VERIFICATION REPORT FOR BIOMASS BASED COGENERATION PROJECT AT NECTAR LIFE SCIENCES LTD.

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Summary:

LGAI Technological Center, S.A. (hereafter referred to as Applus+ LGAI) has performed the 5th verification of the project "Biomass Based Cogeneration Project at Nectar Life Sciences Ltd." bearing VCS Project ID 251 with regard to the relevant requirements of VCS programme guidelines and standard (VCS standard version 3.6, VCS Validation and Verification Manual version 3.2 & VCS program guide version 3.6). The verification includes confirming the implementation of the monitoring plan of the registered VCS PD Version 5 dated 20/10/2010 and the application of the monitoring methodology as per AMS IC Version 15 dated 17/07/2009. A site visit was conducted to verify the data submitted in the Monitoring Report.

The project activity involves the installation of a new biomass based cogeneration system. The cogeneration system included a 6 MW single extraction cum condensing turbine generator and a 40 TPH capacity AFBC boiler with a pressure rating of 67 kg/cm2 and temperature 490°C. The extraction from the turbine is 20 TPH at 6 Kg/cm^2 and 256°C. It has been checked that, after extraction from the turbine, the steam is fed into the processes via De-superheating System (DSH), where water from deareater is added into the steam which increases the quantity of steam up to 24 TPH and decreases the temperature of steam as per the process requirements. This is as per the VCS PD description and found to be appropriate.

The project activity is catering electricity to unit 1 complex and steam & electricity to unit 2 complex. Being a renewable energy project, this project contributes towards reducing GHG emissions by replacing the same amount of electricity from the Northern, Eastern, Western and North Eastern (NEWNE) which would otherwise be generated by a fossil fuel based power plant and steam which would otherwise be generated by a fossil fuel fired boiler.

A risk based approach has been followed to perform this verification. In the course of verification, 04 Corrective Action request (CAR) and 01 Clarification requests (CLs) were raised and successfully closed.

The review of the monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews have provided Applus+ LGAI with sufficient evidence to verified the fulfillment of the stated criteria.

Verification Conclusion:

The conclusions of this report show, that the project, as it was described in the project documentation and monitoring report, is in line with all criteria applicable for the verification. This verification is based on the information made available to Applus+ LGAI and the engagement conditions are detailed in this report. No restrictions or uncertainties were identified related to the verification.

Applus+ LGAI confirms that the project is implemented in accordance with the registered VCS PD. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 166,484 tCO_2e during period 01/01/2013 to 30/06/2016.

Table of Contents

1 INTRODUCTION

1.1 Objective

LGAI Technological Center, S.A. (VVB) has been contracted by M/s Nectar Life Sciences Ltd., (project proponent), to conduct an independent verification of its reported greenhouse gas emission reductions from the "Biomass Based Cogeneration Project at Nectar Life Sciences Ltd.", with regard to the relevant requirements of VCS programme guidelines and standard (VCS standard version 3.6, VCS Validation and Verification Manual version 3.2 & VCS program guide version 3.6). The verifiers have reviewed the GHG data collected to date for the period from 01/01/2013 to 30/06/2016 (both days included).

The purpose of this verification exercise is to independently review the objective evidence:

- Whether the project has resulted in emission reductions as declared by the organisation or GHG project's GHG assertion;
- The data reported is accurate, complete, consistent, transparent and free of material error or omission.

1.2 Scope and Criteria

The scope of the verification was the independent and objective review and ex-post determination of the monitored reductions in GHG emissions from "Biomass Based Cogeneration Project at Nectar Life Sciences Ltd.". The verification of this project was based on the validated and registered project design document (PD), validation report and monitoring reports and supporting documents submitted by the project proponent to the verification team. The documents were reviewed against the following guidance and protocols:

- VCS Standard: VCS Version 3, 19 October 2016, v3.6 (VCS Standard)
- Approved Clean Development Mechanism (CDM) methodology AMS I C, version 15, "Thermal energy production with or without electricity".
- Validated VCS Project Description (VCS PD) dated 20.10.2010
- VCS Program Guide, Version 3, 19 October 2016, v3.6
- ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions, 2006

The verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Level of Assurance

The level of assurance of the verification report falls under reasonable assurance engagements as selected by the Client. Materiality for the project is 5%.

1.4 Summary Description of the Project

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Biomass Based Cogeneration Project at Nectar Life Sciences Ltd.
VCS Project ID	251
Monitoring Period Covered in this Report	01/01/2013 to 30/06/2016 (both days included)
Project Proponent	M/s Nectar Lifesciences Limited
Location of the Project Activity:	Villages: Saidpur, District: Mohali, State: Punjab, Country: India

The project activity involved the installation of a new biomass based cogeneration system and the supply of the generated electricity to the NEWNE Grid; whilst the process steam was used for the manufacturing process of the Unit 2 complex of the pharmaceutical plant. This project consists of renewable energy generation, which can replace the electricity generation from the fossil fuel dominated grid. The project activity is resulting in reductions of greenhouse gas (GHG) emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

The project activity consists of the cogeneration system included a 6 MW single extraction cum condensing turbine generator and a 40 TPH capacity Atmospheric Fluidised Bed Combustion (AFBC) boiler, with a steam pressure rating of 67 kg/cm2 and steam temperature output 490°C . The project has been commissioned on 27/05/2007. The same has been verified against the commissioning certificate. The project activity is fully functional and the assessment team verified this during the site visit.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification approach consists two phases.

- In the first phase, Applus+ LGAI completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;

- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the Monitoring Report.

At the end of this phase, Applus+ LGAI produced a Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Verification checklist, Applus+ LGAI verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the Monitoring Report. This verification report describes the findings of this assessment.

2.2 Document Review

The registered VCS PD (version 05 dated 20/10/2010), corresponding validation report, VCS MR and additional supporting documents related to the project performance submitted by the client were reviewed. A complete list of all documents reviewed is mentioned in Annex 1 of this report.

2.3 Interviews

The verification team has carried out interviews in order to verify the information included in the project documentation and to gain additional information regarding the compliance of the project with the VCS requirements. Before and during the on-site visit, the verification team has interviewed the representatives of the PP to confirm selected information and to clarify issues identified during the document review. The names and designations of the personnel interviewed are mentioned in section 2.4 below.

The main topics covered during the interview are as follows:

- General Aspects of the project
- Project Implementation
- Equipment and operation
- Staff Training procedures
- Calibration procedures
- Monitoring & Measuring System
- Data collection, recording and archiving procedure

- QA/QC procedures
- VCS documentation
- Emission reduction calculations

2.4 Site Inspections

As part of the verification, an on-site inspection has been performed and site visit was carried out on 12/08/2016 to 13/08/2016. During the site visit representatives of the PP were interviewed; i.e. personnel responsible for monitoring of the project activity, data collection and management, and QA/QC procedure. The details of the people interviewed and the topics discussed are mentioned in the table below:

Location: Village: Saidpur, Mohali districts, Punjab	**Date:** 12/08/2016 to 13/08/2016
Coverage	**Source of Information / Persons Interviewed**
Electricity Generation Records Reliability & accuracy of readings considered for Calibration procedure, calculating baseline emissions, project emissions and leakage.	Mr. Paramjit Singh (DGM, NLL) Mr. Harcharan Singh (Manager, NLL)
Monitoring and measuring system • Collection of measurements • Observations of established practices • Data Verification of monitoring parameters	Mr. Paramjit Singh (DGM, NLL) Mr. Kamaljit Sengal (Dy. Manager, NLL) Mr. Ravinder Vig (Manager, NLL) Mr. Harish Sharma (Sr. Consultant , EESL) Mr. Mukesh Sharma (Sr. Consultant , EESL)
QA/QC procedures, data management, internal audits to maintain data quality & reliability, maintenance Practices Consideration of monitoring period, monitoring methodology, project documentation and emission reduction calculations	Mr. Paramjit Singh (DGM, NLL) Mr. Harcharan Singh (Manager, NLL) Mr. Harish Sharma (Sr. Consultant , EESL) Mr. Mukesh Sharma (Sr. Consultant , EESL)
Discussion to clarify issues identified during the document review and the site visit through the findings document	Mr. Harish Sharma (Sr. Consultant , EESL) Mr. Mukesh Sharma (Sr. Consultant , EESL)

2.5 Resolution of Findings

As a consequence of the verification process, the verification team can raise different types of findings e.g.

Clarification Request (CL): shall be raised where inadequate or inaccurate information is available and clarification or new information is required.CL shall specify about the additional information is required.

Corrective Action Request (CAR): shall be raised where a non-conformance arises with reference to the following:

- The verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;

- The verification has identified misstatements in the reported emission reductions. Emission reductions with misstatements shall be discounted based on the verifier's ex-post determination of the achieved emission reductions

The verification process may be paused until this information has been made available to the verification team leader's satisfaction. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

FARs may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

Corrective Action Requests and Clarification Requests are detailed in Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to CLs and FARs.

2.5.1 Forward Action Requests

No forward action request has been raised during this verification.

2.6 Eligibility for Validation Activities

Applus LGAI is accredited to perform validation/verification activities in Sectoral Scope 1, which is the applicable scope for the approved methodology AMS I C.

3 VALIDATION FINDINGS

This project activity is registered under the VCS Version 2007.1. Thus it is concluded that all the rules and validation requirements set by the VCS were already taken care of at the time of the VCS validation of the project activity. Thus no further validation is required for the project activity.

3.1 Participation under Other GHG Programs

During the verification process, the verification team has reviewed the declaration submitted by the project proponent confirming that GHG emission reduction credits from the Project have not been registered under another GHG program.
It can be concluded that the project is eligible to participate under the VCS Program.

3.2 Methodology Deviations

Not applicable as no methodological deviations are found.

3.3 Project Description Deviations

Not applicable as no project description deviations are found.

3.4 Grouped Project

The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

Project activity is implemented and equipment's are installed as described in the registered VCS PD. This is the fifth verification for the project activity. The project activity has been commissioned and is operating satisfactorily. The same has been checked and verified during the site visit to the project activity. The project activity has been commissioned on 27/05/2007. The commissioning of the project activity has been verified against their commissioning certificate. The commissioning has already been validated and reported in the VCS validation report and the previous verification reports of this project activity.

The monitoring of the project activity is found to be in accordance with the monitoring methodology described in AMS I C, Version 15 .The monitoring mechanism is effective and reliable. During the site visit, personnel involved at various levels of the operation of the project activity have been interviewed to confirm that the plant personnel are conscious of the importance of the monitoring activities. The on-site verification of the plant records also substantiate consistency in recording and reporting of monitored data.

The required monitoring systems have been installed and are operational. The meters comply with appropriate quality standards applicable for the used technology. The accuracy class of the meters installed for the project activity were verified against the registered VCS PD, VCS MR and cross-checked against the PPA signed for the project activity.

The supporting documents for the entire monitoring period were checked and found to be sufficient to enable verification of emission reductions.

The verification team is able to confirm that the project is implemented as per the validated VCS PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The methodology (equations and formula) applied by the project proponent for the calculation of emission reductions is in accordance with the applied methodology AMS-IC version 15. The emission reductions have been arrived by the following equation:

$ER\ (tCO_2e) = BE\ (tCO_2e) – PE\ (tCO_2e) – LE\ (tCO_2e)$ ---------- (1)

Where:

ER = Emission Reductions accrued by the project activity (tCO_2e)

PE = Project activity emissions (tCO_2e)

LE = Leakage emissions (tCO_2e)

The Project Proponent has calculated the monthly baseline emissions in accordance with the equation (3) of the methodology AMS IC version 15 as reproduced below:

$$BE_{cogen,CO2,y} = [(EG_{PJ,thermal,y} + EG_{PJ,electrical,y} * 3.6)/ \eta_{BL,cogen}] * EF_{FF,CO2} \quad \text{----------(2)}$$

Where:

$BE_{cogen,CO2,y}$	The baseline emissions from electricity and steam displaced by the project activity during the year y; tCO_2
$EG_{PJ,thermal,y}$	The net quantity of thermal energy supplied by the project activity during the year y; TJ
$EG_{PJ,electrical,y}$	The amount of electricity supplied by the project activity during the year y; GWh
3.6	Conversion factor; TJ/GWh
$\eta_{BL,cogen}$	The total efficiency (including both thermal and electrical) of the cogeneration plant using fossil fuel that would have been used in the absence of the project activity. Efficiency should be calculated as the total energy produced (electricity and steam/heat extracted) divided by thermal energy of the fuel used.
$EF_{FF,CO2}$	The CO2 emission factor of the fossil fuel that would have been used in the baseline cogeneration plant; tCO2 / TJ obtained from reliable local or national data if available, otherwise IPCC default emission factors are used.

In above equation, the project proponent has taken default efficiency of the cogeneration plant as 100% which is fixed ex ante at the time of validation of the project. Similarly, the emission factor of coal is also fixed ex ante, which is the IPCC default emission factor for coal (96.1 tCO_2/TJ). The verification team considered both the values appropriate as default efficiency of the boiler is taken under the provisions of the Para 18 of the methodology AMS-I.C. version 15 itself and the value of emission factor has been taken from the IPCC, which was considered appropriate and conservative.

As described in the registered VCS-PD, the project proponent has also considered the project emissions accrued during the current monitoring period from diesel consumption used by the tractors (on site) for the levelling of the biomass. The algorithm used by the project proponent for the calculation of the project emissions from diesel consumption is also reproduced below:

$P.E. = (Q_D * D / 1000) * NCV_{Diesel} * EF_D$

Where:

P.E.	Project emission from the project activity; tCO_2e
Q_D	Quantity of diesel consumed in tractors used for levelizing the piles/heaps of biomass; Liters
D	Density of diesel; Kg/Liter
NCV_{Diesel}	Net Calorific Value of diesel; TJ/Tonnes
EF_D	Emission factor of diesel; tCO_2e/TJ

In the calculations of the project emissions from diesel consumption, the project proponent has taken three default values i.e. density of diesel (0.87 kg/ltr), NCV of diesel (0.04303 TJ/ton) and emission factor of diesel (74.1 tCO_2/TJ). All three default values have been fixed ex ante at the time of project validation; the values were taken from the data published by competent authorities. The values of $EG_{PJ,thermal,y}$ and $EG_{PJ,electrical,y}$ for the current monitoring period are based on metered data. Calibration certificate for current monitoring period were checked and the meters result were found to be in the acceptable range and hence the measured values are reliable. The PP has considered maximum distance of 150 KM for transportation and capacity of the truck as 8 tonnes per trip. Maximum distance of return trip from project site to collection center is mentioned to be 100 km in the registered PD. Hence, 150 KM is conservative for calculation of leakage. The detail calculation of leakage is checked from the emission reduction sheet and confirmed during site visit. The calculation approach adopted by the project proponent for leakage is in accordance with the registered VCS-PD and the approved methodology AMS-I.C. version 15.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The critical parameter used for the determination of the Emission Reductions is the net electricity supplied to the plant (Unit I and Unit II manufacturing complex) and the net steam supplied to the Unit II complex. The Gross Electricity generated by the co-generation system is recorded by the tri vector Energy meter of +/- 0.5 accuracy class (Make L&T) and the Net energy supplied (steam heat content) to Unit II complex is recorded by highly reliable distributed control system (DCS). In addition, steam parameters (pressure, temperature and instantaneous as well as totalized steam flow) are measured by Yokagawa and ABB transducers which act as a primary input to the DCS system. The data pertaining to the above parameters are maintained in the identified Plant records. All the pressure transmitters and temperature transducers are calibrated on annual basis by NABL (National Accreditation Board for Laboratories of India) certified laboratory. The results of calibration indicate that all the measuring equipments are within accuracy range specified by the respective manufacturer or the acceptability criteria specified by the user (the calibration details are provided at the end of section 4.3 of this report). All the data are in compliance with the figures stated in the final monitoring report. There were no instances of any meter change or failure noticed within this monitoring period. The table presented below provides details of the source of the data and the reliability of the evidence for critical parameters directly affecting the GHG emission reductions.

Parameter description as per PD	Source as per PD	Reliability of the evidence
The net quantity of thermal energy supplied by the project activity during the current monitoring period	Hourly log sheets recorded from DCS of the power plant	Reliable as the evidence is based on metered data which is calibrated on regular intervals as per the frequency specified in the monitoring plan of the registered VCS-PD.
The net quantity of electricity supplied by the project activity during the current monitoring period.	Shift log sheets recorded from the electronic trivector meters installed at the power plant	Reliable as the evidence is based on metered data which is calibrated on regular intervals as per the frequency specified in the monitoring plan of the registered VCS-PD.
Quantity of diesel consumed during the current monitoring period in levellling of the biomass (a project emission parameter)	Diesel purchase receipts from third party.	Reliable as data is based on the third party purchase slips
Quantity of Biomass purchased during the current monitoring period (leakage parameter)	Purchase slips generated by the project proponent for each truck.	Reliable as project proponent makes payment to the supplier on the basis of the biomass quantity specified in the biomass purchase slip.

The following parameters have been verified for current monitoring period:

- **Gross electricity generated from co-generation plant: (EG_y) (kWh)**

  As per the registered monitoring plan the gross electricity generated from co-generation plant is monitored daily and compiled monthly. The source of data is electricity log book and electronic database. This parameter is used for baseline emission calculation.

  The verified value as

  Year 2013 = 30,171,400.00 kWh

  Year 2014 = 33,051,800.00 kWh

  Year 2015 = 39,769,200.00 kWh

Year 2016 = 21,424,000.00 kWh

- **Net electricity consumed by the co-generation plant: ($EC_{Net\ Aux}$) kWh**

The net electricity consumed by the co-generation plant is calculated daily. The value has been calculated as formula: $EC_{Net\ Aux} = EC_{Aux.} – (EC_{BCK} + EC_{Unit\ 10})$. This parameter is used for baseline emission calculation.

The verified value as

Year 2013 = 10,680,753 kWh

Year 2014 = 7,693,300 kWh

Year 2015 = 8,234,477 kWh

Year 2016 = 4,365,440 kWh

- **It is the electricity consumed by BCK unit, Unit-10, and net auxiliary for the power plant.: (EC_{Aux}) (kWh)**

The electricity consumed by BCK unit, Unit-10, and net auxiliary for the power plant is monitored daily. The source of data is electricity log book and electronic database. This parameter is used for baseline emission calculation.

The verified value as

Year 2013 = 11,539,800.00 kWh

Year 2014 = 7,712,100.00 kWh

Year 2015 = 8,523,600.00 kWh

Year 2016 = 4,378,640.00 kWh

- **Electricity consumed at BCK unit.: (EC_{BCK}) (kWh)**

The electricity consumed at BCK unit is monitored daily. The source of data is electricity log book and electronic database. This parameter is used for baseline emission calculation.

The verified value as

Year 2013 = 0 kWh

Year 2014 = 0 kWh

Year 2015 = 0 kWh

Year 2016 = 3200.00 kWh

- **Electricity consumed at Unit-10: ($EC_{Unit-10}$) (kWh)**

  The electricity consumed at Unit-10.is monitored daily. The source of data is electricity log book and electronic database. This parameter is used for baseline emission calculation.

  The verified value as

  Year 2013 = 859,047.00 kWh

  Year 2014 = 18,800.00 kWh

  Year 2015 = 289,123.00 kWh

  Year 2016 = 10,000.00 kWh

- **Net electricity generated from cogeneration plant: (EG_{Net}) (kWh)**

  The Net electricity generated from cogeneration plant is monitored daily. The source of data is electricity log book and electronic database. This parameter is used for baseline emission calculation.

  The verified value as

  Year 2013 = 19,490,647.00 kWh

  Year 2014 = 25,358,500.00 kWh

  Year 2015 = 31,534,723.00 kWh

  Year 2016 = 17,058,560.00 kWh

- **Thermal energy (from Steam) supply to process ($EG_{PJ,thermal,y}$) (TJ)**

  Heat from steam is calculated with the help of parameters viz. quantity of steam, temperature of steam and pressure of steam. Steam flow is measured from steam flow meter of unit 2 and unit 10 separately. This parameter is used for baseline emission calculation.

  The verified value as

  Year 2013 = 322.25 TJ

  Year 2014 = 394.13 TJ

  Year 2015 = 451.83 TJ

  Year 2016 = 256.93 TJ

- **Quantity of Steam which was supplied to unit-2: (Q_{Unit-2}) (Tonnes)**

The quantity of steam which was supplied to unit-2 is monitored daily. The source of data is plant log book and electronic database. This parameter is used for baseline emission calculation.

The verified value as

Year 2013 = 74,481.00 Tonnes

Year 2014 = 101,387.00 Tonnes

Year 2015 = 122,179.00 Tonnes

Year 2016 = 75,796.00 Tonnes

- **Quantity of Steam which was supplied to unit-10: ($Q_{Unit-10}$) (Tonnes)**

The quantity of steam which was supplied to unit-10 is monitored daily. The source of data is plant log book and electronic database. This parameter is used for baseline emission calculation.

The verified value as

Year 2013 = 58,514.00 Tonnes

Year 2014 = 61,043.00 Tonnes

Year 2015 = 63,647.00 Tonnes

Year 2016 = 29,152.00 Tonnes

- **Plant of the Steam which was supplied to unit-2: (T_{Unit-2}) (°C)**

The temperature of the steam which was supplied to unit-2 is monitored hourly. The source of data is log book and electronic database. This parameter is used for baseline emission calculation.

The verified value as

Year 2013 = 227.25 ^{0}C

Year 2014 = 223.75 ^{0}C

Year 2015 = 223.75 ^{0}C

Year 2016 = 231.17 ^{0}C

- **Temperature of the Steam which was supplied to unit-10: ($T_{Unit-10}$) (°C)**

The temperature of the steam which was supplied to unit-10 is monitored hourly. The source of data is log book and electronic database. This parameter is used for baseline emission calculation.

The verified value as

Year 2013 = 177.75 ^{0}C

Year 2014 = 180.83 ^{0}C

Year 2015 = 181.50 ^{0}C

Year 2016 = 181.17 ^{0}C

- **Pressure of Steam which was supplied to unit-2 and unit-10: (P) (KG/cm^2)**

The pressure of steam which was supplied to unit-2 and unit-10 is monitored daily. The source of data is log book and electronic database. This parameter is used for project emission calculation.

The verified value as

Year 2013 = 5.81 KG/cm^2

Year 2014 = 5.88 KG/cm^2

Year 2015 = 5.86 KG/cm^2

Year 2016 = 5.92 KG/cm^2

- **Quantity of Rice Husk used: (Q_y) (Tonnes)**

The quantity of Rice Husk used is monitored daily. The source of data is log book and electronic database. This parameter is used for project emission calculation.

The verified value as

Year 2013 = 37,716.00 Tonnes

Year 2014 = 47,205.00 Tonnes

Year 2015 = 57,760.00 Tonnes

Year 2016 = 32,420.00 Tonnes

- **Quantity of Saw dust used: (Qy) (Tonnes)**

The Quantity of Saw dust used in the boiler was calculated by spring balance system which is in place for all the 3 conveyer belts is monitored daily. The source of data is electronic database. This parameter is used for leakage emission calculation.

The verified value as

Year 2013 = 8,142.30 Tonnes

Year 2014 = 5,142.20 Tonnes

Year 2015 = 6,910.80 Tonnes

Year 2016 = 394.00 Tonnes

Following parameters has been considered in the registered VCS PD. However, these parameters are not applicable in the current monitoring period as values of these parameters are zero. This was checked verification of log books and during site visit observation.

a) Quantity of Paddy straw used: (Q_y) (Tonnes)

b) Quantity of Mustard husk used: (Q_y) (Tonnes)

c) Quantity of Barely used: (Q_y) (Tonnes)

d) Quantity of Sugarcane trash used: (Q_y) (Tonnes)

e) Quantity of Cotton sticks desi used: (Q_y) (Tonnes)

f) Quantity of Bajra stalk used: (Q_y) (Tonnes)

g) Quantity of Sunflower stalk used: (Q_y) (Tonnes)

h) Quantity of Moong straw used: (Q_y) (Tonnes)

i) Quantity of Arhar Stick used: (Q_y) (Tonnes)

j) Quantity of Arhar husk used: (Q_y) (Tonnes)

k) Quantity of Saw chips used: (Q_y) (Tonnes)

The assessment team has confirmed during the site visit that, all the parameters are monitored in compliance with the registered monitoring plan under the registered VCS PD. During the verification assessment of the fifth monitoring period for the project activity, the accuracy of all the metering have been checked and found appropriate. The installation and working conditions of the meters were checked during the on-site inspection and were found to be satisfactory. Details of meters are provided in below table.

Parameter	**Meter Sr. No.**	**Calibration Date**	**Calibration Due Date**	**Comments**

EG_y	06744912	20/03/2012, 19/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
EC_{Aux}	UPB09919	20/03/2012, 19/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
EC_{BCK}	07882301	20/03/2012, 19/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
$EC_{Unit-10}$	07884932	20/03/2012, 19/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
Q_{Unit-2}	91G216756	20/03/2012, 18/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
$Q_{Unit-10}$	0700043	20/03/2012, 18/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
T_{Unit-2}	DSR 3219	20/03/2012,18/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
$T_{Unit-10}$	TE 1100	20/03/2012, 18/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
P	91F935651	20/03/2012, 18/03/2013, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK
$GCV_{Rice\ Husk}$	T/A5	30/12/2012, 31/12/2013, 30/12/2014, 29/12/2015	28/12/2016	OK

4.4 Non-Permanence Risk Analysis

Not applicable in this project activity.

5 SAFEGUARDS

5.1 No Net Harm

This simple biomass project and there are no any potential negative environmental and socio-economic impacts identified by the project proponent. The same was verified by assessment team during site visit and found to be correct and hence accepted.

5.2 Local Stakeholder Consultation

Not applicable .

6 VERIFICATION CONCLUSION

M/s. Nectar Life Sciences Ltd. has contracted the LGAI Technological Center, S.A. (also referred to as Applus+ LGAI) to verify that the greenhouse gas (GHG) emission reductions reported for the "Biomass Based Cogeneration Project at Nectar Life Sciences Ltd." (Project ID 0251) for the period from 01/01/2013 to 30/06/2016 in the VCS Monitoring Report Version 02 dated 01/12/2016 are eligible for issuance as Verified Carbon Units.

This engagement covers the verification of emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the project "Biomass Based Cogeneration Project at Nectar Life Sciences Ltd." (Project ID 0251), as well as an additional confirmation of the compliance of the VCS PD with the requirements of VCS Standard version 3.6.

Applus+ LGAI is an entity accredited by the United Nations Framework Convention on Climate Change (UNFCCC) to undertake certification and verification services in the sectoral scope in which the Project is undertaken.

The VCS Monitoring Report, together with other information examined, was prepared as per the VCS Monitoring Report Template, Version 3.4.

The information in the VCS Monitoring Report together with other information examined by the assessment team, including all the information necessary to determine that the emission reductions achieved have been determined correctly.

In view of the information provided in the VCS Monitoring Report and other relevant information, it can be concluded that the project meets all the requirements of the VCS Standard Version 3.6.Also on the basis of our examination of the VCS Monitoring Report and other relevant information, the emission reductions during the monitoring period from 01/01/2013 to 30/06/2016 (both the days included) are verified as 166,484 tCO_2e.

The management of M/s Nectar Life Sciences Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions. Applus+ LGAI is responsible for verification and confirming emission estimates for the project, as described in the VCS Monitoring Report.

The certification approach followed by Applus+ LGAI, draws on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes an assessment of evidence, through desk review, and where necessary, interviews, stakeholder discussions and site visits, relevant to certifying the rightfulness of the amounts and disclosures in relation to the Project's GHG emission reductions.

We planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that the amount of GHG emission reductions for the given period, prepared on the basis of the Monitoring Report, are fairly stated.

Based on process and procedures conducted, in our opinion, M/s Nectar Life Sciences Ltd. assertion on GHG emission reductions for the "Biomass Based Cogeneration Project at Nectar Life Sciences Ltd." (Project ID 0251) project during the reporting period 01/01/2013 to 30/06/2016 is materially correct and is a fair representation of the GHG data and information and the emission reductions are fairly stated. The GHG emission reductions were calculated correctly on the basis of approved monitoring methodology AMS I C version 15.The verification team also confirms that the project is implemented as described in the validated VCS PD.

Therefore, Applus+ LGAI is able to certify that the project is in full compliance with the VCS Standard Version 3.6, and the quantity of the reported emission reductions during below reporting period are completely, comparably, accurately and correctly reported.

Verification period: From 01-01-2013 to 30-06-2016

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2013	37,711	84	565	37,062
Year 2014	46,649	90	681	45,878
Year 2015	54,330	90	842	53,399
Year 2016	30,593	46	402	30,145
Total	169,283	310	2,489	166,484

APPENDIX 1: DOCUMENT REFERENCES

Ref. No	Document
1	VCS Project Description Version 5 dated 20/10/2010
2	VCS Validation report Number: INDIA-VCS-VAL/90.49/2010 dated 21/10/2010 issued by Bureau Veritas Certification Holding SAS
3	VCS Project Webpage (VCS ID. 251) http://www.vcsprojectdatabase.org/#/project_details/251
4	Applied Methodology, AMS I C version 15 dated 17/07/2009
5	Previous Verification Reports: • 1st Verification: Report No.: INDIA-VCS-Ver/90.49/2010 dated 21/10/2010 issued by Bureau Veritas Certification Holding SAS • 2nd Verification Report version 1.0 dated 05/07/2011 issued by Bureau Veritas Certification Holding SAS • 3rd Verification Report No.: INDIA-VCS-Ver3/90.49/2012 version 2.0 dated 31/12/2012 issued by Bureau Veritas Certification Holding SAS • 4th Verification Report No.: CCP.VOL0927 VCS VER MP4 (VCS Project ID 251) version 03 dated 08/08/2014 issued by SGS United Kingdom Limited
6	Monitoring Report
7	Emission Reduction Sheet
8	Daily electricity Generation and auxiliary consumption reports of the Power plant for the current monitoring period from 01/01/2013 to 30/06/2016
9	Daily steam consumption data for Unit -2 and Unit -10 for the current monitoring period from 01/01/2013 to 30/06/2016
10	Daily records of Gross Calorific Value (GCV) and Moisture Content of the Biomass for the current monitoring period from 01/01/2013 to 30/06/2016
11	Monthly biomass purchase/consumption Data and Records of annual plant operations days.
12	Purchase receipts of diesel for year 2013, 2014, 2015 and 2016
13	Calibration Certificates for Gross Energy meter, Auxiliary energy meter, BCK energy meter, Unit I energy meter, Unit II energy meter and Unit 10 energy meter.
14	Calibration Certificates for Pressure Transmitters, Temperature Transudces, Steam Flow Transmitter, Steam Flow Totalizer.
15	Commissioning certificate dated 27/05/2007
16	VCS Standard Version 3.6
17	VCS Programme Guide Version 3.6
18	Declaration issued by the PP

APPENDIX 2: ABBREVIATIONS

AFBC	Atmospheric Fluidised Bed Combustion
BEF	Baseline Emission Factor
BM	Build Margin
CAR	Corrective Action Request
CEA	Central Electricity Authority
CL	Clarification Request
CMP	Conference of Parties Serving as Meeting of Parties
CO2	Carbon dioxide
DCS	Distributed Control System
DSH	Desuperheating System
EB	Executive Board
FAR	Forward Action Request
GHG	Green House Gas
ISO	International Standards Organization
kW	Kilowatt
kWh	Kilowatt hour
MR	Monitoring Report
MW	Megawatt
MWh	Megawatt-hour
NEWNE	Northern Eastern Western Northern-Eastern
NLL	Nectar Lifesciences Ltd.
PD	Project Description
PLF	Plant Load Factor
PP	Project Proponent
PPA	Power Purchase Agreement
QA/QC	Quality Assurance and Quality Control
tCO_2	Tonnes of Carbon Dioxide
TPH	Tonnes Per Hour
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCSA	Voluntary Carbon Standard Association
VCS PD	VCS Project Description
VCUs	Voluntary Carbon Units

APPENDIX 3: FINDINGS OVERVIEW

Findings Overview Summary

Type	CAR	CL	FAR
Total Number raised	04	01	00

Table 01: Remaining FAR from validation and/or previous verification

FAR ID	N/A	**Section no.**	N/A	**Date:** N/A
Description of FAR				
N/A				
Project participant response				**Date: N/A**
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				**Date: N/A**
N/A				

Table 1. CL from this verification

CL ID	01	**Section no.**	VCS MR 1.9	**Date:** 23/09/2016
Description of CL				
The PP is requested to provide declaration confirmation on followings: 1. The Project is not part of any other Emission Trading Programs and Other Binding Limits. 2. The PP is not claiming any Other Forms of Environmental Credit for this project. 3. The project activity is not participating under any other GHG programs				
Project participant response				**Date:** 01/12/2016
PP undertake that the project activity titled “Biomass Based Cogeneration Project at Nectar Life Sciences Ltd.” was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction. Further the project is voluntary and hence not a part of any legal or regulatory requirement or any other Trading Programs and Other Binding Limits. Also the project hasn’t created any other form of environment credit for the crediting period May 2007 to April 2017. Also for this period M/s Nectar Life Sciences Ltd. will not be participating under any other GHG programme and will not be claiming any other credits other than VCU under VCS Programme.				
Documentation provided by project participant				
Signed copy of declaration Letter				
DOE assessment				**Date:** 28/02/2017
The PP has submitted declaration Letter and same was checked and confirm the requested information, hence CL#01 closed satisfactorily.				

Table 2. CAR from this verification

CAR ID	01	**Section no.**	1.1,1.4	**Date:** 23/09/2016
Description of CAR				

1. The PP is requested to provide monitoring period and calculated emission reduction for current monitoring period in section 1.1 of the MR.
2. The PP is requested to clarify why the section 1.4 left blank , it is request to the PP , please mentioned Not Applicable if section is not relevant to project.
3. The PP is requested to maintained consistent date format throughout the monitoring report.
4. The PP is requested to remove specific guideline for fill VCS-MR from monitoring report.
5. The text font is not consistent throughout the monitoring report , please correct the same.
6. The PP is requested to provide all relevant information in MR APPENDIX as applicable, or delete the same.

Project participant response	**Date:** 01/12/2016

1. The current monitoring period of the project activity is from 01-01-2013 to 30-06-2016 and during this monitoring period the project activity has reduced net GHG emission of amount 1,66,512 tCO2e. The same has been updated in the relevant section of MR.
2. The section 1.4 has been filled with the required information.
3. Date format has been made consistent throughout the Monitoring Report.
4. Specific guideline for filling VCS-MR from monitoring report has been removed from the updated MR.
5. The text now has been made consistent throughout the MR.
6. MR APPENDIX has been removed from the revised MR.

Documentation provided by project participant

Revised MR version 02

DOE assessment	**Date:** 28/02/2017

The PP has submitted the revised MR and same was reviewed by assessment team and following information are verified :

1. The PP has updated the relevant section 1.1 of MR as provided total reduced net GHG emission of amount. Same was checked and found to be correct, hence accepted.
2. The PP has corrected the section 1.4 with the required information, hence accepted.
3. The PP has corrected the Date format throughout the revised Monitoring Report.
4. The PP has removed the Specific guideline for filling VCS-MR from revised monitoring report.
5. The PP has corrected the text throughout the MR.
6. The PP has removed the MR APPENDIX from the revised MR.

Based on review of revised MR and above corrections in MR, assessment team has confirmed that information requested are satisfactorily addressed in MR, hence CAR#1 is closed.

CAR ID	02	**Section no.**	2	**Date:**23/09/2016

Description of CAR

1. The PP is requested to provide shutdown details during the current monitoring period in section 2.1 of the MR.
2. The PP is requested to further explain energy distribution /utilization with monitoring point in the process flow diagram provided under section 2.1 of the MR as discussed during verification on-site visit and same is not consistent with last monitoring report, please clarify.

Project participant response	**Date:** 01/12/2016

1. Data for plant shutdown details are being submitted to DOE. 2. As shown in the flowchart provided in section 2.1 of the revsed MR, unit – 1 meter, unit – 2 meter and auxiliary meter are connected to total generation meter and further BCK meter, unit – 9 meter and unit -10 meter are connected to auxiliary meter. The electricity from auxiliary meter is being dispatched to BCK unit, unit 9, unit 10 and for meeting the auxiliary requirement of co-generation plant. Net auxiliary consumption of co-generation plant can be calculated by subtracting the electric units consumed by BCK unit, unit 9 and unit 10 from the units of auxiliary meter. The same has been corrected in the flow diagram too.
Documentation provided by project participant
Shut Down Details of the project activity
DOE assessment **Date:** 28/02/2017
The PP has submitted the revised MR and same was reviewed by assessment team and following information are verified : 1. The PP has provided the Shut down Details of the project activity. Same was checked and found to be correct as per site visit observations, hence accepted. 2. The PP has corrected flowchart in revised MR; with clear understanding as verified during site visit, hence accepted. Based on review of revised MR and above corrections in MR, assessment team has confirmed that information requested are satisfactorily addressed in MR, hence CAR#2 is closed.

CAR ID	03	**Section no.**	3	**Date:**23/09/2016
Description of CAR				
1. The PP is requested to provide justification of choice of data for parameter efficiency as same is mentioned not applicable in section 3.1 of the MR 2. The PP is requested to provide complete source of data as provided in last monitoring report for parameters EFcoal and EF_D under section 3.1 of the MR. 3. The PP is requested to provide measurement methods and procedures applied as per approved VCS PD for parameter D_T under section 3.1 of the MR. 4. The PP is requested clarify why the parameter "**Heat (From Steam)supply to process"** is not mentioned in section 3 of the MR 5. The PP is requested to provided monitored value of each monitoring parameter under section 3..2 of MR as per applied frequency as in VCD-DD. 6. The PP is requested to provide date of calibration of each monitoring equipment and validity calibration under section 3.2 of MR and also provide calibration certificates. 7. The PP is requested clarify why the calculation formulae is changed form previous monitoring report for Parameter $\mathbf{EG_{Net\ Aux.}}$ 8. The PP is requested to confirm the Accuracy class of monitoring equipment for parameters $\mathbf{T_{Unit-2}}$ and $\mathbf{T_{Unit-10}}$ under section 3.2 of the MR 9. The PP is requested to clarify why the Quantity of other biomass used is not listed in section 3.2 of the MR as same was mentioned in previous monitoring period MR.				
Project participant response				**Date:** 01/12/2016

1. Fixed and conservative value has been taken as per paragraph 18 (C) of the methodology. The same has been corrected in the section 3.1 of the MR
2. The source of values applied has been updated for the desired parameters in the revised MR.
3. The data has been fixed ex-ante at the time of validation and the Normative and conservative fixed value is being used.
4. The parameter **"**Heat (From Steam)supply to process**"** ($EG_{PJ,thermal,y}$) has been updated in the revised MR.
5. The year wise monitored value of all parameters have been updated in the revised version of the MR.
6. The calibration details of the parameters have been provided in the relevant section of the revised MR. Also the copy of calibration certificates as evidenced by DOE during site visit are being submitted to DOE along with the DVR response.
7. This is to request DOE that the formula is correct and can be verified with registered PD. The only thing is that in previous version of MR the formula provided was not complete as the plant has now stopped supplying electricity to Unit 9. Now the complete formula is being used which is in accordance with registered PD and the value against ECunit 9 is being taken as zero.
8. The accuracy class of the temperature sensor is 0.1%. The same has been updated in the MR.
9. The annual value of biomass used has been updated in the revised version of the MR.

Documentation provided by project participant

Copy of calibration certificates

DOE assessment | **Date:** 28/02/2017

The PP has submitted the revised MR and same was reviewed by assessment team and following information are verified :

1. The PP has clarified that the fixed and conservative value has been taken as per paragraph 18 (C) of the methodology. The same has been corrected in the section 3.1 of the MR, hence accepted.
2. The PP has updated the source of values applied for the desired parameters in the revised MR. Same was found to be correct, hence accepted.
3. The PP has clarified that the data has been fixed ex-ante at the time of validation and the Normative and conservative fixed value is being used. Same is found to be correct, hence accepted.
4. The PP has included the parameter **"**Heat (From Steam) supply to process**"** ($EG_{PJ,thermal,y}$) in the revised MR; hence accepted.
5. The PP provided the year wise monitored value of all parameters in the revised version of the MR. This was checked and found to be correct, hence accepted.
6. The PP has provided the calibration details of the parameters in the relevant section of the revised MR. Same was verified with calibration certificates and found to be correct, hence accepted.
7. The PP has clarified the formula is correct and same is verified with registered PD. The PP has provided the complete formula is being used which is in accordance with registered PD and the value against $EC_{Unit\ 9}$ is being taken as zero. Hence, accepted.
8. The PP has clarified that the accuracy class of the temperature sensor is 0.1%. The same has been updated in the MR by the PP, hence accepted.
9. The PP has provided the annual value of biomass used in the revised version of the MR. Same is found to be correct, hence accepted.

Based on review of revised MR and above corrections in MR, assessment team has confirmed that information requested are satisfactorily addressed in MR, hence CAR#3 is closed.

CAR ID	04	**Section no.**	4	**Date:**23/09/2016

Description of CAR	
1. The PP is requested to provide emission reductions sheet along with all monitoring parameter value for current monitoring period. 2. The PP is requested to clarify why the leakage calculation for month of January 2012 is provided in section 4.3 as same is not fall under the current monitoring period. Also, the table mentioned for transported biomass and estimation is found to be incomplete , please clarify ?	
Project participant response	**Date:** 01/12/2016
1. The emission Reduction sheet has been provided to DOE along with monitored data for all variable parameters. 2. This is to request DOE that the sample leakage calculation as mentioned in section 4.3 is for the month of January 2013 and under heading it was erroneously typed as 2012 instead of 2013. The same has been corrected now.	
Documentation provided by project participant	
Emission Reduction Sheet containing monitored data for all variable parameter	
DOE assessment	**Date:** 28/02/2017
The PP has submitted the ER sheet and same was reviewed by assessment team and following information are verified : 1. The PP has provided the emission reduction sheet along with all monitoring data. Same was checked and found to be correct as per site visit observations, hence accepted. 2. The PP has corrected sample leakage calculation in revised MR, hence accepted. Based on review of revised MR and above corrections in MR, assessment team has confirmed that information requested are satisfactorily addressed in MR, hence CAR#4 is closed.	

Table 3. FAR from this verification

FAR ID	N/A	**Section No.**	N/A	**Date:**N/A
Description of FAR				
N/A				
Project participant response				**Date:**N/A
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				**Date:** N/A
N/A				

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