

Verification Report of Jilin Rice Husk Thermal Energy Generation Project



BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château
92571 Neuilly Sur Seine Cdx - France

Project Title	<i>Jilin Rice Husk Thermal Energy Generation Project</i>
Version	<i>02</i>
Report ID	<i>SINGAPORE/VCS /031(03)/2012</i>

Report Title	<i>Verification Report of Jilin Rice Husk Thermal Energy Generation Project</i>
Client	<i>Wilmar International Limited</i>
Pages	<i>25</i>
Date of Issue	<i>24/03/2014</i>
Prepared By	<i>Bureau Veritas Certification Holding SAS</i>
Contact	<i>Mr. Matthieu Martini Bureau Veritas Certification Holding SAS 67/71 Boulevard du Château, 92571 Neuilly Sur Seine Cdx T: +33 (0)1 5524 7000 - F: +33 (0)1 5524 7035</i>
Approved By	<i>Mr. Robin Wang – Internal Technical Reviewer</i>
Work Carried Out By	<i>Mr. Ram M. Desai – Lead Verifier</i>

Summary:

Bureau Veritas Certification has made the verification of the Jilin Rice Husk Thermal Energy Generation Project owned by Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co. Ltd., which is located in Jilin City, Heilongjiang Province, P.R.China. Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd is a subsidiary of Wilmar International Ltd.

The Monitoring Report for 1st verification is developed by PP on the basis of Verified Carbon Standard–3.3, criteria given to provide for consistent project operations, monitoring and reporting, as well as the host country criteria.

The verification scope is defined as an independent and objective review of the VCS monitoring report and other relevant documents, and consisted of the following three phases:

- i) Desk review of the project description and monitoring plan;
- ii) Follow-up interviews with project stakeholders;
- iii) Resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Table 2. Taking into account this output, the project proponent revised the VCS monitoring report.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in the validation report and registered VCS-PD project description. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements.

Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents.

Reporting period: From 10/12/2009 to 31/12/2012

Verified emission in the above reporting period:

GHG Emission Reductions or Removals	1 st Monitoring Period (tCO ₂ e)	2 nd Monitoring Period (tCO ₂ e)	3 rd Monitoring Period (tCO ₂ e)	4 th Monitoring Period (tCO ₂ e)	Overall (1 st +2 nd +3 rd +4 th) (tCO ₂ e)
Monitoring Period Duration	10 /12/2009 – 09 /12/2010	10/12/2010 – 09/12/2011	10/12/2011 – 09/12/2012	10/12/2012 – 31/12/2012	10/12/2009 – 31/12/2012
Baseline Emissions	6,020.00	8,710.00	10,204.00	1,444.00	26,378.00
Project Emissions	0000.00	0000.00	0000.00	0000.00	0000.00
Leakage	0000.00	0000.00	0000.00	0000.00	0000.00
Net GHG emission reductions or removals	6,020.00	8,710.00	10,204.00	1,444.00	26,378.00

Table of Contents

Table of Contents	3
1 Introduction	5
1.1 Objective	5
1.2 Scope and Criteria	5
1.3 Level of assurance	5
1.4 Summary Description of the Project	6
2 Validation Process, Findings and Conclusion	7
2.1 Validation Process	7
2.2 Validation Findings	7
2.2.1 Gap Validation	7
2.2.2 Methodology Deviations	7
2.2.3 Project Description Deviations	7
2.2.4 New Project Activity Instances	7
2.3 Validation Conclusion	7
3 Verification Process	7
3.1 Method and Criteria	7
3.2 Document Review	8
3.3 Interviews	8
3.4 Site Inspections	8
3.5 Resolution of Any Material Discrepancy	11
4 Verification Findings	12
4.1 Project Implementation Status	12
4.2 Accuracy of GHG Emission Reduction or Removal Calculations	12
4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals	14
4.4 Management and Operational System	14

5	Verification conclusion	15
6	<i>Annexure - I</i>	16
7	<i>Annexure – II</i>	17
8	<i>Annexure – III</i>	18
9	<i>Annexure – IV</i>	19
10	<i>Annex V</i> VERIFICATION PROTOCOL - Verification requirements based on the Verified Carbon Standard 3.3.....	20

1 INTRODUCTION

1.1 Objective

The verification serves as project description verification and is a requirement of all VCS projects. The verification is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant VCS 3.3 and host country criteria are validated in order to confirm that the project description, as documented, is sound and reasonable, and meet the stated requirements and identified criteria. Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Verified Carbon Units (VCUs).

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the project design document/project description document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against VCS 3.3 [1] requirements and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Level of assurance

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions. Based on the process and procedure conducted, it can be concluded that the GHG assertion is materially correct and is a fair representation of GHG data and information has been prepared in accordance with the VCS 3.3 Standard [1]. The verification team consider the assurance level as 'limited' since some of the data used (e.g. Emission factor) are from the publically available databases such as the IPCC database for emission factor, for which detailed testing of GHG assertion is beyond the domain of project proponent, stake holder and the verification team.

To verify the accuracy and correctness of monitored data, verification team has utilized sampling approach. The sample size for the verification of monitored data was determined as per the International Accreditation Forum (IAF): Guidance on the Application of ISO/IEC Guide 62:1996: 'General Requirements for Bodies Operating Assessment and Certification/registration of Quality Systems'/Ref-21/. In line with the mentioned IAF guidance, the sample size from the verification body should be square root of the total sample size. Based on this approach, verification team has made a sample plan and utilized the same during verification site visit to cross check the log sheet data which is input to the calculation of $EG_{thermal}$, $B_{rice\ husk}$, $BE_{thermal,CO2,y}$ and ER_y .

The number of sample data points was selected randomly and operation log sheet of corresponding date was verified to ensure the correctness and authenticity of data monitoring and data collation practiced / followed during the said monitoring period.

	No. Of Data Points in ER Spread Sheets	Sampled Data Points
MP1	5,514*	75
MP2	6,816*	85
MP3	7,484*	87
MP4	528*	23
Total	20,342	270

Note: * Data points are determined based on the Data provided in the Spreadsheets MP1, MP2, MP3 and MP4 where basic parameters ie. Steam Temp, Steam Pressure, Feed water Temp & Enthalpy data is provided. Rests of the Parameters were verified against selected data points accordingly.

Although this sampling approach was applied during the site visit, but due to the CL01, verification team verified 100% data after PP corrected the Spread sheet and supporting boiler logs. This was done offsite and found that there is no error in recording the data and capturing it in the electronic data sheet. PP submitted necessary back up monitoring data from the Boiler operation and control panel Data Logger.

1.4 Summary Description of the Project

Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd (Project owner), a subsidiary of Wilmar International Ltd.(Project Proponent), mills rice to produce oils and grains in Jilin Province, P.R.China. Project Proponent has implemented the project titled "Jilin Rice Husk Thermal Energy Generation Project" by installing two (02) 15 MT/Hr (3.8 MPa @ 450°C), capacity biomass boilers for supplying steam to Rice Bran Plant and Paddy drying process operations in Year 2009/**Ref-1/** & **Ref-8/**.

The location of all above Rice husk Based thermal Energy generation system installed at PP's *Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd* Facility as per the registered VCS –PD **Ref-1/** is

Lat: 44°4'1.75" (N) / Long: 126°31'40.36" (E)

The project activity involves the development and operation of biomass based thermal energy generation for rice mill and refinery facility. The objective of the project activity is to provide steam to the rice bran oil extraction process, thus reducing the greenhouse gas emissions caused by the fossil fuel consumption (i.e. coal) in the absence of this project activity.

The Project activity at *Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd* is utilizing rice husk from the PP's own rice mill located in the same facility. In case there is a shortage of Rice husk PP has provision to buy the rice husk from the local Rice mills in area/**Ref-1/**.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

- Method and Criteria:
Not Applicable. The project was successfully validated by the Bureau Veritas Certification Holding S.A.S and project participant provided the validated PD/**Ref-1/** and Final Validation Report/**Ref-2/** to the verification team.
- Document Review:
Not Applicable.
- Interviews:
Not Applicable. The project was successfully validated by the Bureau Veritas Certification Holding S.A.S and project participant provided the validated PD/**Ref-1/** and Final Validation Report/**Ref-2/** to the verification team.
- Site Inspections:
Not Applicable.
- Resolution of Any Material Discrepancy:
Not Applicable

2.2 Validation Findings

2.2.1 Gap Validation

Not applicable. The project was successfully validated by the Bureau Veritas Certification Holding S.A.S and project participant provided the validated PD/**Ref-1/** and Final Validation Report **/Ref-2/** to the verification team.

2.2.2 Methodology Deviations

Not applicable, this is for verification, not validation.

2.2.3 Project Description Deviations

Not applicable, this is for verification, not validation.

2.2.4 New Project Activity Instances

Not applicable, this is for verification, not validation.

2.3 Validation Conclusion

Not applicable. The project was successfully validated by the Bureau Veritas Certification Holding S.A.S and project participant provided the validated PD **/Ref-1/** and Final Validation Report **/Ref-2/** to the verification team

3 VERIFICATION PROCESS

3.1 Method and Criteria

The overall verification, beginning from the Contract Review to Verification report, certification statement & opinion, was conducted using Bureau Veritas Certification internal procedures. The project is previously validated and registered as a VCS project with the registry. This is the 1st verification done by Bureau Veritas Certification Holding S.A.S. The verification is done based on the Monitoring Report submitted by the project proponent/**Ref-3/** & **/Ref-4/**. The verification team had visited the project site on 16/11/2012 for field visit which also include desk review, interview and discussion with the Project owner.

3.2 Document Review

The verification team has assessed the accuracy of the project description through a combination of steps consisting of review of contract related to the project activity, Scrutiny of technical specification, Calibration Reports of key monitoring equipment's, operation log sheets, monitoring records and interview of the project proponent and their representatives.

3.3 Interviews

On 16/11/2012, Bureau Veritas Certification performed site visit and conducted interviews with project proponent, and operational staff to confirm the information provided in the monitoring plan Version 1 and to resolve issues identified in the document review. Representatives of *Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd* and Wilmar International Ltd. were interviewed (Annexure IV). The main topics of the interviews are summarized in Table below.

Interviewed organization	Interview topics
- <i>Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd</i> - Wilmar International Ltd.	➤ Operational aspects ➤ Monitoring plans and Procedures. ➤ QA/ QC Procedures ➤ Internal review / verification mechanism ➤ Monitoring plans ➤ Calibration requirements ➤ Electricity monitoring ➤ Rice Husk Supply assessment ➤ Rice husk purchase during Monitoring period

3.4 Site Inspections

DOE performed onsite inspection at Project Proponent's Project location on 16/11/2012 to verify implementation of monitoring plan. During onsite visit a detailed round of Boiler facility was taken to understand the operational sequences, monitoring and measurement requirements established and followed by the Project Proponent.

Important monitoring parameters identified by Project Proponent in PD and Monitoring plan and corresponding records were considered as the input to verify the monitoring and measurement activities during this verification exercise.

Project Proponent has provided electronic monitoring devices to capture operational parameters which are linked to the Emission reduction calculations. Calibration requirements against relevant monitoring and measurement devices are defined and relevant calibration records are found maintained by Project Proponent. The calibration is done by third party and is found in line with the accuracy levels of each individual Measuring Equipment and local statutory requirements. Calibration reports are found traceable to relevant national / international standards.

Authenticity of calibration was specially verified against important project monitoring equipment's i.e. Steam Flow meter, Temperature and Pressure sensors etc.

Following important parameters are monitored and operational logs **/Ref-12/** are maintained to demonstrate that the monitoring mechanism is conforming to the defined frequency as mentioned in the table given below.

Operational Parameter	Data Parameter as per monitoring plan	Frequency of Monitoring	Monitoring arrangement	Accuracy Class and Calibration Frequency and status
Temperature of Steam	Temp_{Steam,JIL_B01} (Metering point # 05 in Process flow diagram given in Section 5 of Monitoring Report)	Hourly	Temperature sensors are provided on the Steam line delivering steam to Header 1. Sensors are connected to transmitters and online monitoring is in place. The data is recorded in the system and then transferred to the Daily Operational Log on Hourly basis and this data is used in the Emission reduction calculation spread sheet, which is provided by PP for verification.	- Accuracy Class –II - Calibration Frequency – Annual - Calibration Status MP 01 : Factory Calibration, valid at installation MP 02 : 17/10/2010 MP 03 : 16/10/2011 MP 04 : 15/10/2012 - Traceability to national / international standards is established and found satisfactory
	Temp_{Steam,JIL_B02} (Metering point # 06 in Process flow diagram given in Section 5 of Monitoring Report)		The data provided in the Emission reduction spread sheet was cross checked by the verification team during site visit (adopting the Sampling approach as mentioned in the Section 1.3 of this verification report) against the basic data obtained from the system in daily operational log sheets and found correctly applied. There is no discrepancy in the data monitoring, recording and calculation observed.	
Pressure of steam	P_{Steam,JIL_B01} (Metering point # 05 in Process flow diagram given in Section 5 of Monitoring Report)	Hourly Monitored (Average Daily quantity is used for calculations)	Pressure sensors are provided on the Steam line delivering steam to Header 1. Sensors are connected to transmitters and online monitoring is in place. The data is recorded in the system and then transferred to the Daily Operational Log on Hourly basis and this data is used in the Emission reduction calculation spread sheet, which is provided by PP for verification.	- Accuracy Class – 0.075% - Calibration Frequency – Annual - Calibration Status MP 01 : Factory Calibration, valid at installation MP 02 : 17/10/2010 MP 03 : 16/10/2011 MP 04 : 15/10/2012 - Traceability to national / international standards is established and found satisfactory
	P_{Steam,JIL_B02} (Metering point # 06 in Process flow diagram given in Section 5 of Monitoring Report)		The data provided in the Emission reduction spread sheet was cross checked by the verification team during site visit (adopting the Sampling approach as mentioned in the Section 1.3 of this verification report) against the basic data obtained from the system in daily operational log sheets and found correctly applied. There is no discrepancy in the data monitoring, recording and calculation observed.	
Temperature of Feed water of Boiler	Temp_{FeedWater,JIL_B01} (Metering point # 04 in Process flow diagram given in Section 5 of Monitoring Report)	Hourly	Temperature sensors are provided on the Feed Water Line supplying water to both Boilers. Sensors are connected to transmitters and online monitoring is in place. The data is recorded in the system and then transferred to the Daily Operational Log on Hourly basis and this data is used in the Emission reduction calculation spread sheet, which is provided by PP for verification.	- Accuracy Class – B - Calibration Frequency – Annual - Calibration Status MP 01 : Factory Calibration, valid at installation MP 02 : 17/10/2010 MP 03 : 16/10/2011 MP 04 : 15/10/2012 - Traceability to national / international standards is established and found satisfactory
	Temp_{FeedWater,JIL-B02} (Metering point # 04 in Process flow diagram given in Section 5 of Monitoring Report)		The data provided in the Emission reduction spread sheet was cross checked by the verification team during site visit (adopting the Sampling approach as mentioned in the Section 1.3 of this verification report) against the basic data obtained from the system in daily operational log sheets and found correctly applied. There is no discrepancy in the data monitoring, recording and calculation observed.	

Total Quantity of Steam delivered by Boiler 01	FL_{steam,OEP} (Metering point #08 in Process flow diagram given in Section 5 of Monitoring Report)	Daily	Steam Flow meters are strategically located on each individual steam delivery line supplying steam to Refinery Oil Extraction Plant (OEP) and delivery line supplying steam to Drying Tower (DT). Verified on site installations and cross checked the actual reading at the instrument and at PLC monitor. There is no error / loss observed.	- Accuracy Class – 1% - Calibration Frequency – Annual - Calibration Status MP 01 : Factory Calibration, valid at installation MP 02 : 17/10/2010 MP 03 : 16/10/2011 MP 04 : 15/10/2012 - Traceability to national / international standards is established and found satisfactory
	FL_{steam,DT} (Metering point #09 in Process flow diagram given in Section 5 of Monitoring Report)			
Total Quantity of Biomass	RH_{total} (Metering point #02 & 03 in Process flow diagram given in Section 5 of Monitoring Report)	Continuous	On line air lock system based flow meters are installed before each boiler. The rice husk feeder takes rice husk from the individual silo and push it through the Air lock system based flow meter, which sense the flow of Rice husk in the combustion chute and provides signal to the PLC System, inbuilt software calculates the quantity in terms of MT and records it in the system, using empirical formula provided by the Manufacturer. This is demonstrated transparently during site visit and is found verifiable.	- Accuracy Class – NA - Calibration Frequency – NA - Calibration Status - NA
Annual quantity of rice husk produced and delivered from rice mills to intermediate storage silos	RH_{internal} (Metering point #01 in Process flow diagram given in Section 5 of Monitoring Report)	Continuous	The quantity of rice husk generated is an estimated value based on the paddy processed by the Rice mill, PP has shown the records of Paddy processed during the monitoring period during onsite visit. Verification team cross checked the quantity of Rice husk generated presented in the Monitoring report and found it is in accordance with the Paddy processing records, which also a part of daily and monthly production report.	- Accuracy Class – NA - Calibration Frequency – NA - Calibration Status - NA
Quantity of rice husk sourced within 200 km radius from the project	RH_{regional}	As and when there is a shortage of internal rice husk supply	NA	- Accuracy Class – NA - Calibration Frequency – NA - Calibration Status - NA
Daily operational Hours of Boilers	HR_{JIL_B01}	Daily	Operation hours of each boiler are recorded in the daily log sheet and this record is used to arrive at total operational hours of each boiler during the monitoring period.	- Accuracy Class – NA - Calibration Frequency – NA - Calibration Status - NA
	HR_{JIL_B02}			

Daily operational log/**Ref-12/** sheets were verified for the 1st monitoring period i.e. 10/12/2009 – 31/12/2012 in detailed. Data found authentic and is found correctly captured for calculating Emission reduction calculation in the defined ER Calculation Sheet (Excel Sheet)/**Ref-5/**. ER Calculation (Excel sheet) data was tallied with operational log sheets and found meeting the requirements.

Specific Records verified during site visit are listed as below

- **Boiler Operation logs:**

Capturing information such as Feed Water Temperature, Feed Water Pressure, Temperature of Steam, Pressure of Steam, which are monitored on hourly basis and an average of hourly readings, are taken to compile daily reports. Values represented in the Boiler Daily report/**Ref-12/** are found correctly captured and recorded. Boiler operators are found aware of the monitoring requirements and are found competent enough to operate, maintain and monitor the important

parameters of boiler operations. A PLC system is in place to capture and record boiler operational parameters in a transparent manner and hence good level of reliability can be established on the values monitored and recorded to arrive at emission reductions during the said monitoring period.

- **Rice Husk consumption:**

Quantity of rice husk received at the project site through dedicated pipeline network from Rice mill in operation in the same premises of *Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co. Ltd.* is being monitored. PP has a system of recording the quantity of rice husk consumed as fuel in both project boilers/**Ref-18/**. The quantity of Rice husk consumed by the Boiler is monitored using load cells and a separate electronic weighing system fitted to intermediate storage silos where Rice husks is stored prior feeding to boilers. This has been transparently monitored using PLC system and the data is logged in the monthly logs.

Maintenance regime is established by Project Proponent to ensure that project equipment's are operational and there is no hindrance in achieving estimated emission reduction due to implementation of the project activity. Annual Maintenance contract with boiler suppliers is established, records pertaining to the routine maintenance checks are maintained satisfactorily. There is no break down reported since commissioning of boiler.

Performance of boiler in terms of steam generation found stabilized and generating consistent quantity and quality of steam required for the operation of Refinery.

3.5 Resolution of Any Material Discrepancy

The verification team could not see any critical material discrepancy during the verification except few clarifications. All issues were settled by the PP, and accepted by the verification team.

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

Findings established during the initial verification could either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CAR) is issued, where:

- (a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- (b) Mistakes have been made in applying assumptions, data or calculations of emission reductions, which will impair the estimate of emission reductions;
- (c) Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

Forward Action Requests (FAR) are issued, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable VCS 3.3 requirements have been met.

The verification team as explained above reviewed the project description document (VCS PD) and previous verification report were made available by the PP prior to onsite verification visit to site, required under VCS, monitoring report and the emission reduction calculations. For the verification of the information provided in these documents, necessary interviews and supporting documentation were accessed and verified by the team. These included internal plant log sheets for monitored data/ parameter, Calibration records for the measuring devices used for Monitoring etc.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Table 2.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The Project activity involves installation of rice husk based steam boilers with rated capacity of 15 MT/Hr (3.8 MPa @ 450°C) X 02 **/Ref-8/**. The main purpose of the project activity is to reduce the GHG gas emissions by generating clean Thermal Energy in the form of Steam utilizing Rice husk as fuel, completely displacing fossil fuel i.e. Coal. During the monitoring period (10/12/2009 to 31/12/2012) the project activity has consumed 39518.11 MT of Rice Husk as biomass fuel to generate 105,919 MT / 278.84 TJ of Steam**/Ref-5/**.

During site visit it is verified and confirmed that PP has implemented project activities in line with the description mentioned in the registered PD**/Ref-1/** and it can be confirmed that there is no change in the key equipment since the validation of the project w.r.t. the design and operational pattern **/Ref-6/ & /Ref-9/**.

All raised CLs were successfully closed during the validation and 1st verification of the project activity. There are no remaining issues from the previous verification. The verification has been carried out based on the Monitoring Report and emission reduction calculation sheet submitted by the project participant as well as validated VCS PD **/Ref-1/** and VCS-Validation Report**/Ref-2/**. The monitoring period for this verification was considered as 10/12/2009 to 31/12/2012 and the emission reductions have been accounted for this assessment period as presented herewith.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The values of the Baseline emissions and Emission reductions are depending upon the net Quantity of Steam generation and the quantity of Rice husk consumed by the project activity.

The project emissions are considered as “Zero” based on the registered PD **/Ref-1/** and Validation report **/Ref-2/**.

Leakage is considered to be zero as per applied methodology since there is no equipment is transferred from another activity as well as the Biomass which is getting used in the project activity as fuel is sourced from the rice mill owned and operated by project owner in the same premises. There is no rice husk purchased from the outside rice mills during this Monitoring

period **/Ref-16/**. Registered PD **/Ref-1/** has established monitoring parameter “**RH_{regional}**”**/Ref-14/**, **/Ref-15/** & **/Ref-16/**, in case there is a shortage of the rice husk from the internal rice mill then PP can purchase it from outside rice mills, and before doing so PP shall perform a survey of rice husk to determine the availability of rice husk within 200km perimeter from project location to estimate the Transport Emissions. However during this monitoring period it was observed that PP has not purchased any Rice husk from outside rice mills. This was verified using purchase and sales records of rice husk, in fact it was observed that PP has made sale of the excess rice husk produced internally. From the evidences it is concluded that Survey is not required as the internally generated rice husk is sufficient to cater the fuel requirement of all three biomass boilers during this monitoring period. Therefore Emission reductions due to implementation of the project activity are calculated using following formula.

$$ER_y = BE_y - PE_y - L_y$$

- Baseline Emission $BE_y = (EG_{thermal} / \eta_{BL}) * EF_{FF,CO2}$
- $EG_{thermal}$ – Total Net Steam Supplied to the Refinery facility = 278.84 TJ (this includes all two boilers)
- EF_y – Baseline emission factor for Coal = 94.6 tCO₂/TJ
- PE_y – Electricity consumption = 0
- $L_y = 0$
- Baseline emission and Emission reduction are calculated as per the step by step approach presented in the registered PD**/Ref-1/** Section 3.4 and monitoring report section 4.1 i.e. through Step 1 to Step 4. Verification team has, verified the calculation in detailed and observed that while calculating baseline emissions PP has utilized monitored values of Feed Water Temperature, Steam Temperature, Steam Pressure and Steam flow. These values are found transparently presented in the emission reduction spread sheet. Verification team has cross checked these values using Boiler operation logs and current actual values from the PLC system during site visit, hence found conservative. Further it was noted that PP has excluded those days from the emission reduction calculation where Boilers was not in operation and the monitoring equipment's are faulty. This is also found transparently recorded in the operation logs and PLC system which is found verifiable. The summary of such incidences is provided in the Monitoring report Section 4.1; this is verified during site visit and found correct. There is no discrepancy noted in the representation and the actual data monitored during overall monitoring period.
- Project emissions (PE_y) are considered as “Zero”, **/Ref-1/** and **/Ref-2/**, hence quantity of baseline emissions (BE_y) are equal to emission reduction (ER_y). This is found in accordance with Registered PD **/Ref-1/**.

The total net Steam Supplied by both biomass Boilers to Rice Bran Plant and Paddy Drying process during monitoring period is 105,919 MT, and Total Rice Husk consumption during this monitoring period is 39,518 MT **/Ref-14/**, **/Ref-15/** & **/Ref-16/**. The calculation of emission reductions is found to be accurate and fairly stated. The spread sheet formulae are correctly applied, conversions are correct and there are no manual errors noticed while verifying monitoring data. The emission factor for the coal is already fixed ex ante taken from IPCC (94.6 tCO₂/TJ) [5] and the same is correctly applied in the calculation of emission reductions. There is no evidence of major loss of generation data within the said monitoring period.

The monitoring period considered for this VCS verification is from 10th December 2009 to 31st December 2012 (both days inclusive).

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Provisions for emission reduction monitoring and calculation are made in the Monitoring plan. During verification visit Verification Team verified that all these arrangements are in line with both approved methodologies selected by Project Proponent for development of this project. Verification details for emission reduction against each approved methodology are given as below.

A. As per AMS I.C Ver 16

The emission reductions are being claimed for Thermal Energy Generation in the form of Steam. As described in AMS IC, Ver. 16, $EG_{thermal,y}$ is taken considering installed rated capacity of boilers (i.e. 15 MT/Hr X 2 Nos.). As per AMS IC, Ver. 16 [4], a default value of 100% is taken as the efficiency of the coal based baseline plant that would have been used in the absence of the project, which validated and verified for the authenticity through boiler design parameters.

CO₂ emission factor for coal has been taken from IPCC 2006 data and project proponent has utilized correct value i.e. 94.6 tCO₂/TJ for coal while calculating emission reduction. The steam generation values have been checked with the purchase order of steam boilers and found to be correct. The CO₂ EF is taken from a reliable source.

Enthalpy values are taken from steam tables. The emission reductions from steam generated works out to be 26,378 tCO₂e **/Ref-5/** for the entire monitoring period. The verification team is of the opinion that the emission reduction calculations are correct and they are as per requirements of AMS IC Ver. 16. The verification team checked the Boiler inspection records. These records found in accordance with the requirement of local statutory guidelines for boiler installation. PP has engaged trained boiler operators for the operation of boiler, verified certificates of qualified boiler operators.

There were few instances of meter change and failure noticed within this monitoring period (for those parameters which are part of the monitoring plan), however PP has excluded those dates / instances from the calculation of Emission reductions to avoid any uncertainty due to faulty monitoring equipment. The team verified the authenticity of the monitoring during such periods in detail and found that it is transparently demonstrated through Boiler operation and maintenance logs, hence found reliable and correct.

4.4 Management and Operational System

The Management System for the project and the organisation structures with the responsibilities has been properly identified and are in place as per the quality management system documentation. The operation and maintenance of the Rice husk based Steam Boiler and ancillary equipment's is with the PP i.e. Wilmar international Limited and Yihai Kerry (Jilin) Oils, Grains, and Food stuff Industries Co. Ltd. The daily Steam Generation, Rice husk Consumption, Feed Water Temperature, Steam Temperature and Pressure etc are monitored by competent personnel and reported to the Manager – Production for further review. The readings are recorded manually in the daily log sheet formats as stated in the monitoring plan. Periodic review is a regular practice established by PP to ensure the quality assurance on the data generation and monitoring. The data uncertainty level of the collected data is found satisfactory, considerable reliability can be placed on the operators and monitoring devices.

Mechanism for Boiler Maintenance is in place, PP has signed a maintenance contract with the boiler supplier and quarterly preventive maintenance records are seen during Verification Visit. From the physical observation verification team is of the opinion that PP has maintained the condition of all Project equipment's and there is no equipment found under breakdown.

5 VERIFICATION CONCLUSION

Bureau Veritas Certification has performed a verification of the "Jilin Rice Husk Thermal Energy Generation Project" at Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd.. The verification was performed against established criteria i.e. Verified Carbon Standard, Host country requirements and project operation, monitoring and reporting requirement specified in the PD. The verification consists of following three phases:

- i) Desk review of the project design and the baseline and monitoring plan;
- ii) Follow-up interviews with project stakeholders;
- iii) Resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Willmar International Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis of Monitoring Parameters set out within the project Monitoring and Verification Plan indicated in the VCS PD Version 1 Dated 27/08/2010. The development and maintenance of records and reporting procedures are found in accordance with the plan. Monitoring Plan also includes the calculation and determination of GHG emission reductions from the project, and the responsibility is assigned to the Site management of the project.

Bureau Veritas Certification has verified the content of the project monitoring report carefully for the said reporting period as indicated below. Bureau Veritas Certification Holding S.A.S confirms that the project is implemented as described in the Project Design Document. The Thermal energy generation system utilizing rice husk as fuel and associated equipment's such as control systems, Steam Flow monitoring, Pressure and temperature monitoring, Rice husk quantity monitoring are being operated and maintained in accordance with standard practices and procedures. All Project relevant parameter monitoring devices are found suitably calibrated. The monitoring system is in place and the project has started generating GHG emission reductions.

Bureau Veritas Certification Holding S.A.S can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring plans, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 10/12/2009 to 31/12/2012 Verified emission in the above reporting period:

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	26,378.00
Project Emissions	00,000.00
Leakage	00,000.00
Net GHG emission reductions or removals	26,378.00

6 ANNEXURE I

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
GHG	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
PD	Project Document
PP	Project Proponent
UNFCCC	United Nations Framework Convention for Climate Change
VCS - I	Verified Carbon Standard, version 1
VCS	Verified Carbon Standard
VCU	Verified Carbon Units
%	Percentage
MT	Metric Tonne
EF	Emission Factor
ER	Emission Reduction
LE	Leakage Emissions
BE	Baseline Emissions
PE	Project Emissions
km	Kilo Meter
MPa	Megapascal
kW	Kilo Watt
MP	Monitoring Plan

7 ANNEXURE – II

Curriculum vitae of the DOE's verification team members

Mr. Robin Wang Jing: *(Internal Reviewer)*

Bureau Veritas Certification, China

CDM Lead Verifier He holds a Bachelor Degree in Gas & Heating Engineering. He was a Gas Engineer with over 10 years' experiences in oil and gas sector and building technology in P.R. China. Before joining BV in 2007, he gained two years of CDM audit experience in P.R China. He obtained the certificate of CDM Verifier, Lead Auditor for ISO 14001 and completed the course assessment for the ISO 14064:2006.

Ram M. Desai *(Lead Verifier)*

Bureau Veritas Certification, Singapore,

Environmental Engineer with over all 13 years of experience in various industries related to Water & Waste water engineering design, installation & Commissioning, Integrated Facility Management for Environmental Services operations in various industries i.e. Automotive, Pharmaceutical, IT & Electronics (With Clean Room).

Management System Implementation and Maintenance, Green Building concept implementation, Lean Management Implementation, Water & Waste Water Engineering Design & project Management, Project Environmental Compliance etc. for a construction company. He is the lead auditor for Environment management system, Quality management system and Occupational health and safety management system and his auditing experience spans for 3 year with BVCI & BVCS.

He has undergone intensive training on Clean Development Mechanism and was trained as Lead Verifier for CDM in the year 2005 and working as a lead Verifier for validation and verification of CDM/ VCS Projects.

8 ANNEXURE – III

References

Category 1 Documents:

Documents provided by project participants that relate directly to the GHG components of the project.

- /Ref-1/ VCS Registered PD, Version 1 Dtd. 27/08/2010
- /Ref-2/ VCS Validation Report, Dated 29/10/2010
- /Ref-3/ VCS Monitoring Report for the 1st Monitoring Period, Version 1
- /Ref-4/ VCS Monitoring Report for the 1st Monitoring Period, Version 2
- /Ref-5/ Emission Reduction spread Sheet
- /Ref-6/ Rice Husk Boiler Design Agreement Signed with Jilin Industrial University
- /Ref-7/ Business License of Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co., Ltd
- /Ref-8/ Purchase contract for two 15 MT/hour rice husk boilers
- /Ref-9/ Technical Specification of all two boilers
- /Ref-10/ Steam Table:
<http://www.spiraxsarco.com/resources/steam-tables/superheated-steam.asp>
- /Ref-11/ Boiler Commissioning Report Dtd. 22/11/2009
- /Ref-12/ Boiler operation Daily log sheet
- /Ref-13/ Calibration Summary Report
- /Ref-14/ Calibration records of individual monitoring equipment's and instruments
- /Ref-15/ Rice mill Daily production report
- /Ref-16/ Rice mill Monthly production report
- /Ref-17/ Rice Husk Sale Records
- /Ref-18/ Rice Husk Consumption for two Boilers based on the PLC Data.
- /Ref-19/ Empirical formula provided by Manufacturer of online air lock system based rice husk flow meter for conversion to MT Quantity.
- /Ref-20/ Boiler inspection reports
- /Ref-21/ Guidance on the Application of ISO/IEC Guide 62:1996: 'General Requirements for Bodies Operating Assessment and Certification/registration of Quality Systems
- /Ref-22/
- /Ref-23/
- /Ref-24/

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents used for cross-check.

- [1] VCS Standard 3.3
- [2] VCS Monitoring Report Template
- [3] VCS Verification Report Template
- [4] AMS IC, Version 16 "Thermal energy production with or without electricity"
- [5] IPCC Default values 2006 for Coal
- [6]
- [7]

9 ANNEXURE – IV

Persons interviewed:

Persons interviewed during the verification or persons that contributed with other information that are not included in the documents listed above.

Wilmar International Ltd. & Yihai Kerry (Jilin) Oils, Grains, and Foodstuffs Industries Co.Ltd.

/1/	Mr. Bai Jingyu	Production Manager
/2/	Mr. Joshua Lim	Process Manager
/3/	Mr. Lee Kok Vui	Technical
/4/	Mr. Li Bin	Production Supervisor
/5/		
/6/		
/7/		
/8/		

10 ANNEX V VERIFICATION PROTOCOL - VERIFICATION REQUIREMENTS BASED ON THE VERIFIED CARBON STANDARD 3.3

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
<i>Project implementation in accordance with the registered project document</i>			
Are all physical features of the proposed VCS project proposed in the registered PD in place?	As per the PD, the project activity is a biomass based Thermal energy generation project comprising of two 15 MT/ hour green field rice husk based boiler with steam parameters, 3.8 MPa @ 450°C respectively, and relevant ancillaries for air pollution control, Rice husk storage and conveyor mechanism, electrical control panel, Steam Monitoring system etc. Biomass fired in the boiler, as per the PD, is only rice husk, it is verified that the project activity is functioning as described in the PD. All physical features referred in the PD Version 1 were verified and found in line with Project Delineation for Baseline Scenario (Figure-4) and Project Delineation for Project Activity of PD Section 2.3	OK	OK
Have the project participants operated the proposed VCS project as per the registered PD?	The steam generated from the project is utilized for internal consumption for Rice bran Plant and Paddy drying Processes. Yes the proposed VCS project is being in operation since 10 December 2009 and it is found in accordance with the registered PD.	OK	OK
Was an on-site visit conducted?	Yes, On site date for Verification is 16/11/2012 utilizing one (01) verifier.	OK	OK
If not, justify the rationale of the decision.	Not Applicable	-	-
Does the implementation or operation of VCS project conform with the description contained in the registered PD?	Yes the project activities, Technology, equipment selection and monitoring methodologies are in line with the description contained in the registered PD.	OK	OK
If not, which are the potential impacts due to these changes?	Not Applicable	-	-

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
<i>Compliance of the monitoring plan with the monitoring methodology</i>			
Is the validated monitoring plan in accordance with the approved methodology applied by the proposed VCS project?	As per the applied methodology –AMS IC, version 16, the following is required to be monitored for the project activity: Metering the thermal and/or electrical energy produced. In the case of steam energy, direct measurement of flow, temperature, and pressure is required to determine enthalpy of the steam. For projects where only biomass or biomass fossil fuels are used the amount of biomass and fossil fuel input shall be monitored. The monitoring plan implemented is as per the methodology AMS IC version 16 and above mentioned parameters a & b are being monitored. Same has been confirmed during site visit. Yes Verified the monitoring plan and found it is in line with the requirement of both approved methodologies applied by the proposed VCS Project	OK	OK
Are there any monitoring aspects of the project that are not specified in the methodology (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?	Not Applicable	-	-
<i>Compliance of monitoring with the monitoring plan</i>			
Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	Yes, it is evident during onsite visit. Operational parameters defined in the Monitoring plan to arrive at GHG Emission reduction calculation are captured in the daily log sheets. Separate calculation spreadsheets are maintained to arrive at final GHG emission reduction using approved factors and relevant operational data from Log sheets. Mechanism for Calibration of relevant operational and monitoring equipments is established and found effective.	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
Have all parameters stated in the monitoring plan, the applied methodology been sufficiently monitored and updated as applicable, including:	Yes Monitoring plan found covering all relevant parameters mentioned in the applied methodologies.	OK	OK
Project emission parameters?	There is no project emissions accounted, this is found in accordance with the registered PD.	OK	OK
Baseline emission parameters?	From the site visit it is found that the parameters being monitored on a continuous basis are- Process steam which is supplied to Rice Bran Plant and Paddy Drying Processes is monitored for flow. Quantity of Rice husk usage Baseline emission for project activity calculated ex-ante in the PD was 66,148 tCO₂e VCU's for the period of 2009 - 2012 with coal emission factor of 94.6 tons CO₂/TJ. And the monitoring report indicates emission reduction of 26,378.00 tCO₂e monitoring period of 10/12/2009 to 31/12/2012. From the verification of Emission reduction calculation it is observed that the presented ER are conservative.	OK	OK
Leakage parameters?	NA, as the Rice husk is sourced from the internal rice mill operating in the same premises where project activity is implemented. There is no additional rice husk purchased from outside during this monitoring period.	OK	OK
Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	Management and operational system has been satisfactorily defined in the monitoring report. Production Manager is responsible for project related operation and maintenance activities and subsequent monitoring and measurement activities as defined in the monitoring plan.	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
Are equipment controlled and calibrated in accordance with the monitoring plan?	Calibration details of meters used for measuring Steam flow Meters Temperature and Pressure meters Have been provided for the monitoring period.	OK	OK
Are monitoring results consistently recorded as per approved frequency?	Yes recording of data is consistent with that mentioned in the PD and was verified during site visit. CL-01 Pending for Closure	CL01	OK
Have quality assurance and quality control procedures been applied in accordance with the monitoring plan?	Yes QA/QC procedures have been applied as per the monitoring plan of registered PD. CL01 Pending for Closure	CL01	OK
<i>Assessment of data and calculation of greenhouse gas emission reductions</i>			
Is a complete set of data for the specified monitoring period available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the validator shall make the most conservative assumption theoretically possible in finalizing the verification report).	Monitoring Plan found mentioning monitoring Period as 10/12/2009 – 31/12/2012, with actual start date as 22/11/2009. From the operational data verified in the form of log sheets for the monitoring period it is concluded that monitoring plan in in accordance with the registered PD. CL01 is pending for closure	CL01	OK
Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	Yes the monitoring report has been cross -verified at the site with logbooks, and rice husk production records, Rice husk Sales Contracts, Boiler Specifications etc.	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
Have calculations of baseline emissions, proposed project emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	Yes the calculations are in accordance with the formulae and methods described in monitoring plan and applied methodology.	OK	OK
Have any assumptions used in emission calculations been justified?	Yes assumptions have been justified in the registered PD. Same values have been used in the monitoring report submitted during Verification Visit.	OK	OK
Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	Yes	OK	OK

(Table 2) CAR & CL List:

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Verification team conclusion
CL- 01 While Verifying the monitored values for various important Monitoring parameters shown in the ER Spread sheet and actual monitored value from boiler operation log books, it was observed that several values are not tallying with the values used in the ER spread sheet for calculating emission reductions. The Sampled data showed error of almost 12.5%. Please clarify how the quality control on the monitoring plan is effective in addressing data inaccuracies.	By following internal procedures in the Quality Assurance / Quality Control (QA/QC) for the duties of the supervisor, the PP has identified data entry errors and corrected them. The Monitoring Report uses data that has undergone the QA/QC checks and been corrected.	The monitoring data was reverified thoroughly to verify that there is no error in the reported data. There is no sampling applied on correction of the data, 100% data was verified and found correct, PP submitted back up data for this verification and found no error. Hence it confirmed that the quality control is now improved and needs followed consistently. Based on the verified Data the CL 01 is closed
CL-02: As per the Registered PD it is mentioned that the project will be implemented in two phases, During site visit commissioning certificate of Boiler 1 was submitted for verification (Dtd. 22/11/2009). However there is no commissioning report for Boiler 2 made available during site visit. Please Provide details of commissioning of 2nd Boiler to confirm the start date and emission reductions achieved due to operation of Boiler 2	Boiler 1 and 2 were commissioned together on the same period as shown in commissioning report by boiler suppliers.- A copy of correct commissioning report is submitted herewith for the review.	Verified Correct Commissioning report, which shows the Date of commissioning of both boilers as same i.e. 22/11/2009, hence it is confirmed that the start date of monitoring period applied by PP is correct. Based on the submitted evidence the CL 02 is closed