

Verification Report for Carbon Offset Units (CoUs) for Project (UCR ID Number: 113)

Title: “1500 MW Large Scale Nathpa Jhakri Hydroelectric Station by SJVN Limited (HCPL CREDUCE JV)”



Project Owner details:

SJVN Limited,

Shakti Sadan, Shanan, Shimla-171006, Himachal Pradesh, India.

Submitted by:

Arjun K Vyas

Approved Verifier, UCR


Contact No.: +91 8320809503

Email: arjun@thenaturelink.in

COVER PAGE**Project Verification Report Form (VR)****BASIC INFORMATION**

Name of approved UCR Project Verifier / Reference No.	Mr. Arjun K Vyas (Independent Verifier)
Type of Accreditation	<input type="checkbox"/> CDM Accreditation <input type="checkbox"/> ISO 14065 Accreditation <input checked="" type="checkbox"/> UCR Approved Verifier
Approved UCR Scopes and GHG Sectoral scopes for Project Verification	Sectoral Scope: 01 Energy Industries
Validity of UCR approval of Verifier	06/04/2022 onwards
Completion date of this VR	06/04/2022
Title of the project activity	1500 MW Large Scale Nathpa Jhakri Hydroelectric Station by SJVN Limited (HCPL CREDUCE JV)
Project reference no. (as provided by UCR Program)	113
Name of Entity requesting verification service (can be Project Owners themselves or any Entity having authorization of Project Owners, example aggregator.)	SJVN Limited HCPL CREDUCE JV
Contact details of the representative of the Entity, requesting verification service (Focal Point assigned for all communications)	Creduce Technologies Private Limited- Address: 2-O-13,14 Housing Board Colony, Banswara, Rajasthan - 327001, India.
Country where project is located	India
Applied methodologies (Approved methodologies by UCR Standard used)	ACM0002: "Grid-connected electricity generation from renewable sources", version 20
Project Verification Criteria: Mandatory requirements to be assessed	<input checked="" type="checkbox"/> UCR Standard <input checked="" type="checkbox"/> Applicable Approved Methodology <input type="checkbox"/> Applicable Legal requirements /rules of host country

	<input checked="" type="checkbox"/> Eligibility of the Project Type <input checked="" type="checkbox"/> Start date of the Project activity <input checked="" type="checkbox"/> Meet applicability conditions in the applied methodology <input checked="" type="checkbox"/> Credible Baseline <input checked="" type="checkbox"/> Do No Harm Test <input checked="" type="checkbox"/> Emission Reduction calculations <input checked="" type="checkbox"/> Monitoring Report <input checked="" type="checkbox"/> No GHG Double Counting <input type="checkbox"/> Others (please mention below)
Project Verification Criteria: Optional requirements to be assessed	<input checked="" type="checkbox"/> Environmental Safeguards Standard and do-no-harm criteria <input type="checkbox"/> Social Safeguards Standard do-no-harm criteria
Project Verifier's Confirmation: The <i>UCR Project Verifier</i> has verified the UCR project activity and therefore confirms the following:	The UCR Project Verifier Arjun K Vyas, certifies the following with respect to the UCR Project Activity "1500 MW Large Scale Nathpa Jhakri Hydroelectric Station by SJVN Limited (HCPL CREDUCE JV)" <input checked="" type="checkbox"/> The Project Owner has correctly described the Project Activity in the Project Concept Note (dated 07/03/2022) including the applicability of the approved methodology ACM0002 version 20 and meets the methodology applicability conditions and has achieved the estimated GHG emission reductions, complies with the monitoring methodology and has calculated emission reductions

	<p>estimates correctly and conservatively.</p> <p><input checked="" type="checkbox"/> The Project Activity is likely to generate GHG emission reductions amounting to 5,03,13,069 TCO_{2e}, as verified by this report, which are additional to the reductions that are likely to occur in absence of the Project Activity and complies with all applicable UCR rules, including ISO 14064-2 and ISO 14064-3.</p> <p><input checked="" type="checkbox"/> The Project Activity is not likely to cause any net-harm to the environment and/or society</p> <p><input checked="" type="checkbox"/> The Project Activity complies with all the applicable UCR rules and therefore recommends UCR Program to register the Project activity with above mentioned labels.</p>
<p>Project Verification Report, reference number and date of approval</p>	<p>Verification Report UCR Project ID: 113 Date: 06/04/2022</p>
<p>Name of the authorised personnel of UCR Project Verifier and his/her signature with date</p>	<p>Arjun K Vyas</p> 

Project Verification Report

A. Executive Summary

The verification work has been contracted by project aggregator Creduce Technologies Pvt Ltd to perform an independent verification of its UCR project titled “**1500 MW Large Scale Nathpa Jhakri Hydroelectric Station by SJVN Limited (HCPL CREDUCE JV)**” UCR approved Project ID:113, to establish number of CoUs generated by project over the crediting period from 01/01/2014 to 31/12/2021 (both days included).

Verification for the period : 01/01/2014 to 31/12/2021

In my opinion, the total GHG emission reductions over the crediting / verification period stated in the Monitoring Report (MR), submitted to me is found to be correct and in line with the UCR guidelines.

The GHG emission reductions were calculated on the basis of UCR Protocols which draws reference from, Standard Baseline, ACM002: “Grid-connected electricity generation from renewable sources”, version 20. Owing to the Covid pandemic, the verification was done remotely by way of video calls, phone calls and submission of documents for verification through emails.

I am able to certify that the emission reductions from the 1500 MW Large Scale Nathpa Jhakri Hydroelectric Station by SJVN Limited (HCPL CREDUCE JV) (UCR ID – 113) for the period 01/01/2014 to 31/12/2021 amounts to 5,03,13,069 CoUs (5,03,13,069 tCO₂eq).

Scope

The scope of the verification is the independent, objective review and ex post determination of the monitored reductions in GHG emission by the project activity as mentioned below:

1. The quality of data management and records of underlying data;
2. Completeness and accuracy of calculations and baseline emission reports;
3. Proper inclusion and documentation of all project locations,
4. Correct application of offset rules for filling Baseline Period data gaps;
5. Other data, methods and procedures deemed necessary to establish the accuracy of emission reductions.
6. Agreement stating Assurance to avoid double accounting for the project to be verified, along with required proof.

The project is assessed against the requirements of the UCR programme verification Guidance Document, UCR Standard, UCR Programme Manual and related rules and guidelines. Due professional care has been exercised and ethical conduct has been followed by the assessment team during the verification process. The verification report is a fair presentation of the verification activity. The validation of project is not part of present assignment and projects deemed validated post registration by UCR.

Description of the Project

As described in the Project Concept Note (PCN), the project activity involves 6 Vertical Axis Francis Turbines having individual capacity of 250 MW each. The project Power house is located at village Jhakri while the Reservoir is located in the village Nathpa. The project is also called Nathpa Jhakri Hydro Power Station as mentioned in the Power Purchase Agreement submitted for verification.

As mentioned in the Monitoring Report and Emission Reduction Calculation sheet submitted for the verification, the project replaces anthropogenic emissions of greenhouse gases (GHGs) estimated to be approximately 5,03,13,069 tCO₂e for the said period under verification, there on displacing 5,59,03,409 MWh amount of electricity from the generation mix of power plants connected to the Indian electricity grid, which is mainly dominated by the fossil-fuel based power plant.

The project activity is a grid connected renewable energy generation project having capacity of more than 15 MW. The project is a Large-Scale activity. The methodology applied in the Monitoring Report is verified against the ACM0002: "Grid-connected electricity generation from renewable sources", version 20.

Verified total emission reductions achieved through the project activity during the monitoring period is summarised below:

Summary of the Project Activity and ERs Generated for the Monitoring Period

Start date of this Monitoring Period	01/01/2014
Carbon credits claimed up to	31/12/2021
Total ERs generated (tCO ₂ eq)	5,03,13,069 tCO ₂ eq
Leakage	0

B. Project Verification team, technical reviewer and approver:

No.	Role	Last name	First name	Affiliation	Involvement in		
					Doc review	Off-Site inspection	Interviews
1.	Team Leader	Vyas	Arjun	Independent Verifier	Yes	No	Yes
2.	Validator	Vyas	Arjun	Independent Verifier	Yes	No	Yes
3.	Technical Expert	Shah	Kalindi	Outsourced Entity	Yes	No	No

C. Means of Project Verification

Desk/document review

The project documents submitted to UCR approved verifier Mr. Arjun K Vyas was reviewed by the technical expert and validated by the verifier at Gandhinagar. The documents reviewed involves verification of legal status of individual project owner for consistency, project related documents like installation and commissioning of equipment used in project activity. Environmental clearances from state or central pollution control board Consent to establish and operate, monitoring related meters/parameters equipment measuring instruments and their calibration records, to establish running of equipment for the crediting period etc.

The PCN is made available to verifier post approval by UCR which is considered as validated documents and the content of validated PCN are considered as record wherever required. Further the communication agreement made between project owner and project aggregator is document of UCR registry hence the project aggregator is treated as authorized representative of project owner. All the documents submitted by project aggregator to verifier is treated as documents submission on behalf of project owner.

The list of submitted document is available in subsequent section of this verification report under section "Document reviewed or referenced"-section I.

On-Site inspection- Not applicable.

Date of off-site inspection: DD/MM/YYYY to DD/MM/YYYY	Not applicable as per UCR guideline site visit not conducted for this verification activity.		
No.	Activity performed Off-Site	Site location	Date
1.			

Interviews: Uncertainty checks in the Electricity Generation of the Project

No.	Interview			Date	Subject
	Last name	First name	Affiliation		
1.	Chaudhary	Pankaj	Sr. AGM, Corporate Planning	06/04/2022	Error/ Uncertainty check in the Electricity Generation of the Project

Sampling approach:

Not Applicable.

Clarification request (CLs), corrective action request (CARs) and forward action request (FARs) raised



Areas of Project Verification findings	No. of CL	No. of CAR	No. of FAR
Green House Gas (GHG)			
Identification and Eligibility of project type	NIL	NIL	NIL
General description of project activity	NIL	NIL	NIL
Application and selection of methodologies and standardized baselines	--	--	--
- Application of methodologies and standardized baselines	NIL	01	NIL
- Deviation from methodology and/or methodological tool	NIL	NIL	NIL
- Clarification on applicability of methodology, tool and/or standardized baseline	NIL	NIL	NIL
- Project boundary, sources and GHGs	NIL	NIL	NIL
- Baseline scenario	NIL	NIL	NIL
- Estimation of emission reductions or net anthropogenic removals	NIL	NIL	NIL
- Monitoring Report	NIL	NIL	NIL
Start date, crediting period and duration	NIL	NIL	NIL
Environmental impacts	NIL	NIL	NIL
Project Owner- Identification and communication	NIL	NIL	NIL
Others (please specify)	NIL	NIL	01
Total	NIL	01	01

D. Project Verification findings



Identification and eligibility of project type

Means of Project Verification	<p>The project activity is a registered UCR project (UCR Project ID - 113). https://www.ucarbonregistry.io/Registry/Details?id=3E453wwpH0yW%2BMhwJWub1Q%3D%3D</p> <p>The installed capacity of the Hydro Turbines is 250 MW x 6 = 1500 MW. The project is a Large Scale. The project has taken reference of CDM methodology ACM0002: "Grid-connected electricity generation from renewable sources", version 20 for the estimation of the GHG emission reduction.</p> <p>The project was commissioned after 01/01/2002 as can be verified at website of SJVN Limited accessed on 05-04-2022. https://sjvn.nic.in/businessprojectdetails/28/5/7. Also, the same dates are verified through independent documents like Power Purchase Agreements, Deviation Settlement Accounts of Ministry of Power.</p> <table border="1" data-bbox="544 891 1082 1133"><thead><tr><th>Turbine</th><th>Commissioning Date</th></tr></thead><tbody><tr><td>UNIT-1</td><td>May 18, 2004</td></tr><tr><td>UNIT-2</td><td>May 06, 2004</td></tr><tr><td>UNIT-3</td><td>March 31, 2004</td></tr><tr><td>UNIT-4</td><td>March 30, 2004</td></tr><tr><td>UNIT-5</td><td>October 06, 2003</td></tr><tr><td>UNIT-6</td><td>January 02, 2004</td></tr></tbody></table>	Turbine	Commissioning Date	UNIT-1	May 18, 2004	UNIT-2	May 06, 2004	UNIT-3	March 31, 2004	UNIT-4	March 30, 2004	UNIT-5	October 06, 2003	UNIT-6	January 02, 2004
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Findings	<ol style="list-style-type: none">1. Project activity is described through UCR approved PCN.2. UCR project communication agreement clearly defines the Project Proponent and Project Aggregator.														
Conclusion	<p>The UCR approved format is used for description and project meets the requirement of UCR verification standard and UCR project standard.</p> <p>UCR project communication agreement submitted to verifier and the same has been verified. Methodology referenced and applied appropriately describing the project type. The eligibility of project aggregator is verified using UCR communication agreement, Project correctly applies the verification standard, UCR project standard and UCR regulations.</p> <p>The project activity is overall meeting the requirements of UCR Verification standard and UCR project standard.</p>														

General description of project activity

Means of Project Verification	<p>The project activity involves the setting up of a run-of-river hydro power plant that was commissioned for operation by the year 2004 as per the information available on SJVN official website and Power Purchase Agreement stands verified. The project generates electricity from the 6 hydro turbine generators and supplies to the NEWNE grid. The sale of power to various states and other entities have been verified through the power purchase agreements.</p>	
	<p>The location of the Reservoir (31°33'51.8"N 77°58'48.1"E) and Power House (31°29'58.5"N, 77°42'22.2"E) as mentioned in the Monitoring Report are verified by the Google Maps (https://www.google.com/maps).</p>	
	<p>The power evacuation is done at NJHPS substation with the below meters maintained by PGCIL, India.</p>	
NP-3012-A	Line side Karcham Wangtoo-I (NJHPS-Jhakri)	
NP-3074-A	Line Side Karcham Wangtoo-II (NJHPS-Jhakri)	

	<p>NP-1893-A</p>	<p>Line Side Panchkulla-I (NJHPS-Jhakri)</p>	
<p>NP-1894-A</p>	<p>Line Side Gumma-II (NJHPS-Jhakri)</p>		
<p>NP-3013-A</p>	<p>Line Side Rampur-I (NJHPS-Jhakri)</p>		
<p>NP-1360-A</p>	<p>Line Side Rampur-II (NJHPS-Jhakri)</p>		

	NP-8514-A	25MVA Station Transformer, Main Meter (NJHPS-Jhakri)	
	NP-8845-A	25MVA Station Transformer, Check Meter (NJHPS-Jhakri)	
Findings	No findings were raised.		
Conclusion	The description of the project activity is verified to be true based on the review of PCN, MR, Power Purchase Agreement, Technical Specification sheet, and Single Line diagrams.		

Application and selection of methodologies and standardized baselines

(.a.i) Application of methodology and standardized baselines

Means of Project Verification	<p>Project has taken reference of CDM methodology ACM0002 CDM website is referred to check the latest version of the methodology.</p> <p>https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGW8ED5PG</p> <p>The latest published Central Electricity Authority Database¹⁷ have been used to verify the Grid Emission factor EF_{grid,y} from the below link:</p> <p>https://cea.nic.in/cdm-co2-baseline-database/?lang=en</p> <p>The project activity results in new single reservoir. The parameters indicated in the monitoring report are correctly used to calculate equation (7) of the methodology ACM0002 version 20. The power density is found to be 6,290 W/m² which is greater than 4 W/m².</p> <p>For the applicability mentioned in the PCN and MR, Turbine Specification, and Project Report were referred.</p>
Findings	CAR 01 has been raised and resolved in the PCN Version 2.0.
Conclusion	Methodology application is appropriate meeting the requirements of UCR and its standardized baseline. The methodology version is correct and valid. Referenced methodology is applicable to project activity.

(.a.ii) Clarification on applicability of methodology, tool and/or standardized baseline

Means of Project Verification	The documents reviewed are ACM0002: "Grid-connected electricity generation from renewable sources", version 20, UCR Program standard, and UCR Verification Standard.																																			
Findings	<p>Emission factor calculated using the methodology are as per the below table:</p> <table border="1" data-bbox="491 1503 1390 1731"> <thead> <tr> <th>Emission Factors (tCO₂/MWh) (incl. Imports)</th> <th>2015-16</th> <th>2016-17</th> <th>2017-18</th> <th>2018-19</th> <th>2019-20</th> <th>2020-21</th> </tr> </thead> <tbody> <tr> <td>Weighted Average Emission Rate (2)</td> <td>0.82</td> <td>0.82</td> <td>0.82</td> <td>0.82</td> <td>0.79</td> <td>0.79</td> </tr> <tr> <td>Simple Operating Margin (1) (2)</td> <td>0.97</td> <td>0.96</td> <td>0.95</td> <td>0.96</td> <td>0.96</td> <td>0.94</td> </tr> <tr> <td>Build Margin (not adjusted for imports)</td> <td>0.91</td> <td>0.87</td> <td>0.87</td> <td>0.88</td> <td>0.87</td> <td>0.87</td> </tr> <tr> <td>Combined Margin (1) (2)</td> <td>0.94</td> <td>0.92</td> <td>0.91</td> <td>0.92</td> <td>0.91</td> <td>0.90</td> </tr> </tbody> </table> <p>UCR Standard version 3.0 update on Jan 2022 recommends an emission factor of 0.9 tCO₂/MWh for the 2014- 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program.</p>	Emission Factors (tCO ₂ /MWh) (incl. Imports)	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Weighted Average Emission Rate (2)	0.82	0.82	0.82	0.82	0.79	0.79	Simple Operating Margin (1) (2)	0.97	0.96	0.95	0.96	0.96	0.94	Build Margin (not adjusted for imports)	0.91	0.87	0.87	0.88	0.87	0.87	Combined Margin (1) (2)	0.94	0.92	0.91	0.92	0.91	0.90
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Combined Margin (1) (2)	0.94	0.92	0.91	0.92	0.91	0.90																														

	For the year 2021-22, the Project Proponent has taken same emission factor as recommended by UCR for the years 2014-2020, which is fairly conservative approach.
Conclusion	Methodology has not been applied “as it is” rather it is referenced. The emission factor considered for the calculation of the emission reductions is verified with the UCR Program Standard. The total installed electrical energy generation capacity of the project equipment exceeds 15 MW thus meeting the requirement of large-scale project.

(.a.iii) Project boundary, sources and GHGs

Means of Project Verification	PCN, MR, UCR Program Additional Verification Guidance for Large Hydel Projects (> 15MW installed capacity).
Findings	Project boundary is appropriately defined in PCN version 02 which is physical and geographical site of power house. No major source of GHG emission were found considering the additional verification criteria of UCR for Large Hydel Projects.
Conclusion	Project boundary is correctly defined in PCN version 02. GHG source correctly identified and reported. The project meets the requirements of UCR project standard, Verification standard and methodology requirements for boundary, GHG source.

(.a.iv) Baseline scenario

Means of Project Verification	PCN Section B.5 and General Project Eligibility Criteria and Guidance, UCR Standard.
Findings	Declared information is correct and verified.
Conclusion	Baseline scenario is appropriately described. The conservative or default value for emission considered. The baseline scenario is in accordance with UCR project verification standard and UCR project standard.

(.a.v) Estimation of emission reductions or net anthropogenic removal

Means of Project Verification	<p>Meter Calibration reports, Detailed Generation Reports, and General Project Eligibility Criteria and Guidance, UCR Standard, page 4.</p> <p>Baseline emissions are to be calculated as follows:</p> $BE_y = EG_y \times EF_{grid,y}$ <p>Where:</p> <p>BE_y = Baseline emissions in year y (t CO₂)</p> <p>EG_y = Quantity of net electricity generation (adjusted measured values) that is produced and fed into the grid as a result of the implementation of this project activity in year y (MWh).</p> <p>$EF_{grid,y}$ = UCR recommended emission factor of 0.9 tCO₂/MWh has been considered, this is conservative as compared to the combined</p>
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	<p>margin grid emission factor which can be derived from Database of Central Electricity Authority (CEA), India.</p> <p>Hence,</p> $BEy = 5,59,03,409 \times 0.9 = 5,03,13,069 \text{ tCO}_2\text{eq}$ <p>Project Emissions</p> <p>Considering ACM0002 methodology paragraph 38 (c) equation 10. The project power density is higher than 10 W/m² and hence PEy =0.</p> <p>Leakage Emissions</p> <p>As per paragraph 53 of ACM0002 version-20, all projects other than Biomass projects have zero leakage.</p> <p>Total Emission reduction by the project for the current monitoring period is calculated as below:</p> <p>Hence,</p> $ERy = 5,03,13,069 - 0 - 0$ $ERy = 5,03,13,069 \text{ CoUs}$
Findings	FAR 01 has been raised due to unavailability of the Calibration Reports during the period of 01/01/2014 to 31/12/2021.
Conclusion	The Emission reductions are now correctly calculated and mentioned in the Monitoring Report version 2.0. The instruments were calibrated on date 31/03/2022 and hence the emission reduction is reported correctly and meets the requirements of UCR verification standard and UCR project standard.

(.a.vi) Monitoring Report

Means of Project Verification	Meter Calibration reports, Detailed Generation Reports, Deviation Settlement Accounts and General Project Eligibility Criteria and Guidance, UCR Standard, page 4.
Findings	FAR 01 has been raised due to unavailability of the Calibration Reports during the period of 01/01/2014 to 31/12/2021.
Conclusion	Monitoring parameter as reported through MR adequately represents the parameters relevant to emission reduction calculation. Due to the unavailability of the calibration report during the crediting period, an error of -0.27% is being applied to the EGy for the entire crediting period 01/01/2014 to 31/12/2021. Hence it can be concluded that the approach followed by the PP is conservative and in line with the guidelines. The number of CoUs generation is calculated based on the conservatively calculated EGy parameter. The calculation was done using excel sheet where all the parameters were indicated. The emission factor for electricity is as per UCR standard. The monitoring parameters and emission reduction calculations are correctly

	calculated and reported. The monitoring report meets the requirements of UCR project verification requirements.
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Start date, crediting period and duration

Means of Project Verification	<p>PCN and MR, Power Purchase Agreement, technical Specification sheet, Detailed Generation Report were referred.</p> <p>The project was commissioned after 01/01/2002 as can be verified at website of SJVN Limited accessed on 05-04-2022. https://sjvn.nic.in/businessprojectdetails/28/5/7. Also, the same dates are verified through independent documents like Power Purchase Agreements, Deviation Settlement Accounts of Ministry of Power.</p> <table border="1"> <thead> <tr> <th>Turbine</th> <th>Commissioning Date</th> </tr> </thead> <tbody> <tr> <td>UNIT-1</td> <td>May 18, 2004</td> </tr> <tr> <td>UNIT-2</td> <td>May 06, 2004</td> </tr> <tr> <td>UNIT-3</td> <td>March 31, 2004</td> </tr> <tr> <td>UNIT-4</td> <td>March 30, 2004</td> </tr> <tr> <td>UNIT-5</td> <td>October 06, 2003</td> </tr> <tr> <td>UNIT-6</td> <td>January 02, 2004</td> </tr> </tbody> </table> <p>As per the UCR Standard Version 3.0, "The earliest verification period accepted is January 01, 2014. CoUs can be claimed for January 01,2014 onwards."</p>	Turbine	Commissioning Date	UNIT-1	May 18, 2004	UNIT-2	May 06, 2004	UNIT-3	March 31, 2004	UNIT-4	March 30, 2004	UNIT-5	October 06, 2003	UNIT-6	January 02, 2004
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Findings	Declared information is correct and verified.														
Conclusion	The start date, crediting period and project duration reported correctly and this meets the requirements of UCR verification standard and UCR project standard.														

Project Owner- Identification and communication

Means of Project Verification	<p>PCN, Communication Agreement, MR, Power Purchase Agreement.</p> <p>The project activity is a registered UCR project (UCR Project ID - 113). https://www.ucarbonregistry.io/Registry/Details?id=3E453wwpH0yW%2BMhwJWub1Q%3D%3D</p> <p>The project is validated by the UCR. UCR has authorised CREDUCE Technologies Pvt. Ltd. to act as Project Aggregator on behalf of SJVN Limited (Project Owner). Communication Agreement is submitted for the verification of the same.</p>
Findings	Declared information is correct and verified.
Conclusion	Project owner identified through communication agreement signed between PP and PA. Also, legal document like Power Purchase Agreement clearly establishes the project owner. The identification and communication correctly meet the requirement of project verification and UCR project standard.

E. Internal quality control:

- Due professional care has been taken while reviewing the submitted document.
- There is no conflict of interest as the verifier has no other engagement with either aggregator or project owner directly or indirectly.
- Verification team consists of experience personnel.
- Technical review is performed by experienced and independent person.

F. Project Verification opinion:

Considering the above mentioned verification conducted on the basis of UCR Protocol, which draws reference from UCR Protocol Standard Baseline, ACM0002 – Grid-connected electricity generation from renewable sources (Version 20.0), the documents submitted during the verification including the data, Project Concept Note (PCN) / Monitoring Report (MR), I am able to certify that the emission reductions from the project - 1500 MW Large Scale Nathpa Jhakri Hydroelectric Station by SJVN Limited (HCPL CREDUCE JV) (UCR ID – 113) for the period 01/01/2014 to 31/12/2021 amounts to 5,03,13,069 CoUs (5,03,13,069 tCO₂eq).

G. Abbreviations

Abbreviations	Full texts
UCR	Universal Carbon Registry
CPCB	Central Pollution Control Board
PGCIL	Power Grid Corporation of India Limited
HPSEBL	Himachal Pradesh State Electricity Board Limited
MR	Monitoring report
PCN	Project Concept Note
VR	Verification Report
VS	Verification Statement
DAA	Avoidance of Double Accounting Agreement
COD	Commercial Operation Date
PP/PO	Project Proponent / Project Owner
PA	Project Aggregator
PPA	Power Purchase Agreement
ER	Emission Reduction
CoUs	Carbon offset Units.
tCO ₂ eq	Tons of Carbon Dioxide Equivalent
kWh	Kilo-Watt Hour
MWh	Mega-Watt Hour
kW	Kilo-Watt
MW	Mega-Watt
CDM	Clean Development Mechanism
SDG	Sustainable Development Goal
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
GHG	Green House Gas
HEP	Hydro Electric Power
UPPCL	Uttar Pradesh Power Corporation Limited
HVPNL	Haryana Vidyut Prasaran Nigam Limited
HPSEB	Himachal Pradesh State Electricity Board
UPCL	Uttaranchal Power Corporation Limited
PSEB	Punjab State Electricity Board

PDD	Power Development Department, J&K
CED	The Engineering Department, Chandigarh Administration
DTL	Delhi Transco Limited
GoHP	Government of Himachal Pradesh
RRVNL	Rajasthan Rajya Vidyut Prasaran Nigam Limited
MOP	Ministry of Power, Govt. of India.

H. Competence of team members and technical reviewers

No.	Last name	First name	Affiliation	Technical Competence
1.	Vyas	Arjun	Independent Verifier	Mr. Arjun K Vyas is post graduate engineer having more than 10 years of experience in the field of Energy, Power and Carbon mitigation projects. As a verifier, he has diverse portfolio of Renewable Energy Projects. Projects verified by him has gained more than 700k CoUs.
3.	Shah	Kalindi	Outsourced Entity	Mrs. Kalindi Shah is post graduate scientist in the field of Climate Change. Currently, she is acting as technical expert for reviewing the project documents and emission reduction calculations.

I. Document reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UCR	Communication Agreement		PA
2	Creduce	Project Concept Note		PA
3	Creduce	Monitoring Report		PA
4	Creduce	Avoidance of double accounting		PA
5	Creduce	Emission Reduction Excel		PA
6	PP	Daily Generation Report (2014-2021)		PA
7	NCL Pvt Ltd	Meter Calibration Report (2022)		PA
8	YMPL	Meter Calibration Report (2010)		PA
9	UPPCL & PP	Power Purchase Agreement between UPPCL and SJVN		PA
10	HVPNL & PP	Power Purchase Agreement between HVPNL and SJVN		PA
11	HPSEB & PP	Power Purchase Agreement between HPSEB and SJVN		PA
12	UPCL & PP	Power Purchase Agreement between UPCL and SJVN		PA
13	PDD & PP	Power Purchase Agreement between PDD and SJVN		PA
14	CED & PP	Power Purchase Agreement between CED and SJVN		PA
15	DTL & PP	Power Purchase Agreement between DTL and SJVN		PA

16	GoHP & PP	Power Purchase Agreement between GoHP and SJVN		PA
17	RRVPNL & PP	Power Purchase Agreement between RRVPNL and SJVN		PA
18	PP	Single Line Diagram of the Project		PA
19	MOP	Deviation Settlement Accounts (2014-2021)		PA

J. Clarification request, corrective action request and forward action request

Table 1. CLs from this Project Verification

CL ID	xx	Section no.		Date: DD/MM/YY YY
Description of CL				
Project Owner's response				Date: DD/MM/YY YY
Documentation provided by Project Owner				
UCR Project Verifier assessment				Date: DD/MM/YY YY

Table 2. CARs from this Project Verification

CAR ID	01	Section no.	D (a.i)	Date: 06/04/2022
Description of CAR				
<i>The Section B2 para 4 of the Project Concept Note specifies the project as a ROR without the reservoir, but as verified through different documents, it is ROR with the reservoir project. The power density calculated using equation 7 exceeds 4 W/m² criteria.</i>				
Project Owner's response				Date: 26/03/2022
<i>The PCN version 2 will be uploaded at the time of issuance of the CoUs.</i>				
Documentation provided by Project Owner				
<i>PCN version 2</i>				
UCR Project Verifier assessment				Date: 26/03/2022
<i>Corrected PCN version 2 incorporates the corrections. Clarification is accepted.</i>				

Table 3. FARs from this Project Verification

FAR ID	01	Section no.	D (a.v)	Date: 06/04/2022
Description of FAR				
<p><i>The meter calibration and testing certificates were not available with the project proponent. Hence it is required to submit the delayed Calibration reports for the evaluation. Also, the parameter E_{Gy} has to be adjusted according to the below conditions:</i></p> <ol style="list-style-type: none"> <i>1. Apply the maximum permissible error of the instrument to the measured values, if the results of this "delayed" calibration do not show any errors in the measuring equipment or if the error is smaller than the maximum permissible error.</i> <i>2. If error is identified and if the error is beyond the maximum permissible error of the measuring equipment, then apply the error identified in the delayed calibration test. The error shall be applied in a conservative manner such that the adjusted measured values shall result in lower baseline emissions.</i> 				
Project Owner's response				Date: 02/04/2022
<p><i>Certificate No.: NCL/C/2022/61/01 to NCL/C/2022/61/23 has been submitted with an uncertainty in the meter reading as 0.27%. This value is used for the calculation of the Adjusted Electricity Generation for the project activity.</i></p>				
Documentation provided by Project Owner				
<p><i>Latest Calibration Certificates dated 31-03-2022.</i></p>				
UCR Project Verifier assessment				Date: 04/04/2022
<p><i>With reference to the email correspondence with the UCR dated 25-03-2022, a conservative approach is to be followed in this case. The same has been communicated to the PA. The PA has revised the monitoring report and sent the version 2.0 for the verification. The revised ex-post estimation of the CoUs are verified as per the UCR guidelines and to be considered.</i></p>				

ANNEXURE I: Photographs of the Power Plant

Figure-1: Monitoring Room and Electric Panel of the Power Plant



Figure-2: 6 x 250 MW Hydro Turbine inside Power House



Power House of 1500 MW Nathpa Jhakri Hydro Power Station, Jhakri (HP)