
VALIDATION OPINION FOR REVISION OF REGISTERED MONITORING PLAN

Sun-n-Sand Hotels Pvt. Ltd.

**Generation of electricity from 1.2
MW capacity wind mills by Sun-n-
Sand Hotels Pvt. Ltd. at Satara,
Maharashtra**

UNFCCC Ref. No. 0560

SGS Climate Change Programme

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
DR	Document Review
EB	Electricity Board
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
JMR	Joint Meter Reading
MERC	Maharashtra Electricity Regulatory Commission
MP	Monitoring Plan
MSEDCL	Maharashtra State Electricity Distribution Co. Ltd
PDD	Project Design Document
PP	Project Participant
PPA	Power Purchase Agreement
RMP	Revision in Monitoring Plan
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual
WTG	Wind Turbine Generator

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1. Validation Opinion

Paragraph 57 of the modalities and procedures for the CDM allows project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by Sun-n-Sand Hotels Pvt. Ltd. to perform such a validation of the revision of monitoring plan according to the procedure detailed in Annex 28 to EB 49 meeting report; the registered monitoring plan is part of the PDD of registered CDM project "Generation of electricity from 1.2 MW capacity wind mills by Sun-n-Sand Hotels Pvt. Ltd. at Satara, Maharashtra" and UNFCCC Ref No. 0560 and first RMP was taken through RMP version 01 dated 07/08/2008 which is approved on 26/12/2008. The purpose of a validation is to have an independent third party assessment of the revision of monitoring plan. In particular, the level of accuracy and/or completeness in the proposed revision of the monitoring plan, and the conformity with approved monitoring methodology applicable to the project activity.

By applying the proposed revision of monitoring plan, the project participant would like to make the verification process more transparent and accurate.

The revision in the monitoring plan has been proposed due to three main reasons due to FAR in previous verification report:

1. As per registered PDD, PP need to consider weighted average emission factor of the current generation mix; however the same parameter has not included in the revised monitoring plan (approved on 26/12/2008).
2. Revised monitoring plan (approved on 26/12/2008) mentions main meter with accuracy class of 0.2s; however main meter with accuracy 0.5s was there on site till 25/08/2011. From 26/08/2011, onwards, main meter of 0.2 s accuracy was installed.
3. As per QA/QC procedure of the revised monitoring plan (approved on 26/12/2008), PP needs to install Check meter. No check meter was there on site till 25/08/2011^{13/}. New Check meter of 0.2 s accuracy is present on site from 26/08/2011 onwards.

Hence, to improve the transparency and completeness of monitoring procedure in compliance with the applied Monitoring Methodology AMS I.D Version 08 the PP has included the parameter, "EF_y - CO₂ emission factor for the electricity displaced due to the project activity", in section D.3 of the revised monitoring plan. The main meter of 0.2 s accuracy class is installed at site in line with earlier RMP approved on 26/12/2008 and Check meter of 0.2 s accuracy class is installed. Thus proposed RMP has correctly mentioned the accuracy class of check metres as 0.2s. Also formula to calculate EG_y is made clear and transparent for both the cases i.e. electricity sale to grid and third party by the project activity; hence inclusion of EG_{third party} and EG_{MSEDCL}. Recording frequency for monitoring parameters electricity exported and imported are mentioned as 'continuously monitored and monthly recorded' which is found to be in line with observations made during site visit to the project activity. The recording frequency of parameter EG_y has been changed from continuously to monthly. Data unit mentioned for all monitoring parameters is corrected as MWh instead of MWh/yr. Information provided on monitoring parameter 'EG_{loss}' is made clear in line with applicable MERC guidelines. Also line diagram indicating monitoring equipments and organizational structure are included in section D.4 and D.5 of the proposed RMP respectively. The calibration frequency has been transparently mentioned as per MSEDCL procedure.

Theoretically, there is be no impact on the calculation of the emissions reduction achieved by this project activity because the revision is only aimed at making the calculation of the parameter EG_y transparent and complete.

This revision improves the accuracy of information provided and consistency in the registered PDD and the monitoring plan.

Furthermore, we confirm that:

(a) the proposed revision points have been described, and an assessment has been provided to substantiate the reasons for each of the proposed revision points of the registered monitoring plan, using objective evidence;

- (b) the proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revisions;
- (c) the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity whilst ensuring the conservativeness of the emission reductions calculation.
- (d) the findings of the previous verification reports, have been taken into account.

Signed on Behalf of the Validation Body by Authorized Signatory

A handwritten signature in blue ink, appearing to read 'Siddharth', with a long horizontal stroke extending to the right.

Signature:

Name: Siddharth Yadav

Date: 30-04-2012

2. Introduction

2.1 Objective

Paragraph 57 of the modalities and procedures for the CDM allows project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by Sun-n-Sand Hotels Pvt. Ltd. to perform such a validation of the revision of monitoring plan according to the procedure detailed in Annex 28 to EB 49 meeting report; the registered monitoring plan is part of the PDD of registered CDM project "Generation of electricity from 1.2 MW capacity wind mills by Sun-n-Sand Hotels Pvt. Ltd. at Satara, Maharashtra" and UNFCCC Ref No. 0560, and first RMP was taken through RMP version 01 dated 07/08/2008 which is approved on 26/12/2008. The purpose of a validation is to have an independent third party assessment of the revision of monitoring plan. In particular, the level of accuracy or completeness in the proposed revision of the monitoring plan, and the conformity with the approved monitoring methodology applicable to the project activity.

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM) and the host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

SGS reviewed the project design documentation (revised monitoring plan), using a risk based approach and conducted follow-up interviews.

2.2 Scope

The scope of the validation is defined as an independent and objective review of revision of monitoring plan. The information in these documents is reviewed against the Kyoto Protocol requirements, the UNFCCC rules and associated interpretations.

The validation is not meant to provide any consulting towards the Client/the project. However, SGS may issue requests for clarifications and/or corrective actions which may provide input for improvement of the project design.

2.3 GHG Project Description

Refer to <http://cdm.unfccc.int/Projects/DB/RWTUV1155575551.27/view>, the project web page. There is no change in the project activity description. The project was registered on 01/10/2006 under UNFCCC ref. no. 0560.

3. Methodology

3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors using a validation protocol.

A site visit was carried out to verify assumptions in the baseline.

3.2 Use of the Validation Protocol

The validation protocol used for the assessment is partly based on the templates of the CDM Validation and Verification Manual Version 1.2 dated 30th July 2010 (EB 55 Annex1):

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y/OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

The validation protocol is attached with the report as Annex 1.

3.3 Findings

As an outcome of the validation process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **Clarification Request (CL)** specifying what additional information is required.

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR)**. A CAR is issued, where:

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

A Forward Action Request (FAR) is raised during verification for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a CL/FAR may result in a CAR. Information or clarifications provided as a result of a CL/FAR may also lead to a CAR.

Corrective Action Requests, Clarification Requests and Forward Action Requests are raised in the draft validation protocol and detailed in a separate form (Findings Overview). In this form, the Project Developer is given the opportunity to address and "close" outstanding CARs and respond to CLs and FARs. The detailed Finding Overview is attached with this document as Annex 2.

3.4 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

4. Validation Findings

4.1 Application of Monitoring Methodology and Monitoring Plan

Type of Revision

The revision of monitoring plan is a result of a recommendation by the PP/DoE as mentioned in section D.3 and D.4 of the registered PDD^{2/}. The changes as a result of the proposed RMP^{1/} are:

1. Inclusion of the weighted average emission factor as a monitoring parameter
2. The Check meter was installed at site and accuracy class of the check meter is mentioned as 0.2s. The main meter of correct accuracy class i.e 0.2 s is installed on site from 26/08/2011 onwards in line with first RMP approved on 26/12/2008.

Also based on observation made during site visit to the project activity, below changes are proposed in the proposed RMP^{1/};

3. Change in description of the transmission losses based on the prevailing guidelines^{10/} of the regulatory authority.
4. Change in the formula to calculate EG_y i.e. net electricity supplied in both the cases of electricity sale to third party and electricity exported to the grid.
5. Inclusion of EG_{third party} and EG_{MSEDCL} as monitoring parameters in section D.3 of the proposed RMP.
6. Change in recording frequency from 'continuously' to 'continuously monitored, recorded monthly' for monitoring parameters EG_{export} and EG_{import} and from continuously to monthly for EG_y parameter
7. Change of data unit for all monitoring parameters as MWh instead of MWh/yr.
8. Inclusion of line diagram indicating monitoring equipments and organizational structure along with roles and responsibility in section D.4 and D.5 of the proposed RMP respectively.
9. The calibration frequency has been transparently mentioned as annual as per MSEDCL procedure.

The proposed revision of the monitoring plan ensures that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revisions (details below).

The proposed revision includes the following changes

(1) Inclusion of the weighted average emission factor as a monitoring parameter:

To address the FAR raised during the previous verification^{6/}, the following parameter has now been defined in the proposed RMP^{1/}:

No.	Parameters	Remarks
1.	EF _y – CO ₂ emission factor for the electricity displaced due to the project activity	Yearly recording

The CO₂ emission factor would be the weighted average emission rate of the current generation mix provided in the latest version of the CO₂ baseline database published by Central Electricity Authority (CEA), Ministry of Power Government of India. It has been justified through the discussions under CL #4 of the previous verification report^{6/}, that the weighted average emission factor is more conservative than the combined margin approach to calculate the CO₂ emission factor. Hence, the approach followed for the calculation of this parameter is appropriate and the same is included as a monitoring parameter.

(2) Main meter of 0.2 s accuracy class (in line with first RMP approved on 26/12/2008) is installed and Check meter of 0.2 s accuracy class is installed at site. The accuracy class of the check meter is revised as 0.2s:

It has been mentioned in the second verification report^{/6/} for this project activity that the accuracy class of the main meter at site was 0.5s. This was inconsistent with the accuracy class of 0.2s for main meter mentioned in the RMP^{/5/} approved on 26/12/2008. This issue has been discussed under CL #2 of the second verification report^{/6/} of this project activity. During second verification of the project activity, the PP applied maximum permissible error to both electricity exported and electricity imported by the project activity and same approach will be followed for the period till main meter is installed in current monitoring period; this is accepted based on principle of conservativeness. Also it was discussed that as per the first RMP approved on 26/12/2008, check meter needs to be installed at site. However check meter was optional as per PPA signed for the project activity and it is the choice of the PP; hence in line with FAR #1, RMP is proposed to mention actual condition at site for check meter. But during site visit carried out for third monitoring period and proposed RMP, it is found that the PP installed a check meter (Sr. No. 05245386) on 26 - 27/08/2011 with accuracy class 0.2s. Also old main meter (Sr. No. 52719) with accuracy class of 0.5s was found to be replaced with a new one (Sr. No. 05245385) with improved accuracy class of 0.2s on 26 - 27/08/2011. This is checked and confirmed from meter replacement letter from MSEDCL, Testing Division (Ref. EE/TEST/STR/T No 1185) dated 29/09/2011^{/13/}; hence this is accepted. It is to be noted that the meter replacement letter mentioned two dates as 26/08/2011 and 27/08/2011 for meter replacement and testing. Since installation of main meter with improved accuracy class of 0.2s contributes towards improved QA/QC procedure for monitoring of net electricity supplied to grid. Thus provision of main meter in RMP^{/5/} approved on 26/12/2008 this is kept consistent. Also accuracy class of check meter is changed to 0.2s in proposed RMP^{/1/} from 0.5s as mentioned in RMP^{/5/} approved on 26/12/2008 as installed check meter is more accurate.

The RMP^{/1/} has been proposed to address the FAR raised during the previous verification^{/6/} and to correctly mention the accuracy class of the main meter as 0.2s and to check the requirement of the check meter at project site. There is no possibility of accuracy reduction due to the implementation of the proposed RMP^{/1/}.

(3) Change in the description of the transmission losses based on the prevailing guidelines^{/10/} of the regulatory authority in case of third party sale of electricity:

It has been mentioned in the RMP approved on 26/12/2008 that “in case of third party sale 5 % of the net electricity exports are deducted as transmission losses as per MERC guidelines”.

The Open Access Wheeling Sample Illustration and Explanatory Note^{/10/} published by the state regulatory authority mentions that “Depending on the nature of open access transaction, the injection point(s) and drawal point(s) for open access wheeling transaction could lead to use of distribution assets of multiple distribution licensees and/or use of intra-state transmission system. Even in case of particular distribution licensees, the wheeling charges applicable for a particular open access transaction shall depend on voltage level at injection point(s) and drawal point(s), as wheeling charges are determined in accordance with voltage level. Accordingly, transmission charges, transmission losses, wheeling charges and wheeling losses applicable for a particular transaction have to be ascertained on the basis of use of assets of concerned licensee and extent of use at a particular voltage level.”

Based on above explanations the state regulatory authority has arrived at the transmission losses and wheeling losses in a range from 4.85% to 14% for different distribution licensees at various voltage levels. This is solely in the control of the state regulatory authority. Hence, the change in the description of the transmission loss in the proposed RMP i.e. “in case of third party sale, transmission losses and wheeling losses to be calculated as per MERC guidelines” is appropriate. This has no impact on previously issued emission reductions for the project activity as same has been followed as per MERC guidelines.

(4) Change in the formula to calculate EG_y i.e. net electricity supplied in both the cases of electricity sale to third party and electricity exported to the grid:

Revised Monitoring Plan^{/5/} approved on 26/12/2008 mentions the formula for calculation of Net Electricity supplied to state grid (E_{gy}) is as follows:

$$EG_y = EG_{\text{export}} - EG_{\text{import}} - EG_{\text{loss}}$$

Where,

- EG_{export}, the electricity exported to NEWNE Grid represents the difference of gross electricity generated at the wind turbines of the project activity and the line losses up to grid interconnection point (i.e. “joint meter”).

- EG_{import} represents the auxiliary consumption at the wind turbines.
- EG_{loss} in case of third party sale, transmission losses and wheeling losses to be calculated as per MERC guidelines.

Also RMP^{/5/} was mentioned that EG_{loss} will be zero in case of electricity sale to MSEDCL. However, from above formula, it was not clear whether EG_{import} is being deducted along with EG_{loss} from the value of EG_{export} in case of electricity sale to the third party. Hence during site visit to third verification and RMP of the project activity, clarification was sought to the project participant regarding same. It is understood that in case of electricity sale to the third party, net electricity supplied (EG_y) is being calculated as difference of electricity exported (EG_{export}) and transmission losses and wheeling losses (EG_{loss}) which are being calculated as per MERC guidelines. There is no further deduction of auxiliary consumption (EG_{import}) from electricity exported (EG_{export}). This is checked and confirmed from credit reports^{/12/} and invoices^{/11/} submitted by the project participant for the project activity. Thus proposed RMP mentions two different formulae for calculation of Net Electricity supplied (EG_y) from the project activity as follows;

1. In case of electricity sale to a third party

$$EG_y = EG_{third\ party} = EG_{export} - EG_{loss}$$

2. In case of electricity sale to MSEDCL

$$EG_y = EG_{MSEDCL} = EG_{export} - EG_{import}$$

Now this is in line with the actual calculation approach being followed for calculation of Net Electricity supplied (EG_y) and it is also found to be consistent with the applied monitoring methodology for the project activity; hence it is accepted.

(5) Inclusion of $EG_{third\ party}$ and EG_{MSEDCL} as monitoring parameters in section D.3 of the proposed RMP:

In line with above discussion on transparent approach towards the calculation of Net Electricity supplied (EG_y) in both cases i.e. third part sale and electricity sale to MSEDCL; PP included $EG_{third\ party}$ and EG_{MSEDCL} in section D.3 of the proposed RMP. This is just to have a more clear and transparent approach for calculation of net electricity supplied in both the cases i.e. electricity sale to third party and grid (MSEDCL) and it has no impact on emission reduction calculations for the project activity. This is found to be appropriate and it is accepted.

(6) Change in recording frequency from 'continuously' to 'continuously monitored, recorded monthly' for monitoring parameters EG_{export} and EG_{import} and from continuously to monthly for parameter EG_y :

Revised Monitoring Plan^{/5/} approved on 26/12/2008 mentioned recording frequency as 'continuously' for monitoring parameters EG_{export} and EG_{import} . It is not feasible to record and report electricity export and import data continuously. Energy meter installed for the project activity do continuously measure data; however same is being recorded monthwise in terms of monthly joint meter readings. Hence, proposed RMP mentions recording frequency as 'continuously monitored, monthly recorded' for monitoring parameters EG_{export} and EG_{import} . Also recording frequency for monitoring parameter Net Electricity supplied (EG_y) is mentioned as Monthly instead of continuously; it is found to be in line with actual monitoring practice being followed at site and it is also in line with the applied monitoring methodology for the project activity; hence it is accepted. This proposed change doesn't impact emission reduction calculation in anyway.

(7) Change of data unit for all monitoring parameters as MWh instead of MWh/yr:

Revised Monitoring Plan^{/5/} approved on 26/12/2008 mentioned data units for all monitoring parameters as MWh/yr which is inappropriate and same is corrected as MWh in the proposed RMP. This change has no impact on emission reduction calculations for the project activity.

(8) Inclusion of line diagram indicating monitoring equipments and organizational structure in sections D.4 and D.5 of the proposed RMP respectively.

The PP included a line diagram indicating monitoring equipments and organizational structure in sections D.4 and D.5 of the proposed RMP respectively in order to have better transparency. This has no impact on emission reduction calculations for the project activity either. As per registered PDD, project boundary encompasses the physical, geographic site of wind mills and same is represented through line diagram which shows the two WTGs, their main meter and check meter, Substation and state electricity grid.

(9) The calibration frequency has transparently mentioned as annual as per MSEDCL procedure

Proposed revised RMP^{1/} mentions that calibration/testing of monitoring equipments installed for the project activity will be done annually. During the site visit to the project activity, it is observed that MSEDCL is carrying out calibration of these energy meters annually. Also CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006 which is considered as national standard mentions that *“All interface meters shall be tested at least once in five years.”* Hence annual calibration frequency considered for the project activity is found to be conservative. This is found to be appropriate and it is accepted.

The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity (details below).

This revision improves the accuracy of information provided and consistency in the registered PDD and the monitoring plan approved on 26/12/2008.

The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity. It has been further assured that there will be no effect by revision in the monitoring plan on the original chosen baseline mentioned in the registered PDD^{2/} and it will remain the same.

AMS I.D, version 08^{7/} is applicable to renewable energy units “that supply electricity to and/ or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit”. As stated in the registered PDD^{2/}, and the RMP^{5/} the project activity was proposed by PP to install 2 WTGs of individual capacity 0.6 MW each aggregated to a total installed capacity of 1.2 MW. The generated electricity from the aforesaid wind farm is either sold to the grid or a third party under a power purchase agreement as indicated in the approved RMP^{5/}. In case of third party sale, transmission and wheeling losses are to be calculated as per MERC guidelines. The addition of the parameter E_{fy} (emission factor) as a monitoring parameter is due to a FAR raised in the previous verification^{6/}. The same procedure, as in the previous verification, is being followed to calculate E_{fy} and it is now being transparently monitored.

Possible impacts on emission reduction calculations due to change in monitoring plan:

The electricity export to the grid represents the realistic quantity of carbon intensive electricity being displaced from the grid system generation mix. Thus, accounting of electricity export to the grid provides the most accurate and conservative determination of emission reduction calculation for a grid connected renewable energy power plant like as in the current project activity. The main meter installed at the grid substation is sealed and maintained (tested & calibrated) by the grid authority only and the project proponent does not have any intervention on that procedure. As per the electricity monitoring pattern observed in grid connected renewable energy projects the entire generated electricity is being evacuated to the grid after deducting import from grid and auxiliary consumption and Line losses between the individual WTG and the sub-station meter. The electricity monitoring is governed by the Terms and Conditions as mentioned in the PPA signed with the respective Electricity Board. As commonly observed, the electricity supplied to the grid is being monitored through a set of energy meters (Main meter and Check meter) installed at the grid interface. These energy meters are owned and are under the control of respective electricity authority. As per the conditions of the PPA project participants can not intervene into this metering process. Thus consideration of E_{gy} values as mentioned in the monthly JMR sheet issued by MSEDCL for calculation of the emission reduction calculation will not impact the materiality of the emission reduction calculation for the current project activity. The proposed monitoring plan improves accuracy and transparency.

As per paragraph 9 of the approved methodology AMS I.D version 08^{7/}, the applicable indicative simplified baseline and monitoring methodology is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kgCO₂/kWh) calculated in a transparent and conservative manner. It is noted that the emission factor as weighted average emissions of the current generation mix is included as monitoring parameter in revised monitoring plan. Since this approach is found conservative and in line with

step 9(b) of AMS I.D version 08, hence it can be confirmed that there will not be any impact on the materiality of the emission reduction calculation for the current project activity. Hence there will be no change in emission reduction calculation due to change in monitoring plan.

Rest of the monitoring plan remains the same as mentioned in the RMP^{/5/} approved on 26/12/2008 available at UNFCCC website <http://cdm.unfccc.int/Projects/DB/RWTUV1155575551.27/view> and the proposed RMP^{/1/} is attached with the revised validation opinion.

This proposed revision improves the accuracy & transparency of information already provided in the RMP^{/5/} approved on 26/12/2008.

Discussion on CAR/CL:

CL #1 was raised to ask PP to clarify whether the monitoring parameter EG_{loss} includes electricity imported by the project activity in case of third party sale. Also the PP was requested to clarify appropriateness of formula $EG_y = EG_{export} - EG_{import} - EG_{loss}$ being used for calculation net electricity supplied to grid by the project activity. In response, the PP clarified that the monitoring parameter EG_{loss} includes electricity imported by the project activity in case of electricity sale to third party. Same is checked and confirmed from credit notes and invoices submitted by the project participant for the project activity; hence it is accepted. Also the PP submitted revised RMP dated 25/04/2012^{/1/} which mentioned separate formulas for calculation of net electricity supplied in case of third party sale and exported to MSEDCL. This is found to be appropriate and it is accepted. Thus **CL #1** is closed out.

Version 01 of the proposed RMP was mentioned recording frequency as 'continuously measured, calculated monthly' for monitoring parameters EG_{export} and EG_{import} ; hence **CAR #2** was raised to ask the PP to clarify the appropriateness of the recording frequency mentioned. In response, the PP submitted revised proposed RMP with recording frequency mentioned as 'continuously monitored, recorded monthly' for monitoring parameters EG_{export} and EG_{import} . This is found to be in line with actual monthly recording frequency being followed in terms of joint meter readings for both monitoring parameters. This is found to be appropriate and it is accepted; thus **CAR #2** is closed out.

CAR #3 is raised to ask PP to clarify below points;

- Please clarify why registered PDD template has not been followed by taking into account already approved RMP.
- The line diagram is not transparent enough. It is not clear about metering arrangement i.e. main meter, check meter etc. Please clarify.
- Please clarify why the calibration interval is not mentioned for metering equipment in section D.4 of the proposed RMP.
- Please clarify why organizational structure is not mentioned in section D.5 of the proposed RMP.

In response, the PP submitted proposed RMP in registered PDD template along with inclusion of line diagram indicating location of main meter and check meter and organization structure in sections D.4 and D.5 of the proposed RMP. This is found to be appropriate and it is accepted. Also calibration interval is mentioned as yearly which is found to be in line with observation made during site visit to the project activity. Thus **CAR #3** is closed out.

Detailed discussion on above CAR/CL is included in Annex 2 of this report.

4.2 Findings of Previous Verification Reports

FAR #1 was raised in the previous verification report^{6/} dated 04/12/2009 for the second verification period – “It was observed that the Weighted Average emission factor is always conservative than the combined margin approach and weighted emission factor needs to be monitored. However registered PDD^{2/} and revision in monitoring plan approved on 26/12/2008 does not mention about the monitoring of Weighted Average emission factor as per the latest available version of Central Electricity Authority (CEA). Project participant needs to revise the monitoring plan accordingly prior to next verification (third verification). Also the PP was asked to revise the monitoring plan in regards to accuracy class of main meter and presence of check meter on site consistent with the observations made during site visit to project activity as discussed above in section 4.1 of this report.”

In response to this FAR, PP has defined the parameter EF_y i.e. CO₂ emission factor for the electricity displaced due to the project activity. The CO₂ emission factor would be the weighted average emission rate of the current generation mix provided in the latest version of the CO₂ baseline database published by Central Electricity Authority (CEA), Ministry of Power, Government of India. The approach adopted by the PP is appropriate and it is accepted. Check meter is installed and accuracy class of check meter has been changed from 0.5 to 0.2s and main meter of correct accuracy class is installed in line with RMP approved on 26/12/2008 and proposed RMP^{1/} now reflect the same.

The revision in the monitoring plan due to this FAR will not affect the previous verification (second verification). During the previous verification, the emission reductions were calculated using same approach discussed in the RMP^{1/}, however, the procedure mentioned for CO₂ emission factor was not transparent. Now, the procedure has been clearly demonstrated in the revised monitoring plan and the above sections of the report.

5. List of Persons Interviewed

Date of site visit	Name	Position	Short description of subject discussed
25/02/2012	Mr. Sushil Bohra	Dy. A/c Manager (Sun-n-Sand)	CDM monitoring & reporting documentation Quality Assurance – Management and operating system. Verification of monitoring and data handling procedure (reporting, recording and data archiving)
25/02/2012	Mr. Bhumayya Pallikonda	Sr. A/c Supervisor (Sun-n-Sand)	CDM monitoring & reporting documentation Quality Assurance – Management and operating system. Verification of monitoring and data handling procedure (reporting, recording and data archiving)
25/02/2012	Mr. Selvakumar R	Assistant Manager (PWC) – Consultant	Confirmation on data collection and handling procedures. Revision in Monitoring Plan. CDM monitoring & reporting documentation Quality Assurance – Management and operating system. Verification of monitoring and data handling procedure (reporting, recording and data archiving)
25/02/2012	Mr. Vaibhav Sharma	Assistant Manager (EIL)	Monitoring and measuring system Collection of measurements Observations of established practices Data Verification of monitoring parameters

6. Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

- /1/ Revised Monitoring Plan Version 02 dated 25/04/2012 (track change)
- Revised Monitoring Plan Version 02 dated 25/04/2012 (clean mode)

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

- /2/ Registered PDD version 02 dated 21/07/2006
- /3/ Validation Report, dated 13/08/2006 issued by TUV Nord (Report No. 53128205 – 05/30)
- /4/ First Verification report dated 09/07/2007 issued by TUV Nord (Report No. 53144806-06/91-V01)
- /5/ RMP Version 01 dated 07/08/2008 requested by TUV NORD on 26/08/2008 and same is approved on 26/12/2008
- /6/ Second Verification report versión 03 dated 04/12/2009 issued by SGS
- /7/ Applied Methodology: AMS I.D Version 08
- /8/ UNFCCC Project Web Page:
<http://cdm.unfccc.int/Projects/DB/RWTUV1155575551.27/view>
- /9/ Clean Development Mechanism Validation and Verification Manual, Version 1.2
- /10/ Open Access Wheeling Illustration & Explanatory Note published by MERC
http://www.mercindia.org.in/pdf/Order%2058%2042/Open_Access_Wheeling_Charges_2010_11.pdf
- /11/ Invoices raised by project participant for project activity
- /12/ Joint Meter Reading Reports/Credit Reports issued by MSEDCL
- /13/ Meter replacement letter from MSEDCL, Testing Division (Ref. EE/TEST/STR/T No 1185) dated 29/09/2011



Annex 1: Validation Protocols

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
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Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.1. General Requirements <i>(Note that the sections A.1.1- A.1.4 may be completed after the other sections are completed)</i>				
A.1.1. Is the revision in the monitoring plan based on a decision by the CDM EB	EB49, Annex 29	DR	The revision in the monitoring plan is not based on a decision by the CDM EB. The revision is based on FAR raised during previous (second) verification and other revisions proposed by PP/DOE.	Y
A.1.2. Is the revision based on a decision by CDM EB but also additional revisions are proposed by the PP/DOE	EB49, Annex 29	DR	The revision in the monitoring plan is not based on a decision by the CDM EB. The revision is based on FAR raised during previous (second) verification and other revisions proposed by PP/DOE.	Y
A.1.3. Is the need for revision in monitoring plan spotted during the first monitoring period?	EB49, Annex 29 Project page on UNFCCC website	DR	This is the third verification of this project activity. The proposed RMP is due to a FAR raised in the second verification.	Y
A.1.4. Is the revised monitoring plan complete and does the revised monitoring plan follow the registered PDD template?	Registered PDD	DR	The revised monitoring plan is complete and plan follows the registered PDD template by taking account the RMP approved on 26/12/2008.	Y
A.1.5. Has the revised monitoring plan submitted in track change mode for each of the revision point (issue)?	Revised monitoring plan	DR	The revised monitoring plan has been submitted by the PP in track change mode for each of the revision point (issue).	Y
A.1.6. is there an objective evidence for each of the proposed revision point (issue)?		DR	The accuracy class of the meters was verified during the site visit and was found to be 0.2s. MERC guidelines have been checked for transmission and wheeling losses.	Y
A.1.7. Does the revised monitoring plan also include the Annex 4?	Registered PDD	DR	There is no Annex 4 in the registered PDD and the revised monitoring plan. The detailed monitoring plan has been explained in section D.4 of the revised monitoring plan.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.1.8. Does the revised monitoring plan lead/associate to any kind of change in the project registered design?	Registered PDD & EB48 Annex 66-67	DR	The proposed revision in the monitoring plan was checked against EB 48 annex 66 and 67. The revised monitoring plan does not lead to any kind of change in the project registered design.	Y
A.2. Data and Parameters Monitored				
A.2.1. Does the revised monitoring plan in the PDD comply with the approved methodology provided for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?	VVM Para. 91a/91d/121 Revised MP Section B.7 EB49, annex 2, para 9	DR	The revised monitoring plan has been found to be in compliance with the approved methodology AMS I.D Version 8 used for the project. The monitoring plan now includes all necessary parameters and has been clearly described. Implementation of the revised monitoring plan will make the monitoring process more transparent and accurate. This has been confirmed by reviewing the revised monitoring plan and interviewing relevant site personnel during the site visit. The arrangements described in the monitoring plan are found to be feasible within the project design. The process of collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary are found to be satisfactory. The parameters introduced by the PP as a part of the revised monitoring plan have been described in detail in section D.3 of the PDD.	Y
A.2.2. Are the changes in the monitoring plan inline to the applied methodology and tool?	AMS ID version 08	DR	The changes in the monitoring plan are in line with the approved monitoring methodology AMS I.D version 08 which was used in the registered PDD. Recording frequency is changed from 'continuously' to 'continuously monitored, month recorded' through CAR #2.	CAR #2 Y CAR #2 is closed out.
A.2.3. Are the changes affecting the ER calculation (directly/indirectly)?	Revised MP	DR	The addition of the parameter EFy (emission factor) as a monitoring parameter is due to a FAR raised in the previous verification. The same procedure, as in the previous verification, is being followed to calculate EFy and it is now being transparently monitored. As per the applied methodology, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kgCO ₂ /kWh) calculated in a transparent and conservative manner. Thus the baseline of the project activity would still remain the same. Hence there will be no change in emission reduction calculation due to change in monitoring plan.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.2.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	RMP Section B.7	DR	The proposed revisions in monitoring plan are reflected in table under section D.3, the parameters related to this revision are compliance with the sufficient information describing the intentions of the project participants and is detailed enough to assess the appropriateness. The revision is aimed to make the parameter EGy more transparent and clear.	Y
A.2.5. Has there been an issuance with the original monitoring plan of the registered PDD in the past? A.2.6. if so how did the identified gaps effect the ER calculations for the monitoring periods in the past?	Project page on UNFCCC website	DR	<p>The project was registered on 01/10/2006 with UN Ref No 0560. There has been 2 issuances for this project activity:</p> <p>1st issuance covers the monitoring period 01 Apr 2002 - 30 Sept 2006 with the original monitoring plan 2nd issuance covers the monitoring period 01 Oct 2006 - 31 Dec 2008 with the RMP approved on 26/12/2008</p> <p>During the above mentioned monitoring periods, the ERs were calculated on the basis of JMR sheet and the break up sheets issued by the EPC contractor "EIL". The weighted average emission factor has been used conservatively for previous verification. Hence, there should be no gaps that would have affected the ER calculations.</p> <p>Also, the issued CERs are based on the value of EGy which was a calculated parameter and this revision is just to make the calculations more clear and transparent. The previous verifications has followed same conservative approach for emission factor as per registered monitoring plan. Thus there is no over issuance due to the use of original monitoring plan.</p> <p>CL #1 is raised to ask PP to clarify the appropriateness of formula used for calculation of EGy. In response, PP mentions both the cases separately i.e. electricity sale to third party and MSEDCL. This is found to be appropriate and it is accepted; thus CL #1 is closed out.</p>	CL #1 Y CL #1 is closed out
A.2.7. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high	RMP Section – B.7	DR	The revision in monitoring plan is aimed to make the calculation of the parameter EGy more transparent and clear. The value of this parameter will be a calculated and thus will ensure the verifiability of data quality and correctness.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
quality data free of potential for biases or intended or unintended changes in data records?				
A.2.8. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	RMP Section-B.7	DR	Since proposed revision is based on the present monitoring approach followed at the site, hence this approach is in line with current good practices.	Y
A.2.9. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	Revised MP Section -B.7	DR	No project emissions are envisaged in the project activity and this component is not included in the registered PDD.	Y
A.3. Quality Control (QC) and Quality Assurance (QA) Procedures				
A.3.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	VVM Para. 121	DR	Yes the selection of data undergoing quality control and quality assurance procedures as described in section D.4 of the revised monitoring plan. The means of implementation of the proposed monitoring plan, including the data management and quality assurance, are sufficient to ensure that the emission reductions achieved by/resulting from the registered CDM project activity can be reported ex post and verified.	Y
A.3.2. in case, a revision is proposed, the impact of the revision should be assessed and it not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9	DR	The proposed revision in monitoring plan is improving the level of accuracy and completeness in the monitoring and verification process.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.3.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	VVM Para 121	DR	The QA/QC procedures described in the RMP are sufficiently described to ensure the delivery of high quality data.	
A.3.4. Is it ensured that data will be bound to national or internal reference standards?	VVM Para. 86d	DR	The monitoring data will be clearly reproducible and comparable and will not be dependent on site-specific adjustments.	
A.4. Operational and Management Structure				
A.4.1. Is the authority and responsibility of project management clearly described?	PDD Section B.7.2 /Annex 4	DR	The authority and responsibility of project management has been described in section D.5 of the RMP	Y
A.4.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD Section B.7.2/Annex 4	DR	The authority and responsibility for registration, monitoring, measurement and reporting has been described in section D.5 of the RMP.	Y
A.5. Monitoring Plan (Annex 4)				
A.5.1. Does the monitoring plan completely describe all measures to be implemented for monitoring all parameter required, including measures to be implemented for ensuring data quality?	VVM Para. 122b	DR	The monitoring plan has been completely described in the section D.3 and D.4 and information for all monitoring parameters have been explained in the revised monitoring plan.	Y
A.5.2. Does the monitoring plan provide information on monitoring equipment and	VVM Para. 122b	DR	PP has provided a line diagram indicating the metering points in section D.4 of the RMP which is consistent with the actual situation at the site.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
respective positioning in order to safeguard a proper installation?				
A.5.3. Is there any change proposed in the specifications of the monitoring equipment or their positioning or installation then the impact of the change due to revision should be assessed and it not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9	DR	The changes of the monitoring equipment or their positioning or installation are completely under control of state electricity board and PP does not have any control on it. The current RMP does not propose any change in positioning of monitoring equipments. The proposed RMP corrects the accuracy class as 0.2 s instead of 0.5s mentioned for check meter in earlier RMP approved on 26/12/2008.	Y
A.5.4. Are procedures identified for calibration of monitoring equipment?	VVM Para. 122a-c	DR	Procedures for calibration of monitoring equipment have been identified.	Y
A.5.5. Is there any change proposed in the calibration procedures, if yes then the impact of the change due to revision should not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9	DR	There are no changes proposed in the calibration procedures	Y
A.5.6. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	VVM Para. 122a-c	DR	The procedures for day-to-day records handling have been identified.	Y
A.5.7. Are procedures identified for project performance reviews	VVM Para. 122a-c	DR	The procedures for project performance reviews before data is submitted for verification have been identified.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
before data is submitted for verification, internally or externally?				

Annex 2: Overview of Findings

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	01	01	-

Date:	10/04/2012	Raised by:	Vikas Bankar		
Type:	CL	Number:	01	Reference:	Proposed RMP (D.3)
Lead Assessor Comment:			Date: 10/04/2012		
PP is requested to clarify whether the monitoring parameter EGloss includes electricity imported by the project activity in case of third party sale.					
If above is the case, then please clarify the appropriateness of formula $EG_y = EG_{\text{export}} - EG_{\text{import}} - EG_{\text{loss}}$ being used for calculation net electricity supplied to grid by the project activity.					
Project Participant Response:			Date: 16/04/2012		
As per the MSEDCL monthly credit note, when there is a third party sale, net energy exported to grid (Units for Credit) is calculated after deducting the losses.					
The formula is revised to address the above comment.					
Documentation Provided as Evidence by Project Participant:					
Revised RMP					
Information Verified by Lead Assessor:					
Revised RMP dated 13/04/2012 is checked for appropriateness of formula used for calculation of net electricity supplied to grid.					
Reasoning for not Acceptance or Acceptance and Close Out:			Date: 18/04/2012		
It is understood that the monitoring parameter EGloss includes electricity imported by the project activity in case of electricity sale to third party. Same is checked and confirmed from credit notes and invoices submitted by the project participant for the project activity. This is found to be appropriate and it is accepted.					
Revised RMP dated 13/04/2012 now mentions separate formulas for calculation of net electricity supplied in case of third party sale and exported to MSEDCL. It is understood that in case of third party sale, net electricity supplied will be calculated by deducting EG_{loss} from the value of EG_{export} . Net electricity supplied grid will be calculated as difference of EG_{export} and EG_{import} . This is checked and confirmed from credit notes and invoices submitted by the project participant in both the cases. This is found to be appropriate and it is accepted.					
Thus CL #1 is closed out.					
Acceptance and Close out by Lead Assessor:			Date: 18/04/2012		

Date:	10/04/2012		Raised by:	Vikas Bankar		
Type:	CAR	Number:	02		Reference:	Proposed RMP (D.3)
Lead Assessor Comment:				Date: 10/04/2012		
Proposed RMP mentions monthly calculated in the column of recording frequency for monitoring parameters EG _{export} and EG _{import} . Please clarify the appropriateness of the same.						
Project Participant Response:				Date: 13/04/2012		
It is a typographical error. RMP is revised to address the same.						
Documentation Provided as Evidence by Project Participant:						
Revised RMP						
Information Verified by Lead Assessor:						

Revised RMP dated 13/04/2012 is checked for appropriateness of recording frequency mentioned for monitoring parameters EG _{export} and EG _{import} .					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 18/04/2012	
Revised RMP dated 13/04/2012 mentions continuous monitoring and monthly recording for monitoring parameters EG _{export} and EG _{import} . This is found to be appropriate and it is accepted. Thus CAR #2 is closed out.					
Acceptance and Close out by Lead Assessor:				Date: 18/04/2012	

Date:	25/04/2012	Raised by:	Vikas Bankar		
Type:	CAR	Number:	03	Reference:	Proposed RMP
Lead Assessor Comment:				Date: 10/04/2012	
Please clarify why registered PDD template has not been followed by taking into account already approved RMP. The line diagram is not transparently enough. It is not clear about metering arrangement i.e. main meter, check meter etc. Please clarify. Please clarify why calibration interval is not mentioned for metering equipment in section D.4 of the proposed RMP. Please clarify why organizational structure is not mentioned in section D.5 of the proposed RMP.					
Project Participant Response:				Date: 25/04/2012	
<i>RMP is revised as per the PDD template.</i> <i>A line diagram indicating the location of main and check meters is included.</i> <i>RMP is revised to include calibration interval as annual.</i> <i>Organisation structure indicating the roles and responsibilities is included.</i>					
Documentation Provided as Evidence by Project Participant:					
<i>Proposed RMP dated 25/04/2012</i>					
Information Verified by Lead Assessor:					
Proposed RMP is checked for appropriateness of incorporation of above mentioned queries					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 25/04/2012	
Proposed RMP is now submitted in registered PDD template along with inclusion of line diagram indicating location of main meter and check meter and organization structure in sections D.4 and D.5 of the proposed RMP. This is found to be appropriate and it is accepted. Also calibration interval is mentioned as yearly which is found to be in line with observation made during site visit to the project activity. Thus CAR #3 is closed out.					
Acceptance and Close out by Lead Assessor:				Date: 25/04/2012	

7. Annex 3: Statement of Competence

Statement of Competence

Name: **Vikas Bankar**

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): <i>TA 1.2 Energy generation from renewable energy sources</i>	
2. Energy Distribution	x
Technical Area(s): <i>TA 2.1 Electricity distribution TA 2.2 Heat distribution</i>	
3. Energy Demand	x
Technical Area(s): <i>TA 3.1 Energy Demand</i>	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	

Technical Area(s):

Approved Member of Staff by:

Siddharth
Yadav

Date:

06/02/2012

Statement of Competence

Name: Ramkrishna Patil

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.2 Energy generation from renewable energy sources	
2. Energy Distribution	x
Technical Area(s): TA 2.1 Electricity distribution TA 2.2 Heat distribution	
3. Energy Demand	x
Technical Area(s): TA 3.1 Energy Demand	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by:

Siddharth Yadav

Date:

22/02/2012