity of distillery is 55 KLPD and will be operating on 100 KLPD from March' 2007. The raw material to the distillery is molasses from the sugar plant. The major products from the distillery are Rectified Spirit (RS), Ethanol and ENA. The plant is having zero pollution discharge.

The Spent-Wash generated from the distillery is high in Bio-chemical Oxygen Demand (BOD) / Chemical Oxygen Demand (COD) content. The approx. quantity of Spent-Wash generated from the process is ~700 m3 per day. The BOD level of the Spent-Wash is in the range 55000-60000 mg/l and the COD is in the range of 100000 -120000 mg/l. As per the norms of State Pollution Control Board and Central Pollution Control Board (CPCB) in India this high BOD/COD Spent-Wash cannot be discharged without proper treatment. The limit of BOD of the Spent-Wash for disposal in surface water is 30 mg/l and for disposal on land is 100 mg/l. CREP of 2003 introduced Zero discharge for distilleries from 2005. In normal course distilleries in India adopt open lagoons treatment system for meeting the pollution control standards of BOD/COD of the Spent-Wash. But in open lagoon system Methane, a potent GHG, is generated due to the anaerobic conditions, which escape into atmosphere, and there is no control or capturing involved.

This project activity from UGSIL Seohara Distillery entails treatment of this high BOD/COD Spent-Wash anaerobically in a closed digester and capturing the Methane generated in a controlled manner. The Methane captured is combusted in a boiler for steam generation and further to generate power through a turbo-generator. The project activity also includes combustion of other GHG neutral biomass residue fuels such as Bagasse and rice-husk to supplement biogas fuel in the boiler. The capacity of the power generation plant is ~3.0 MW.

The project is a small scale CDM project activity and is based on Appendix B of "Simplified Baseline and Monitoring Methodologies for Selected Small Scale CDM Project Activity Categories"

Sustainability aspects of the project activity:

This project activity carries a number of sustainability aspects. It helps in recovery of Methane, a potent Green House Gases (GHG) that in normal course is emitted in open atmosphere due to decomposition of high BOD/COD Spent-Wash of distillery effluent. The project activity helps in conservation of natural resources such as fossil fuels for its power requirement helping to some extent in national energy security. The project has also created employment opportunities both during erection & commissioning of the plant in the past and its operation and maintenance, currently. The introduction of the project activity would also encourage technology providers to further their efforts in R&D of wastewater treatment technologies bringing in investments.

K. K. Birla Group is known for its work for the community at large. Over the years K. K. Birla Group has helped the overall development of the region. Employment potential in rural areas has substantially increased throughout the year, avoiding migration of labour to other places for livelihood during lean seasons. The Group has also been carrying out its corporate social responsibilities with utmost priority. It has established a Foundation, a premier national body in the area of corporate social responsibility that has been actively involved in education, health, hygiene and rural empowerment.

A.3. Project participants:

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Upper Ganges Sugar & Industries Ltd.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

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A.4.1.1. Host Party(ies):

>>
India

A.4.1.2. Region/State/Province etc.:

>>
Uttar Pradesh

A.4.1.3. City/Town/Community etc:

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Seohara

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

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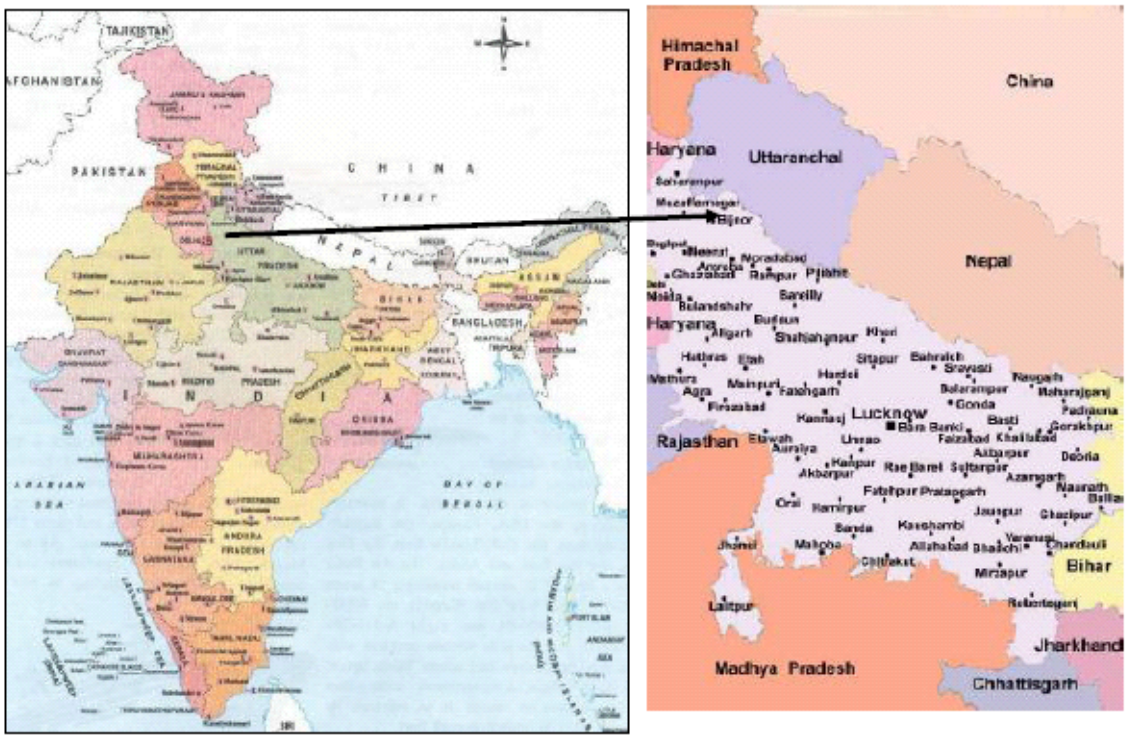
The plant is located at the Distillery Division of UGSIL Seohara Distillery at Block Seohara of Bijnor District in Uttar Pradesh, India. The plant site is about 260 km from the nearest airport of Delhi on State Highway No.49. The geographic location in which the project activity is located is depicted in the map below:



A.4.2. Category (ies) of project activity:

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The project is a small scale CDM project activity and is based on Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

The project activity has two parts and conforms to the following categories: -

TYPE IIIH: Methane Recovery in Wastewater Treatment:

This project category comprises measures that recover methane from biogenic organic matter in wastewaters by means of “Introduction of methane recovery and combustion to existing anaerobic wastewater or sludge treatment systems”.

TYPE I C: Thermal energy for user

This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal, and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least

one fossil fuel or nonrenewable biomass fired generating unit. The generation capacity should be less than 15 MW, which is ~3.0 MW in the project activity.

Sulzar process is being used for anaerobic digestion of the Spent-Wash in the project activity. Power generation is based on steam-power route.

A.4.3. Technology to be employed by the project activity:

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The project activity helps in GHG emission reduction in two ways: -

1. Methane emission reduction through its controlled recovery in an anaerobic digestion plant
2. Reduction of emissions from fossil fuel based diesel power by replacing with biogas and other biomass combustion in power generation plant

In the absence of the project activity the unit would have installed facilities to treat Spent-Wash in open lagoons and would not have captured the Methane. Also, it would have continued consuming diesel and furnace oil, which are primarily fossil fuel based and not taken up the biogas & biomass based power generation for meeting its electricity requirement.

The total of GHG emissions reduction from the project activity in tones of CO2 equivalent = 1216077.1 **tCO2e** over the fixed crediting period of 10 years.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

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Years	**Annual estimation of emission reductions in tones of CO2 e**
Year 2007	121607.71
Year 2008	121607.71
Year 2009	121607.71
Year 2010	121607.71
Year 2011	121607.71
Year 2012	121607.71
Year 2013	121607.71
Year 2014	121607.71
Year 2015	121607.71
Year 2016	121607.71
Total estimated reductions (Tones of CO2 e)	**1216077.1**
Total number of crediting years	10 years
Annual average over the crediting period of estimated reductions ((tonnes of CO2 e)	121607.71

A.4.4 Estimated amount of emission reductions over the chosen crediting period:

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The project is projected to reduce an average of **121607.71 tCO2e** annually, generating an expected total of **1216077.1 tCO2e** for the duration of the fixed 10-years crediting period.

A.4.5. Public funding of the project activity:

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No public funding from parties included in Annex I is available to the project activity.

As per Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project activities–

"A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- with the same project participants;
- in the same project category and technology/measure; and
- registered within the previous 2 years; and
- whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point"

The project activity is not a de-bundled component of a large project activity as – There is no small scale CDM project activity or an application registered by UGSIL Seohara Distillery in the same project category in the last two years within 1 km of the project boundary of the proposed small-scale project activity.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

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The project is a small scale CDM project activity and is based on Appendix B (Version No. 07 dated 28 November 2005) of the simplified modalities and procedures for small-scale CDM project activities. The project activity conforms to the following categories-

Category	Technology/ measure
TYPE IIIH: Methane Recovery in Wastewater Treatment Reference: **III.H. /Version 4,Scope 13, 15**	Comprises Methane recovery and combustion from wastewater treatment facilities.
TYPE I C: Thermal energy for user **I.C./Version 9,Scope 1**	This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal, and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel or non-renewable biomass fired generating unit. The generation capacity should be less than 15 MW, which is ~3.0 MW in the project activity.

B.2 Justification of the choice of the methodology and why it is applicable to the project activity:

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Category	Applicability Criteria	Project Status
TYPE IIIH: Methane Recovery in Wastewater Treatment	This project category comprises measures that recover methane from biogenic organic matter in wastewaters by means of "Introduction of methane recovery and combustion to existing anaerobic wastewater or sludge treatment systems."	The project activity entails recovery of methane generated in the spent-wash treatment facility of UGSIL Seohara Distillery.
Renewable Energy	This category comprises renewable	Use of methane and bio-solids

Projects – Type - I. C. - Thermal energy for the user - **Reference:** Latest amended version (3rd March 2006) of Appendix B to the simplified M&P for small-scale CDM project activities	energy technologies that supply individual households or users with thermal energy that displaces fossil fuels. Biomass-based co generating systems that produce heat and electricity for use on-site are included in this category.	for generation of energy (Cogeneration of steam and power)

B.3. Description of the sources and gases included in the project boundary

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	Source	Gas	Included?	Justification/Explanation
Base line	Direct emissions from the waste treatment processes.	CH4	Included	The major source of emissions in the baseline
		N2O	Excluded	Excluded for simplification. This is conservative.
		CO2	Excluded	CO2 emissions from the decomposition of organic waste are not accounted.
	Emissions from electricity Consumption n / generation	CO2	Included	Electricity may be consumed from the grid or generated onsite in the baseline scenario
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O.	Excluded	Excluded for simplification
	Emissions from thermal Energy generation	CO2	Included	Thermal energy generation is included in the project activity
		CH4	Excluded	Excluded for simplification. This is conservative
		N2O	Excluded.	Excluded for simplification. This is conservative.
Project Activity	Emissions from on-site Electricity use	CO2	Excluded	Electricity is generated from collected biogas; these emissions are not accounted for.
		CH4	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.

	Direct emissions from the Waste treatment processes.	N2O	Excluded	Excluded for simplification. Not and important emission source.
		CO2	Excluded.	CO2 emissions from the decomposition of organic waste are not accounted
		CH4	Included	The emission from uncombusted methane. For dewatering and land application, conservative estimates of methane are included.

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

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Baseline Scenario:

Since two project categories are applicable to the project, two different baseline scenarios have been identified that would have occurred in absence of the CDM project.

As per Type III H. Para 1(iii) Methane Recovery in Wastewater Treatment project category in UGSIL Seohara Distillery comprises measures that recover methane from biogenic organic matter in wastewaters by means of " Introduction of methane recovery and combustion to existing anaerobic wastewater or sludge treatment systems."

Baseline

The baseline scenario as per Type III H is the existing anaerobic wastewater treatment system without methane recovery for the case of introduction of a sequential anaerobic wastewater treatment system with methane recovery.

The baseline emissions scenario as per Type III H Para 6 (vi) will be

BEy = Qy,ww * CODy,ww,untreated * Bo,ww * MCFww,treatment * GWP_CH4

For the above case the methane generation capacity of the treated wastewater (Bo, ww) shall be IPCC lower value of 0.21 kg CH4/kg .COD.

Project Baseline scenario and baseline emissions:

UGSIL Seohara Distillery was operating a digester of capacity 700 KL/day (Digester #1) of old technology. Although wastewater treatment could meet the discharge standards, a significant amount of biogas was being emitted into the atmosphere un-hindered due to chronic failure of the recovery system, thus leading to fugitive methane emission. Since, the treatment facility could meet all discharge norms prescribed under pollution laws and in absence of regulation on fugitive methane emission from the wastewater facilities, UGSIL Seohara Distillery would have continued to operate the low efficiency digester and continue emitting fugitive methane.

Thus the baseline scenario for this part of the project would have been operation of inefficient digester no # 1 with negligible methane recovery and flaring/ combustion leading to high fugitive methane emissions from the hood of the digester. With no mandatory requirement from the host country to restrict fugitive emission of biogas from anaerobic treatment this part of the project would not have been implemented within the project lifetime.

With growth in distillery business, UGSIL Seohara Distillery is expected to generate additional wastewater. Although various treatment technologies are available in the market, treatment by open anaerobic lagoon system is the present trend of wastewater treatment in the sector. Since the open lagoon system involves minimal amount of investment at initial stage only for land procurement with negligible operation and maintenance cost, UGSIL Seohara Distillery would have treated the total amount of wastewater in the open anaerobic lagoon system, thus leading to fugitive methane emissions.

In the project scenario, the equivalent amount of wastewater is treated in closed anaerobic digester (Digester #2) and biogas is recovered to generate renewable energy.

Under project emission, emission from power usage in the project scenario has been considered as zero as the effluent flows under gravity and does not require any external energy use.

Project Category - Type - I. C. - Thermal energy for the user;

Baseline methodology mentioned in the paragraph no. 6 of Type I. C. of Appendix B of the simplified modalities and procedures for small scale CDM project activities, states that the baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced for renewable energy technologies that displace technologies using fossil fuels. IPCC default values for emission coefficients may be used.

In absence of project activity, the option for the generation of steam in similar kind of industries, in the business-as-usual case was “the usage of fossil fuel for the steam generation”.

Since the project activity utilizes the heat energy available in the captured methane to displace the technologies using fossil fuel and is inline with the baseline guidance provided for the project activity category Type IC (point no. 6 of Appendix B, I.C), the baseline calculation follows the guidance of Appendix B. The project activity has therefore used the guidance as in point no. 6 to calculate the baseline emissions for the project activity and is both transparent and conservative.

Leakage

If the used technology is equipment transferred from another activity or if the existing equipment is transferred to another activity, leakage effects at the site of the other activity are to be considered.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality): >>

Proposed project activity is eligible to use simplified methodologies as,

- It conforms to project category in "Appendix B of the simplified modalities & procedures for small scale CDM-project activities under TYPE IIIH– "Methane Recovery in Wastewater Treatment" &TYPE I C-" Thermal energy for the user "
- The project activity is a Methane recovery and its combustion from a Spent-Wash treatment facility. Both the measures will reduce anthropogenic emissions by sources and directly emit 14 kilotonnes of carbon dioxide which is less than 60 kilotonnes of carbon dioxide equivalent annually as required by category IIIH
- It is renewable energy project that displaces grid electricity, which is largely based on fossil fuel combustion and is less than 15 MW (Capacity is only 3.0 MW).
- It is not a debundled component of a larger project activity, as it qualifies guidelines in "appendix C to the simplified M&P for the small-scale CDM project activities for guidance on how to determine whether the proposed project activity is not a debundled component of a larger project activity".

Establishing Baseline & Additionality

Project Alternatives:

1. Installing less cost intensive open lagoons for Spent-Wash treatment and meeting the electricity demand from the Fossil fuel.
2. Installation of a Spent-Wash treatment facility based on anaerobic digestion and capturing Methane in a controlled way from the system to use in a power generation unit.

Additionality of the project activity has been established as per the guidelines suggested in Attachment A to Appendix B.

Investment Barrier

- As per the charter on corporate responsibility for environmental protection (CREP) Waste Water treatment laws of State Pollution Control Board & guidelines of Central Pollution Control Board, existing molasses based distilleries to ensure compliance of Zero discharge with any or combination of the following measures:
- Compost making with press mud/agricultural residue / Municipal Waste;
- Concentration and drying / Incineration;

- Treatment of spent wash through biomethanation followed by two stage secondary treatment and dilution of the treated effluent with process water for irrigation as per norms prescribed by CPCB / MoEF;

- Treatment of spent wash through bio-methanation following by secondary treatment (BOD < 2500 mg / l) for controlled discharge into sea through a proper submerged marine outfall at a point permitted by SPCB / CPCB in consultation with National Institute of Oceanography (NIO), so that Dissolved Oxygen in the mixing zone does not deplete, less than 4.0 mg/l;

As the industry is free to achieve this using whichever technology it deem fit. Generally the distilleries in India have the open lagoon system for treatment of this high BOD/COD water, and then compost making with press mud and agricultural residue, which are equally effective and less cost intensive. But in open lagoon system Methane generated due to decomposition of waste escape into open atmosphere and there is no Methane capturing involved. Methane is a potent GHG and thus harmful to our environment.

UGSIL Seohara Distillery being conscious towards its social responsibilities has always adopted technologies, which have helped in sustainable development of the region. Due to this it adopted the project activity of controlled decomposition of waste in a digester and captures the Methane generated.

Methane capture project had its own barriers for implementation, which had to be overcome by UGSIL Seohara Distillery to implement the project and to reduce green house gas emissions. The biggest barrier for the implementation of the project was the investment cost. It required more on the part of UGSIL Seohara Distillery in terms of investments, managerial intervention and operation and maintenance controls of the technology. It also has to invest in other related facilities such as laboratory infrastructure at the site for the analysis of wastes, production & control of bacteria for the digester etc. The project activity also involves power generation using the captured Methane in the decomposition plant and so required additional investments in turbine, boiler, allied systems, required controls and suitably skilled human resource.

However, UGSIL Seohara Distillery went ahead to implement the project to reduce greenhouse gas emissions and to utilize the methane to generate electricity. The revenue from the utilization of methane as fuel is discussed below to determine whether the project can occur as a BAU. The important parameters of financial analysis of the project are given below with project specific data.

Also the plant has 2 Diesel Gen. set installed, which are still operational.

Thus the current supply of diesel fuel meets the requirements of the plants and is expected to do so in the future years. There is therefore no immediate need to change the current practice.

The internal rate of return (IRR) for the project activity over the lifetime of the project stands at a low –14.18%, which was not attractive enough to proceed on a business – as – usual basis. However, the CDM revenue consideration in the financial analysis had increased the IRR to 10.73%.

Thus a significant amount of investment, spent only to avoid fugitive methane emission from open lagoon facility without any mandatory requirement and save only a marginal amount of fossil fuel and power cost not commonly seen in distillery sector in India. UGSIL Seohara Distillery took a conscious decision to undertake the project with a concern for global warming and GHG emissions reduction and thus seriously considered CDM benefits while making financial closure for the project.

All records on investment and equipment purchase are available with UGSIL Seohara Distillery's accounts division. Thus the project stands additional in terms of investment barrier.

Technological barrier

The project activity is methane combustion for power generation. The project proponent is using multiple fuels in the boiler such as rice-husk etc with biogas from ETP with some biomass.

Boiler design:

The fuel will be injected into the combustion chamber of the steam boiler by rotary valves. The utilization will take place on a grate-furnace facility, designed as a moving grate and equipped with a combustion control device. The combustion will be fostered through the injection of pre-heated primary air. A secondary injection in the upper part of the chamber assures an excellent burnout of the fuel. The process water will be heated to super-heated steam with a temperature of 420°C and a pressure of 43 bar by the flue gas in the steam boiler (vertical construction). Besides the boiler itself, a high efficiency heater system will be installed, comprising an:

- Economiser to upraise the water temperature,
- Air pre-heater to upraise the temperature of the primary air
- Super heater to dry the steam and to upraise its temperature

The process control including temperature selection in the boiler system will minimize the emissions of NOx. Wet Scrubber Filter, guaranteeing emission values lower than, will filter the exhaust gas 150 mg SPM/Nm^3, and pumped by the mean of a fan into a 40 m stack to the atmosphere.

Anaerobic biomethanation system in UGSIL Seohara Distillery uses a specially designed **Mixed Tank Biodigester,** to convert organic matter into useful energy in the form of Biogas.

The biological process of conversion takes place at Mesophilic temperature in a controlled atmosphere ensuring maximum conversion efficiency & production of Biogas. MTR is specially designed to handle highly toxic distillery waste taking into account the suspended solids, toxic compounds & high COD and BOD in spent wash, shock loads arising out of distillery operation and variations in feed characteristics, variation in temperature conditions. Special geometry of the Reactor with unique design of the Mixing System ensures excellent mixing of organic matter with suspended biomass ensuring optimum reaction time. The hydraulic retention time enables higher COD loading without dilution, reducing water consumption and further cost of treatment/disposal. It also avoids shock loading and malfunctioning of the reactor. Scientifically

designed parallel plate clarifier system for separation and recycle of biomass to reactor maintains optimum biomass quantity thereby ensuring maximum biogas generation. Design of sludge receiving and settling system prevents build-up of inorganic solids in the reactor leading to consistent performance over a longer period. Minimum reactor internals prevent build up of inorganic sludge ensuring maximum utilization of reactor volume over longer period. Proper heating and cooling system provided to ensure consistent performance even during winter season. However this requires more space and investments and additional power in agitators to completely mix the wastewater during digestion process. The technology barrier also existed for treatment of distillery wastewater by advanced treatments other than open anaerobic lagoons as earlier systems of anaerobic digestion had high maintenance problems leading to disruption in production of distillery itself. Few anaerobic reactors with media had completely choked due to suspended solids in the wastewater. This had also acted as a barrier for implementation of the project. However technology providers have learnt from the problems and have developed systems to overcome the problems. Although this process has been quite successful, proven and established, the risk of technology always existed and acted as a barrier for implementation of the project.

Regulatory or policy requirements

As per the norms of central Pollution Control Board in India, there is no regulatory or policy requirement on selection of technology for Spent-Wash treatment in industrial facilities. So, the technology adopted in the project activity is not choice for treatment due to high cost involved and the requirement of better operational controls. Also biogas recovery plant is not a legal requirement for UGSIL Seohara Distillery. However, UGSIL Seohara Distillery appreciating the importance of recovering energy and reducing GHG pollution in the atmosphere had implemented the project activity to capture biogas and utilize as fuel to produce electricity. Thus, emission reductions would not have occurred in the absence of the project activity.

Summary

The proposed project activity is not a business-as-usual scenario and carries investment & technology risks and thus qualifies the additionality tests. These investment & technology barriers stall implementation of such type of project activity.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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PEy = PEy, power + PEy,ww,treated + PEy,s,final + PEy,fugitive + PEy,dissolved ---------(1)

where:
PEy project activity emissions in the year “y” (tonnes of CO2 equivalent)
PEy,power emissions through electricity or diesel consumption in the year “y”
PEy,ww,treated emissions through degradable organic carbon in treated wastewater in year “y”
PEy,fugitive emissions through methane release in capture and flare systems in year “y”.
PEy,dissolved emissions through dissolved methane in treated wastewater in year “y”

$PEy,power = P_{ETP} * EF_{grid}$---------- (2)

Where:

P_{ETP} is the total amount of power used for running the auxiliary of treatment facility within the project boundary

EF_{grid} the emission factor of grid as per Type I D

As the power used for this part of the project would be generated from biogas and rice husk, there would not be any addition emission due to project activity using power.

PEy, ww, treated = Qy, ww * CODy, ww, treated * Bo, ww * MCFww, final * GWP_CH4
----------(3)

Where:

Qy, ww volume of wastewater treated in the year "y" (m3)

CODy, ww, treated chemical oxygen demand of the treated wastewater in the year "y" (tonnes/m3)

Bo, ww methane producing capacity of the wastewater (IPCC default value for domestic wastewater of 0.21 kg CH4/kg. COD)

MCFww, final methane correction factor based on type of treatment and discharge pathway of the wastewater (fraction)

GWP_CH4 Global Warming Potential for CH4 (value of 21 is used)

PEy, s, final

This term is not taken into consideration, as the sludge produced is not decayed anaerobically. It is sun dried and used for soil application. So as per the methodology, this term can be neglected.

PEy, fugitive = PEy, fugitive, ww + PEy, fugitive, s ---------- (4)

Where:

PEy, fugitive, ww Fugitive emissions through capture and flare inefficiencies in the anaerobic wastewater treatment in the year "y" (tonnes of CO2 equivalent)

PEy, fugitive, s Fugitive emissions through capture and flare inefficiencies in the anaerobic sludge treatment in the year "y" (tCO2e). This term is not taken into consideration.

PEy, fugitive, ww = (1 – CFEww) * MEPy, ww, treatment * GWP_CH4----------(4.1)

Where:

CFEww capture and flare efficiency of the methane recovery and combustion equipment in the wastewater treatment (a default value of 0.9 shall be used, given no other appropriate value)

MEPy, ww, treatment methane emission potential of wastewater treatment plant in the year "y" (tonnes)

MEPy, ww, treatment = Qy, ww * CODy, ww, untreated * Bo, ww * MCFww, treatment ----------(4.2)

Where:

CODy, ww, untreated Chemical oxygen demand of the wastewater entering the anaerobic treatment reactor/system with methane capture in the year "y" (tonnes/m3)

MCFww, treatment methane correction factor for the wastewater treatment system that will be equipped with methane recovery and combustion

PEy, dissolved = Qy, ww * [CH4] y, ww, treated * GWP_CH4 ---------- (5)

Where:

[CH4] y, ww, treated dissolved methane content in the treated wastewater (tonnes/m3). In aerobic wastewater treatment default value is zero, in anaerobic treatment it can be measured, or a default value of 10e –4 tonnes/m3 can be used.

The amount and characteristics of the methane dissolved in treated wastewater in the baseline situation will not change in the proposed project activity. So this term is neglected.

B.6.2. Data and parameters that are available at validation:

(Copy this table for each data and parameter)

Data / Parameter:	Qy,ww
Data unit:	M3
Description:	Quantity of waste water generated in a year
Source of data used:	Plant data
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied:	The choice of data therefore satisfies the guidance in the methodology, AMS III H.

Any comment:	Nil
Data / Parameter:	CODy, ww, untreated
Data unit:	Tonnes/M3
Description:	Chemical Oxygen demand of untreated waste water
Source of data used:	Plant Data
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied:	The choice of data therefore satisfies the guidance in the methodology, AMS III H.
Any comment:	
Data / Parameter:	
Data unit:	kl
Description:	Consumption of fossil fuel by plant
Source of data used:	Plant Data
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied:	
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

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Baseline formulae:

Baseline

For Spent-Wash Treatment part:

The existing anaerobic wastewater or sludge treatment system without methane recovery and combustion, in the case of the introduction of methane recovery and combustion units to one or both of these systems.

BEy = Qy, ww * CODy, ww, untreated * Bo, ww * MCFww, treatment * GWP_CH4

----------(6)

For the above cases the methane generation capacity of the treated wastewater (Bo, ww) shall be IPCC lower value of 0.21 kg CH4/kg .COD.

For Power Generation Part:

The baseline is emissions due to the equivalent power generation in diesel genset.

For renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced. IPCC default values for emission coefficients may be used. Para 6 of AMS I C

Leakage

No leakage calculation is required as per the Appendix B of the simplified modalities and procedures for small-scale CDM project activities as there is no energy generating equipment is transferred from another activity or no existing equipment is transferred to another activity.

.6.4 Summary of the ex-ante estimation of emission reductions:

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	Estimation of project activity emissions (tonnes of CO2e)	Estimation of baseline emissions (tonnes of CO2e)	Estimation of leakage (tonnes of CO2e)	Estimation of overall emission reductions (tonnes of CO2e)
Year 1	13867.49	135475.2	0	121607.71
Year2	13867.49	135475.2	0	121607.71
Year 3	13867.49	135475.2	0	121607.71
Year 4	13867.49	135475.2	0	121607.71
Year5	13867.49	135475.2	0	121607.71
Year 6	13867.49	135475.2	0	121607.71

Year 7	13867.49	135475.2	0	121607.71
Year 8	13867.49	135475.2	0	121607.71
Year 9	13867.49	135475.2	0	121607.71
Year 10	13867.49	135475.2	0	121607.71
Total tonnes of CO2e	**138674.9**	**1354752**	**0**	**1216077.1**

B.7 Application of the monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)	
Data / Parameter:	**$Q_{,ww,untreated}$**
Data unit:	M^3
Description:	Wastewater flows entering system (digesters, lagoons) boundary at project scenario
Source of data to be used:	Plant data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	The effluent inflow will be monitored by cumulative volumetric flow measuring meters. Flow meters will be calibrated once in a year.
QA/QC procedures to be applied:	yes
Any comment:	

(Copy this table for each data and parameter)	
Data / Parameter:	**$Q_{,ww,treated}$**
Data unit:	M^3
Description:	Wastewater flows leaving project (digesters, lagoons) treatment facility at project scenario
Source of data to be used:	Plant data
Value of data applied	

for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	The effluent inflow will be monitored by cumulative volumetric flow measuring meters. Flow meters will be calibrated once in a year.
QA/QC procedures to be applied:	Yes
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	**$COD_{ww,untreated}$**
Data unit:	Kg COD/m3
Description:	Chemical oxygen demand of the effluent entering the project boundary at project scenario
Source of data to be used:	Plant data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Daily analysis of sample is conducted at in-house lab and observations are recorded. COD would be sampled on daily basis average values will be considered for calculation with 95% confidence interval.
QA/QC procedures to be applied:	Yes
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	**$COD_{,ww, treated}$**
Data unit:	Kg COD/m3
Description:	Chemical oxygen demand of the effluent leaving the project boundary at project scenario
Source of data to be used:	Plant data
Value of data applied for the purpose of calculating expected emission reductions	

in section B.5	
Description of measurement methods and procedures to be applied:	Daily analysis of sample is conducted at in-house lab and observations are recorded. COD would be sampled on daily basis average values will be considered for calculation with 95% confidence interval
QA/QC procedures to be applied:	Yes
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	Nm3
Description:	Volume of biogas sent to the boilers
Source of data to be used:	Plant Data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Cumulative volumetric flow meter is installed to record the total biogas send with account of pressure and temperature correction. All meters will be calibrated on yearly basis. And all weighment measurement will be crossed referred.
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	M3
Description:	Methane generated in the digester
Source of data to be used:	Plant data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of	

measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	%
Description:	%CH4, Volumetric content of Methane in biogas
Source of data to be used:	Lab record
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	Kg/cm2
Description:	Pressure of Methane
Source of data to be used:	Plant data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	

QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	Deg C
Description:	Temp. of Methane
Source of data to be used:	Plant data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	Kg/Nm3
Description:	Density of Methane
Source of data to be used:	Plant data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	

Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	MT
Description:	Total steam generated at the project by firing biogas, bio solids, rice husk
Source of data to be used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Separate log sheet will be maintained. The total steam generated and its characteristics can be crossed check at the user end.
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	^{o}C
Description:	Temperature characteristics at individual steam out of the boilers within the project boundary
Source of data to be used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	

Data / Parameter:	
Data unit:	Kg/m2
Description:	Pressure characteristics of individual boilers within the project boundary
Source of data to be used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	KWh
Description:	Generation of electricity by the project
Source of data to be used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Electricity meter. Total electricity generated and used by the project will be a metered at all possible end.
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	KW
Description:	Total auxiliary power consumption by the ETP plant
Source of data to be	

used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	The total power load of the ETP unit will be estimated based in number of electrical equipments installed and their load capacity. Total electricity used by the project will be metered at all possible ends
QA/QC procedures to be applied:	
Any comment:	
(Copy this table for each data and parameter)	
Data / Parameter:	
Data unit:	Hour
Description:	Total operating hours of the auxiliary power units of the ETP plant
Source of data to be used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	At time when there will be stoppage any electric motor/ unit, its downtime will be recorded. As per operating procedure ETP unit is operated for 24 hours. Subtracting any downtime will provide actual run time hours.
QA/QC procedures to be applied:	
Any comment:	

B.7.2 Description of the monitoring plan:

>>

Project Monitoring Plan

UGSIL Seohara Distillery proposes to monitor, record and archive the following parameter for this part of the project: -

1. The amount of methane recovered and used as fuel or combusted at the project
2. Efficiency of the flaring system
3. Calibrate flow meters once in every year.

4. Maintain the sampling devices and gas analyser on daily basis as per requisite of sampling and analysis procedure.
5. All periodical measurements of sampling will be maintained with at a 95% confidence level.
6. The project will treat the sludge in the aerobic sludge drying beds and same would be monitored to prove that there would not be development of anaerobic condition and thus methane generation.
7. In case at any time during the crediting period the sludge generated undergoes anaerobic condition, IPCC default values for degradable organic content for calculation of methane emission from sludge degradation.
8. Project includes cogeneration, co-firing biogas/ bio-solid with rice husk, all the fuel types and their feeding amount will be monitored, recorded and archived.
9. Steam and electricity generation will be monitored using energy meters both at the generation and user ends.
10. The amount of Bagasses/rice husk purchased will be based on invoices/receipts from units as well as weighbridge logs. This will be audited on a regular basis under statutory audit and/or internal audit.
11. The energy content of the rice husk would be measured on as and when purchased basis.

B.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity (ies)

>>

VCSL, contact details as listed in Annex I.

UGSIL, contact details as listed in Annex I.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>
Sept 2004

C.1.2. Expected operational lifetime of the project activity:

>>
20 years

C.2 Choice of the crediting period and related information:

A fixed ten-year crediting period has been chosen.

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

>>
Not selected

C.2.1.2. Length of the first crediting period:

>>
Not selected

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
15/03/2007

C.2.2.2. Length:

>>
10 years

SECTION D. Environmental impacts

>>

D.1. Documentation on the analysis of the environmental impacts, including trans boundary impacts:

>>

The Host Party, i.e. Ministry of Environment and Forest, Government of India, does not require Environmental Impact Assessment of wastewater treatment projects within an industrial facility. All necessary safety and environmental requirements of relevant Indian legislation would be met for the facilities implemented or planned.

As mentioned, UGSIL Seohara Distillery management have proactively considered alleviating climate-change impacts considering CDM benefits and have taken risks to propose technology measures over and above traditional processes. Thus the following benefits would accrue from this project:

- Reduction of a high global warming has (methane) emission;
- Reduction in GHG emission from combustion of fossil fuel;
- Conservation of fossil fuel (natural resource of commercial energy); Sustainable Development;

- Reduction of environmental deterioration due to extraction (dust and acid mine drainage), processing (dust and wastewater) and procurement of fossil fuel (poor ambient air quality);
- Reduction of thermal power emissions
- Mitigation of odor and other nuisance of open lagoon and storage systems;

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

Environmental impacts are not considered significant.

SECTION E. Stakeholders' comments

>>

E.1. Brief description how comments by local stakeholders have been invited and compiled:

>>

UGSIL Distillery has conducted a local stakeholders' meeting, on October 10, 2006. The meeting took place at D.R. Dani Mahila Mahavidyalaya, Village Mandori that is about 2kms from the project site. 18 participants from the local inhabitants nearby the Project site, have attended the meeting where they showed strong interest in the Project as it improves the local environment, provides local population with employment and helps India to contribute to global efforts to mitigate GHGs. UGSIL Distillery made a presentation on the Project in Hindi and English by using power point slides, for better understanding. There were opportunities for the participant to ask questions or give comments during and after the presentation.

The following are brief descriptions of UGSIL presentation at the meeting.

• Explanation of the main objective of the Project
• Introduction of global warming
• Explanation of the process that collects biogas from the Digestor and usage of the collected biogas to generate thermal energy
• Explanation of how the Project contributes to reducing GHG emissions
• Description of the safety as well as maintenance and operation of the system controlled by experienced and skilled team

E.2. Summary of the comments received:

>>

All the questions were answered by UGSIL and accepted by the attendance.

E.3. Report on how due account was taken of any comments received:

>>
The comments received from the attendance are all in favour of the proposed project and no negative comments have been received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Upper Ganges Sugar & Industries Ltd., Seohara Distillery
Street/ P. O. Box:	--
Building:	---
City:	Seohara, District: - Bijnor
State/Region:	Uttar Pradesh
Postfix/ZIP:	246 746,
Country:	India
Telephone:	91 - 1344 – 252322 / 251124
FAX:	91 – 1344 - 252321
E-Mail:	ugsilseoharadistillery@birla-sugar.com
URL:	www.birlasugar.com
Represented by:	
Title:	Executive Vice President
Salutation:	Mr
Last Name:	Jain
Middle Name:	C.
First Name:	A.
Department:	----
Mobile:	91-9412013108
Direct FAX:	----
Direct Tel:	----
Personal E-Mail:	---

Organization:	Vidula Consultancy Services Ltd.
Street/P.O.Box:	53, Syed Amir Ali Avenue

Building:	5th Floor, Shivam Chambers
City:	Kolkata
State/Region:	West Bengal
Postfix/ZIP:	700 019
Country:	India
Telephone:	033 – 2289 2284 – 85, 2281 4534
FAX:	91-33-22814874
E-Mail:	kolkata@vconsultancy.com
URL:	www.vconsultancy.com
Represented by:	
Title:	Consultant
Salutation:	Mrs.
Last Name:	Prasad
Middle Name:	---
First Name:	Vineeta
Department:	
Mobile:	91-9830553120
Direct FAX:	---
Direct tel:	---
Personal E-Mail:	Vineeta.pr@gmail.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No ODA is flowing to the project. This is a unilateral CDM project activity undertaken by the project proponent.

Annex 3

BASELINE INFORMATION

Left Blank on purpose

Annex 4

MONITORING INFORMATION
Refer B.7.2

Project Monitoring Plan

UGSIL Distillery Division is an ISO 9001:2000 certified, including Effluent Treatment Plant (ETP) - where the project activity exists and maintains all production/purchase/sales records as per audit guidelines. UGSIL has procedures in place for operation and maintenance of the plant machinery, equipments and instruments and it maintains data on maintenance & calibration of the equipments. The equipments used for CDM project would be the part of these procedures and document on maintenance and rectification done on all the monitoring equipments are maintained.

The project activity is, headed by Mr. A. C. Jain, Executive Vice President and Mr.Govind Mishra, Vice President (Operation) is the in-charge and responsible for the overall functioning of the Effluent Treatment Plant (ETP), a part of this Distillery.

The methodology requires monitoring of the following:

1. In the biomethanation plant; generation of biogas, Methane content in the biogas, waster water flow into digester, outflow of Spent-Wash after treatment in the digester, COD/BOD level of waster water at digester inlet and outlet.

2. Monitoring fuel use and output in the power generation plant at the distillery - e.g. fuel use and power output by the unit.

Formation of CDM Team:

A CDM project team would be constituted with participation from relevant departments. People would be trained on CDM concept and monitoring plan. This team will be responsible for data collection and archiving. This team will meet periodically to review CDM project activity check data collected, emissions reduced etc. On a weekly basis, the monitoring reports are checked and discussed by the senior CDM team members/managers. In case of any irregularity

observed by any of the CDM team member, it is informed to the concerned person for necessary actions. On monthly basis, these reports are forwarded to the management level.

- Executive Vice President (Unit Head): Overall responsibility of compliance with the CDM monitoring plans.
- Vice President (Operation): Responsibility for completeness of data,
- Manager Distillery -Reliability of data (calibration of meters), and monthly report generation

Training of CDM team personnel:

The training of the CDM team and plant personnel will be carried out on CDM principle, CDM activities, monitoring of data and record keeping through a planned schedule made in advance and a record of various training programmes undertaken would be kept for verification.

Day to day data collection and record keeping:

Plant data shall be collected on operation under the supervision of the respective Shift-in-charge and record would be kept in daily logs.

Reliability of data collected-

Testing the meters every half yearly basis checks the reliability of the meters. Documents pertaining to testing of meters shall be maintained.

Frequency-

The frequency for data monitoring shall be as per the monitoring details in Section B 7 of this document.

Calibration of instruments:

UGSIL is an ISO-9001: 2000 certified company and it has procedures well defined for the calibration of instruments. A log of calibration records is maintained. Instrumentation department in the company is responsible for the upkeep of instruments in the plant.

Maintenance of instruments and equipments used in data monitoring:

The operation department shall be responsible for the proper functioning of the equipments/ instruments and shall inform the concerned department for corrective action if found not operating as required. The concerned department shall take corrective action and a report on corrective action taken shall be maintained as done time to time along with the details of problems rectified.

Checking data for its correctness and completeness:

The CDM team would have the overall responsibility of checking data for its completeness and correctness. The data collected from daily logs is forwarded to the central lab after verification from respective departments.

Internal audits of CDM project compliance:

CDM audits shall be carried out to check the correctness of procedures and data monitored by the internal auditing team entrusted for the work. Report on internal audits done, faults found and corrective action taken shall be maintained and kept for external auditing.

Emergency preparedness:

The project activity does not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

Report generation on monitoring:

After verification of the data and due diligence on corrective ness if required an annual report on monitoring and estimations shall be maintained by the CDM team and record to this effect shall be maintained for verification.
