



**Verified Carbon
Standard**

HYDROELECTRIC PROJECT IN KINNAUR DISTRICT IN HIMACHAL PRADESH



South Asia

TÜV SÜD South Asia Pvt Ltd

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Summary:

TÜV SÜD South Asia Pvt. Ltd. has performed the fourth verification of the aforementioned VCS project activity. The verification is based on the currently valid documentation of the VCS and United Nations Framework Convention on Climate Change (UNFCCC).

The Verification has been conducted for the monitoring period 01-January-2014 to 31-August-2015.

The verification process includes three phases:

- Desk review of documents;
- On-site audit and follow-up interviews with the relevant personnel;
- Resolution of outstanding issues and the issuance of final verification report and opinion.

The project activity is 1000 MW run of the river hydro power plant harnessing the potential of river Sutlej executed by Jaypee Karcham Hydro Corporation Limited (JKHCL). The project activity is located between Karcham and Wangtoo in Kinnaur district of Himachal Pradesh. The project comprises 4 X 250 MW units in an underground power house for the generation of clean electricity. The generate d electricity is fed into NEWNE (Now Indian) grid. The project leads to reduction of greenhouse gas emissions by replacing an equivalent amount of energy generated from fossil fuel intensive thermal power plants to meet the energy requirement.

The project was initially implemented by Jaypee Karcham Hydro Corporation Limited (JKHCL) by the promoter group Jaiprakash Industries Limited (formally Jaiprakash Associated Limited). Afterwards Jaypee Karcham Hydro Corporation Limited was merged to newly formed Jaiprakash Power Ventures Ltd (JPVL). Further, 11-September-2015 onwards, the Himachal Baspa Power Company Ltd. (HBPCL) has owned the power plant and thus new owner was acting as project proponent for the proposed project activity. However, on 11-September-2018, the name change process have been completed and thus, Himachal Baspa Power Company Ltd. (HBPCL) company name have been changed to JSW Hydro Energy Limited. Supporting document dated 11-September-2018 from Registrar of Companies (ROC), Ministry of Corporate Affairs, Govt. of India have been submitted by PP and found correct.

The project is registered with UNFCCC under Clean Development Mechanism program (CDM) with Registration reference number 4993¹. The start date of the project activity is the earliest date of commissioning of the 1st 250 MW plant unit (unit-1) involved in the project activity i.e. on 26-May-2011. The fixed crediting period is chosen from 01-January-2013 to 31-December-2022.

¹ <http://cdm.unfccc.int/Projects/DB/RWTUV1310469729.49/view>

The GHG credits from 01-January-2014 to 31-August-2015 will be claimed under VCS only. An undertaking dated 09-August-2021 from the project participant confirms that project will not claim any other scheme benefits for the concerned monitoring period.

2. 7 Clarification Requests (CLs) have been raised during the course of verification process and has been successfully closed. No Corrective Action Request (CAR) and Forward Action Request (FAR) was raised during this monitoring period.

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1 INTRODUCTION

1.1 Objective

TÜV SÜD has been commissioned by the aforementioned client to perform an independent verification assessment.

The objective of the verification work is to comply with the requirements of Verified Carbon Standards requirements. According to this assessment TÜV SÜD shall:

- ensure that the project activity has been implemented and operated as per the registered PDD, and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place,
- the project's baseline is assessed against “ACM0002 - Version 12.1.0”
- the project's monitoring plan is assessed against “ACM0002 - Version 12.1.0”
- ensure that the published MR and other supporting documents provided are complete, verifiable and in accordance with applicable VCS and CDM VVS requirements,
- ensure that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology,
- evaluate the data recorded and stored as per the applicable requirements.
- assessment of the sustainability monitoring parameters as per the VCS requirements

1.2 Scope and Criteria

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of VCS project activities, the scope is set by:

- VCS v4.0 requirements
- Clean Development Mechanism Validation and Verification Standard (VVS) for Project Activities v2.0
- Baselines and monitoring methodologies (including GHG inventories)
- Environmental issues relevant to the applicable sectoral scope
- Current technical and operational knowledge of the specific sectoral scope and information on best practice
- Stakeholder consultation and feedback

The verification process is not meant to provide any form of consulting for the project participant (PP). However, stated requests for clarifications, corrective actions, and/or forward actions may provide input for improvement of the project design.

1.3 Level of Assurance

Indicate the level of assurance of the verification. The errors identified in the project are below the threshold limit of materiality and hence not material. The GHG emission reductions are calculated without material misstatements.

The WB confirms that a reasonable level of assurance has been achieved during the verification process.

1.4 Summary Description of the Project

The purpose of the project activity is to generate energy electricity by the utilization of hydro power and further selling the generated energy to the respective Grid. In this process there is no consumption of any fossil fuel and hence it does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

The project activity is 1000 MW run of the river hydro power plant harnessing the potential of river Sutlej executed by Jaypee Karcham Hydro Corporation Limited (JKHCL) & after 11-September-2015 onwards, owned by Himachal Baspa Power Company Ltd. (HBPCL). However, on September-2018, the company name have been changed from Himachal Baspa Power Company Ltd. (HBPCL) to JSW Hydro Energy Limited. The project activity is located between Karcham and Wangtoo in Kinnaur district of Himachal Pradesh. The project comprises 4 X 250 MW units in an underground power house for the generation of clean electricity. The generated electricity is fed into NEWNE grid (Now Indian grid). The project leads to reduction of greenhouse gas emissions by replacing an equivalent amount of energy generated from fossil fuel intensive thermal power plants to meet the energy requirement.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The information provided by the project participants is assessed by applying the means of verification specified in the VCS v4, Toolkit and the VVS.

A competent assessment team is selected prior to the start of the verification. The team is selected to cover the technical area(s), sectoral scope(s) and relevant host country experience for evaluating the VCS project activity. Additionally, a competent Technical Reviewer or Technical Reviewer Team is appointed to conduct checks on quality and completeness.

The verification team performs first a desk review, followed by an on-site visit, which results in the formation of a draft report and a list of findings. The next step involves the evaluation of the findings through direct communication with the PPs and then finally the preparation of the verification report. This verification report and other supporting documents then undergo an internal quality control by the CB "Environment and energy" before submission to the VCS.

2.2 Document Review

The documents referred during the course of this verification are provided in Appendix 1.

2.3 Interviews

The VVB has not conducted the on-site inspection for this current monitoring period due to obligations imposed by COVID 19. However the VVB has ensured that reasonable level of assurance has been achieved as per Verra regulations on the relaxation of mandatory site visits by the VVB due to Covid-19. The VVB has conducted telephonic interviews and video calls to discuss with the client regarding the data and documents pertaining to the current verification period. The interviews and discussions were conducted successfully.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Thakur	Anil Kumar	Plant Engineer, JSW (PP Representative)	12-February-2021	Implementation of the project, O&M activities, Metering arrangements, Calibrations, JMR, On-going LSC. etc.	Rekha Menon
2	Sharma	Vikas	Sr. Engineer, JSW	12-February-2021	Plant technology and monitoring	Rekha Menon
3	Mitra	Souvik	EKI Energy Services	12-February-2021	CDM Monitoring	Rekha Menon
4	Dutta	Supratik	EKI Energy Services	12-February-2021	CDM Monitoring	Rekha Menon

2.4 Site Inspections

Please see 2.3

2.5 Resolution of Findings

CL from this verification

CL ID	01	Section no.	1.11	Date: 17/02/2021
Description of CL				
Section 1.11 of the MR is not clear, if the project has any provisions for monitoring and reporting the sustainable development indicators.				
Project participant response				Date: 28/07/2021
There is no provision of monitoring of sustainability development parameters neither according to the monitoring plan of the registered PD or host country regulation and through the above, the PP has considered that the project activity profoundly contributes to the sustainable development. The same has been provided in section 1.11 of MR				
Documentation provided by project participant				
VCS MR v02				

DOE assessment	Date: 18/08/2021
The project doesn't have any provisions for monitoring and reporting the sustainable development indicators as per the registered PD as well as host country regulations. The same has been made transparent in Section 1.11 of the MR. CL01 is closed.	

CL ID	02	Section no.	2.2	Date: 17/02/2021
Description of CL				
Section 2.2 of the local stakeholders' consultation is not transparent if the ongoing methods of stakeholder consultation is applicable to the proposed monitoring period. Also provide evidence to support the same.				
Project participant response				Date: 28/07/2021
The local stakeholder consultation procedure mentioned in section 2.2 is for the current monitoring period. Grievance register/list of complaints or feedbacks from local community provided to Verification Team				
Documentation provided by project participant				
1. MR v02 2. Grievance register				
DOE assessment				Date: 18/08/2021
It is checked that a grievance register is maintained at the site. The same has been checked and noted that the project has not received any negative comments. Ongoing methods of communication with local stakeholders has been made transparent in section 2.2 of the MR. CL 02 is closed.				

CL ID	03	Section no.	3.1	Date: 17/02/2021
Description of CL				
1. Plant shutdown maintenance schedule provided in the appendix is not applicable to the proposed monitoring period. Make the same transparent for the proposed period and provide evidence for the same. 2. Provide commissioning certificates of the 4 units.				
Project participant response				Date: 28/07/2021
1. Plant shutdown details for the current monitoring period have been provided in APPENDIX 2 of VCS MR 2. Commissioning certificates of four units provided				
Documentation provided by project participant				
1. VCS MRv02 2. Commissioning certificates				
DOE assessment				Date: 18/08/2021
1. Plant shutdown details have been mentioned in APPENDIX 2 of VCS MR and same is in line with plant records. 2. Checked the commissioning certificates. The same was checked with commissioning date mentioned in the MR and found to be consistent and acceptable. Based on the above CL 03 is closed.				

CL ID	04	Section no.	3.2.2	Date: 17/02/2021
Description of CL				
<p>It is also noted that, as per the registered PDD, the PP has confirmed to claim emission reductions only from 01/09/2015 onwards, i.e when the PP claims the ownership of the project, which was validated and approved by VCS. However, the proposed monitoring period is from 01/01/2014 to 31/08/2015, which is when the project was owned by Jai Prakash. It is further noted that for the same monitoring period CERs have been requested from the UNFCCC website. PP is requested to clarify the inconsistency and justify the ownership for claiming the emission reductions for the period 01/01/2014 to 31/08/2015.</p>				
Project participant response				Date: 28/07/2021
<p>The project activity hydro power plant was taken over by JSW Hydro Energy Limited from the previous owner; though the effective date of ownership transfer as per official documents is 01/09/2015, the ownership transfer implies complete transfer of assets and hence the carbon credits (VCUs) generated before that also is transferrable to JSW Hydro Energy Limited.</p>				
Documentation provided by project participant				
<p>Letter from Company Secretary confirming the ownership of the plant of JSW Hydro Energy Limited during the current monitoring period</p>				
DOE assessment				Date: 18/08/2021
<p>Verification team has checked ownership transfer documents of the project and also received Letter from Company Secretary which confirms that the legal ownership with JSW Hydro Energy Limited for the VCUs of the monitoring periods from 01/01/2014 to 31/08/2015. Further, since MR published in the CDM also for the same period but project proponent also confirms that net GHG emission reductions or removals generated during this monitoring period shall not be used for compliance under any other mechanisms. This was confirmed through a declaration submitted by the respective PP and hence accepted by the assessment team. Based on the above justification, CL04 is closed.</p>				

CL ID	05	Section no.	4.2	Date: 17/02/2021
Description of CL				
<p>1. Data and parameters monitored: EGfacility, y: PP is requested to clarify the source of data and measurement methods. The table is not transparent on the meter details like type, model, accuracy. Further PP is requested to provide the calibration dates of the meter and validity of the same and provide the calibration certificates to the VVB. As per the registered PDD, electricity export will be checked with JMR and cross checked with invoices. However, the same hasn't been provided to the verification team.</p> <p>2. Area of the reservoir: Justify the values used are appropriate for the proposed period and support the same with evidence.</p>				
Project participant response				Date: 28/07/2021
<p>1. Details of meter type, model, accuracy class, calibration dates etc. have been provided in section 4.2 of VCS MR</p> <p>2. Area of reservoir measured in the year 2014 has been provided in section 4.2 of VCS MR</p>				

Documentation provided by project participant	
VCS MR v02	
DOE assessment	Date: 18/08/2021
<ol style="list-style-type: none"> 1. Details of energy meters are now included in the revised MR V2. The verification team has been checked the mentioned details with calibration certificates and found consistent. 2. Area of reservoir measured in the year 2014 has been included in section 4.2 of VCS MR. The verification team has been checked with plant records and found consistent. <p>Based on the above justification, CL05 is closed.</p>	

CL ID	06	Section no.	4.3	Date: 17/02/2021
Description of CL				
<ol style="list-style-type: none"> 1. O&M structure: The O&M structure provided is for JSW hydro energy Ltd and the period for which emissions are claimed , the ownership lies with Jai Prakash. PP is requested to clarify the appropriateness of the O&M structure provided. 2. Line diagrams with monitoring points are not transparent. 				
Project participant response				Date: 28/07/2021
<ol style="list-style-type: none"> 1. O & M structure of the VCS project activity hydro power plant remains same despite the change in ownership and PP has provided an undertaking on it 2. Line diagram has been provided in section 4.3 of VCS MR 				
Documentation provided by project participant				
VCS MR v02				
DOE assessment				Date: 18/08/2021
<ol style="list-style-type: none"> 1. The verification team was checked the current O&M structure of the project activity and found no change in the structure despite the change in ownership. 2. Single line diagram is included in section 4.3 of the revised MR. <p>Based on the above justification, CL06 is closed.</p>				

CL ID	07	Section no.	5	Date: 17/02/2021
Description of CL				
Power density calculations not transparent in MR and ER spread sheets.				
Project participant response				Date: 28/07/2021
Power density calculation have been provided in section 5.2 of VCS MR				
Documentation provided by project participant				
Updated ER spread sheet V02				
DOE assessment				Date: 18/08/2021
Power density calculation has been incorporated in the updated ER sheet. The values applied in calculation are in line with plant records. Based on the above response, CL07 is closed.				

No Corrective Action Request (CAR) and Forward Action Request (FAR) was raised during this monitoring period.

2.5.1 Forward Action Requests

This 4th periodic verification of the project activity and no FAR was raised from validation or previous verification

2.6 Eligibility for Validation Activities

This section is not applicable for present verification.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Project has been also registered with UNFCCC under Clean Development Mechanism (CDM) and the UN reference number is 4993². The project proponent has provided undertaking that it will not claim any GHG credits under UNFCCC CDM during the current monitoring period.

3.2 Methodology Deviations

No methodology deviation is applied during the monitoring period.

3.3 Project Description Deviations

As per the registered VCS PD the PP is “Himachal Baspa Power Company Ltd.” The company name changed to “JSW Hydro Energy Limited” on 11-September-2018. The relevant document for change in company name issued by Registrar of Companies, Govt. of India have been checked and found correct. PP also informed that corresponding change in communication agreement to VCS has been provided. Thus, assessment team has accepted the project description deviation.

As deviation taken to change the name of the PP of the project activity during verification, thus VVB has confirmed the following

- The deviation has not negatively impacted the conservativeness of the quantification of GHG emission reductions or removals from the registered VCS PD.
- The deviation has not impacted the applicability of the methodology, additionality or the appropriateness of the baseline scenario from the registered VCS PD
- The deviation has not impacted the criteria and procedures for monitoring or measurement of methodology from the registered PDD

Further, no project description deviations applied in previous monitoring reports.

3.4 Grouped Project

This is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the verification site visit it was concluded that the project is implemented as per the instruction of the registered CDM PDD, Final CDM Validation report, VCS PD and Final Verification report for VCS GAP validation and verification. During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team.

The Project activity is a run-of-river hydropower project having aggregated installed capacity of 1000 MW that utilizes the natural flow of Satluj to generate electricity. The project location is Karcham and Wangtoo villages in Kinnaur district of Himachal Pradesh. There are four identical power units each having an installed capacity of 250 MW. The project activity includes 4 Francis turbines (with a rated capacity of 250 MW).

Securities Purchase Agreement dated November 2014 signed between previous and current owners, confirms the ownership of JSW Energy Limited, which includes the ownership of Verified Emission Reductions prior to transfer of ownership of the project also. This agreement has been verified by the VVB and confirms the ownership of the project.

² <https://cdm.unfccc.int/Projects/DB/RWTUV1310469729.49/view>

To verify the implementation of project activity, technical specifications of Turbine/Generator, onsite operation & maintenance, monitoring & management practices; assessment team has conducted Skype video call/telephonic interviews with onsite in-charge, O&M team and also had a detail discussion with the PP representative and reviewed third party statutory documents i.e. Technical specifications by manufacturer, Commissioning certificates, Complete set of JMRs covering monitoring period, breakdown log, O&M schedule, grievance register and other relevant records. Same are also cross-checked with photographs/videos submitted by PP for current monitoring period and previous CDM & VCS verifications and were found to be consistent with the description given in the registered CDM PDD & VCS PD.

After telephonic/Skype interviews with concerned onsite persons, document reviews & site videos/photographs submitted by PP; assessment team concluded that the project activity is still implemented and operated in-line with the registered VCS PD & CDM PDD. There is no change in the project design or operation and monitoring practices at site which can alter the applicability or additionality of the project activity. In addition to the interviews with PP, assessment team have checked the commissioning certificate and JMRs and found that the project activity is implemented as per the VCS PD and Monitoring report submitted by the PP for current monitoring period. Assessment team therefore of the opinion that project is implemented as described in the registered PD and there is no change in monitoring practices as well as all monitoring parameters as envisaged in the VCS PD & MR. All the monitored values are supported by the evidences i.e. JMRs and found that information provided in the MR is inline with the submitted evidences.

Also, it has been assessed and confirmed by the audit team the project has neither been participated nor rejected under any other GHG programs. The project activity has not created any form of environmental credits for the monitoring periods other than VCS credits. Further, the GHG emission reductions or removals generated by the project has not included in an emissions trading program or any other mechanism that includes GHG allowance trading, and the project's sustainable development contributions. PP has also submitted undertaking letter to audit team to confirm the same.

The audit team has checked all the commissioning certificates of WTGs to confirm the location and the implementation of the project.

Means of verification	Referring to VCS v4 and p.360, p.361, p.363 and p.364 of CDM VVS PA, v2.0, the below tables provide a summary on the verification of each monitoring parameter listed in the registered monitoring plan.	
	Data / Parameter:	EG _{facility, y}
	Data unit:	MWh
	Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y

	Source of data used:	Monthly Joint Meter Reading (JMR)
	Means of verification/Comments:	This net electricity generation values are cross checked with JMR
	Cross-check	Cross checked with the parameter of TEG _y . The annual value for TEG _y (7,940,930.92 MWh) is higher than the EG _{facility,y} (7,887,873.10 MWh)

Data / Parameter:	TEG _y
Data unit:	MWh
Description:	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y.
Source of data used:	Daily progress report
Means of verification/Comments:	This net electricity generation values are cross checked with daily progress report
Cross-check	Cross checked with the parameter net electricity value of the project activity

Data / Parameter:	Cap _{PJ}
Data unit:	W
Description:	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data used:	Commissioning Certificate.
Means of verification/Comments:	Installed capacity of the hydro power plant after the implementation of the project activity have not been changed or not
Cross-check	Not Applicable as installed capacity has not been changed

Data / Parameter:	A _{PJ}
Data unit:	m ²
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data used:	Measured by actual surveys conducted at project site
Means of verification/Comments:	To confirm reservoir capacity with actual monitoring survey
Cross-check	Not applicable

Compliance with the calibration frequency requirements for measuring instruments

As per the registered monitoring plan, the meters are to be calibrated annually. The audit team has checked the calibration certificates and records of the monitoring equipment as given below and found that there is delay in calibration for December 2014 and January 2015. Accordingly PP has applied necessary

	<p>correction factors for the delay, and the calculations are found to be conservative. The details of the calibration of meters is given in the table below.</p>
Conclusion	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD. All parameters were monitored and determined as per the registered monitoring plan. Referring to p.360, p.361, p.363 and p.364 of CDM VVS PA, v2.0, VVB confirms through video call and telephonic interviews and from the document review, the actual monitoring system complies with the registered monitoring plan. The substantiation of this conformity on information flow for these parameters including the values in the monitoring reports is reported in the above section.</p> <p>During the verification, all relevant monitoring parameters of the registered monitoring plan have been verified with regard to the appropriateness of the verification method, the correctness of the values applied for ER calculation, the accuracy and applied QA/QC measures. After appropriate corrections, carried out by the project participant, it is confirmed that all monitoring parameters have been measured / determined without material misstatements and are in line with all applicable standards and relevant requirements.</p> <p>All parameters required to be monitored are recorded at the intervals required by the registered monitoring plan and the applied methodology. On the basis of review of source and nature of available evidences and records, the verification team confirms the quality of evidence for emission reduction provided is sufficient as per CDM VVS PA, v2.0.</p>

Calibration of the meters

Sr No	Location	Type	Serial Number	Make	Accur acy Class	Previous calibration date	Current Calibration date	Validity of calibration
1	Feeder-1	Main	NP8526A	M/s L & T	0.2s	21/12/2012	08/01/2015	07/01/2017
2	Feeder-2	Main	NP8530A	M/s L & T	0.2s	21/12/2012	08/01/2015	07/01/2017
3	Feeder-3	Main	NP8528A	M/s L & T	0.2s	13/12/2012	08/01/2015	07/01/2017
4	Feeder-4	Main	NP8529A	M/s L & T	0.2s	13/12/2012	08/01/2015	07/01/2017
5	Feeder-5	Main	NP8527A	M/s L & T	0.2s	21//12/2012	08/01/2015	07/01/2017
6	Feeder-6	Main	NP8546A	M/s L & T	0.2s	21//12/2012	08/01/2015	07/01/2017

7	Feeder-1	Check	NP8400A	M/s L & T	0.2s	21//12/2012	07/01/2015	06/01/2017
8	Feeder-2	Check	NP8401A	M/s L & T	0.2s	21//12/2012	07/01/2015	06/01/2017
9	Feeder-3	Check	NP8402A	M/s L & T	0.2s	21//12/2012	07/01/2015	06/01/2017
10	Feeder-4	Check	NP8403A	M/s L & T	0.2s	21//12/2012	07/01/2015	06/01/2017
11	Feeder-5	Check	NP8548A	M/s L & T	0.2s	21//12/2012	07/01/2015	06/01/2017
12	Feeder-6	Check	NP8547A	M/s L & T	0.2s	21//12/2012	07/01/2015	06/01/2017

4.2 Safeguards

4.2.1 No Net Harm

The project do not have any negative environmental and social impacts.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration. As confirmed by PP during interviews, for on-going stakeholders' communication, PP has maintained feedback/complaint register at the site office. Local stakeholders can anytime lodge their grievances if any in the register over the operational life time of the project.

During current monitoring period no grievance was received. Thus, assessment team is of the opinion that the ongoing stakeholder mechanism is adequate and appropriate."

4.3 AFOLU-Specific Safeguards

This section is not applicable as this project activity is a non-AFOLU project activity.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The assessment of data and the calculation of baseline emission reduction in the MR and the ER excel sheet have been verified as per the following set of supporting documents: <ol style="list-style-type: none"> 1. Energy bills 2. Joint meter readings 3. VER spreadsheets 4. Sales Invoices
Conclusion	Calculations applied formulae and method for calculation of baseline emission are in accordance with the registered monitoring plan and are in line with the requirements of the applied methodology.

Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the project activity. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan
Conclusion	Project emissions are zero as per the requirement of the methodology and registered CDM PDD and VCS PD.

Calculation of leakage GHG emissions

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the project activity. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan
Conclusion	Leakage emissions are not applicable according to the applied methodology and registered CDM PDD

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	<p>No lack of evidence and missing data were detected during this monitoring period. All values as per the monitoring plan were crosschecked by the verification team against basic monitored data and the calculations were found to be correct. The verification team confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors, application of maximum permissible errors and default values are explicitly mentioned in the monitoring report. Hence the VVB confirms that the methods and formulae used to obtain the emissions are appropriate.</p> <p>No reporting risks have been identified for the data reported. Troubleshooting procedure, maintenance and calibration of monitoring equipment, monitoring measurements and reporting, record handling and maintenance, reviewing monitored data are available at the plant. All the monitored data are archived partially in electronic and paper form. The data will be kept for the whole crediting period and 2 years after the last crediting period thereby meeting the requirement of the monitoring plan.</p>
Conclusion	<p>The formulae and the methods referred in the MR and the emission reduction calculation spread sheet comply with the methods described in the registered PDD.</p> <p>No lack of evidence and missing data were detected during this monitoring period. All values as per the monitoring plan were crosschecked by the verification team against basic monitored data and the GHG emission calculation is found correct.</p> <p>TUV SUD confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors and default values are explicitly mentioned in the monitoring report. Calculations applied formulae and method for calculation of GHG emission are in accordance with the registered monitoring plan and are in line with the requirements of VCS, the applied methodology and p. 372, p.373 of CDM VVS PA ver 2.0.</p>

4.6 Non-Permanence Risk Analysis

Not applicable

5 VERIFICATION CONCLUSION

The VVB confirms that

- the development and maintenance of records and reporting procedures are in accordance with the registered monitoring plan;
- the project is operated as planned and described in the project design document approved by the VCS;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the monitoring plan in Monitoring Report is as per the VCS PD and monitoring plan approved by the VCS;
- the approved monitoring plan in the approved VCS DD is as per the applied methodology;
- There is an audit trail that contains the evidence and records that validate the stated figures.

Based on the information we have seen and evaluated, we confirm that the project activity achieved the verified amount of reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the project activity

Verification period: From 01 January 2014 to 31 August 2015

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2014	34,038,83	0	0	34,038,83
2015	2,930,867	0	0	2,930,867
Total	6,334,750	0	0	6,334,750

APPENDIX 1: <DOCUMENTS REVIEWED>

No.	Author	Title	References to the document
1.	UNFCCC	CDM VVS for PA v2.0	-
2.	UNFCCC	ACM0002 – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Version 12.1.0	-
3.	Verra	VCS Standard v4.0	-
4.	UNFCCC	Registered CDM PDD	Version 04 28/03/2012
5.	UNFCCC	Final CDM Validation report	Version 02 12/04/2012
6.	VCS	Final VCS PD	Version 02 17/04/2018
7.	NA	Draft Monitoring report (4 th VCS Verification)	Version 01 29-January-2021
8.	NA	Final Monitoring report (4 th VCS Verification)	Version 02 26-July-2021
9.	NA	Emission Calculation sheet version 01	Version 01 29-January-2021
10.	NA	Revised Emission Calculation sheet version 02	Version 02 26-July-2021
11.	NA	The operational lifetime of the project activity from the manufacturer=(Technical specifications)	Manufacturer technical specifications
12.	NA	Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.int CEA: Central electricity authority www.cea.nic.in VCS: Verified Carbon Standard www.v-c-s.org	Reference link is provided.
13.	NA	Tools/ guidelines used in the project activity <ul style="list-style-type: none"> • Tool to determine the remaining lifetime of the project activity in line with Annex 15 EB 50 • Tool to calculate the emission factor for an electricity system • Glossary of CDM terms version 07 • VCS verification report template version 4.0 	UNFCCC CDM web site
14.	NA	JMR records for the complete monitoring period	JMR records
15.	NA	Invoices for the complete monitoring period	Invoice

16.	NA	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for the same period and double counting	-
17.	NA	Name Change certificate from Registrar of Companies (ROC), Ministry of Corporate Affairs, Government of Maharashtra	September-2018
18.	NA	Break down details of the complete monitoring period	Log sheet
19.	NA	Skype and telephonic interviews carried out with PP as part of remote audit due COVID-19 situation in India	NA
20.	NA	Calibration certificate of all energy meters	2013-14
21.	NA	Plant Shutdown data	2013-14
22.	NA	Survey report to measure the reservoir	-
23.	NA	Site photographs	-
24.	NA	GPS Coordinates	-
25.	NA	Single line diagram for metering arrangements	-
26	JSW Energy	Security Purchase Agreement for Ownership of the project.	November 2014