JI VERIFICATION REPORT

- 2ND PERIODIC –

YARA MONTOIR NITRIC ACID PLANT

YARA MONTOIR N_2O ABATEMENT PROJECT

ITL PROJECT ID : FR1000213

Monitoring Period: 2011-01-01 TO 2012-01-31
(incl. both days)

Report No: 8000406303-12/156

Date: 2012-05-21

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Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***	***Date of this rev.***
	8000406303-12/156	0	2012-05-21	2012-05-21
Project:	***Title:***		***Registration date:***	***UNFCCC-No.:***
	"Yara Montoir N_2O Abatement Project"		2010-09-12	FR1000213
Project Participant(s):	***Host party:***		***Other involved parties:***	
	France		Belgium	
Applied methodology/ies:	***Title:***		***No.:***	***Scope:***
	Project specific methodology: *'Catalytic reduction of N2O at nitric acid plants'*		N/A	5
Monitoring:	***Monitoring period (MP):***		***No. of days:***	***MP No.***
	2011-01-01 to 2012-01-31 - both days included		396	2
Monitoring report:	***Title:***		***Draft version:***	***Final version:***
	"Yara Montoir N_2O Abatement Project"		2012-03-02	2012-05-17
Verification team / Technical Review and Final Approval	***Verification Team:***		***Technical review:***	***Final approval:***
	Ulrich Walter Sabine Meyer		Susanne Pasch Rainer Winter	Eric Krupp
Emission reductions: [t CO_2e]	***Verified amount***		***As per Draft MR:***	***As per PDD*** *V 06 (2010.08.10):*
	62,249		62,844	54,666 (50,387 per year)

Summary of Verification Opinion:

Yara Montoir Nitric Acid Plant has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: "Yara Montoir N_2O Abatement Project", with regard to the relevant requirements for JI (Track 1) project activities. The project reduces GHG emissions due to reduction of N_2O emissions. This verification covers the period from 2011-01-01 to 2012-01-31 (including both days).

In the course of the verification 3 Corrective Action Requests (CAR) and 4 Clarification Requests (CL) were raised and successfully closed. Furthermore 1 FAR has been raised to improve the monitoring system in the future. The verification is based on the draft monitoring report, revised monitoring report, and the monitoring plan as set out in the registered PDD, the determination report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the project design document.
- the monitoring plan is in accordance with the applied country specific methodology: Méthode pour les Projets Domestiques: "Réduction catalytique du N2O dans des usines d'acide nitrique".
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **62,249** t CO_2e

Including a deduction of 10% according to the Arrêté du 2 mars 2007.

Document information:	*Filename:*	*No. of pages:*
	FVR Yara Montoir Ver 2 2012-05-21.docx	76

Abbreviations:

AIE	**Accredited Independent Entity**
AMS	**Automated Measuring System**
CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CDM	**Clean Development Mechanism**
CL	**Clarification Request**
CO_2	**Carbon dioxide**
CO_2e	**Carbon dioxide equivalent**
DVM	**Determination and Verification Manual**
ER	**Emission Reduction**
ERU	**Emission Reduction Units**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
HnO_3	**Nitric Acid**
JI	**Joint Implementation**
MP	**Monitoring Plan**
MR	**Monitoring Report**
N_2O	**Nitrous Oxide**
PCS	**Process Control System**
PDD	**Project Design Document**
PP	**Project Participant**
QA/QC	**Quality Assurance / Quality Control**
UNFCCC	**United Nations Framework Convention on Climate Change**
XLS	**Emission Reduction Calculation Spread Sheet**

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1. INTRODUCTION

YARA Montoir NITRIC ACID PLANT (Yara France) has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 2nd periodic verification of the project

"YARA MONTOIR N_2O ABATEMENT PROJECT"

with regard to the relevant requirements for JI (Track 1) project activities. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered JI project number FR1000213[1].

GHG data for the monitoring period covering 2011-01-01 to 2012-01-31 was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Determination and Verification Manual /DVM/ of the UNFCCC.

This report summarizes the findings and conclusions of this 2nd periodic verification of the above mentioned UNFCCC registered project activity.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification of the:

- implementation and operation of the project activity as given in the PDD,
- compliance with applied approved monitoring plan,
- data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- accuracy of the monitoring equipment,
- quality of evidence,
- significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this registered project is based on the project design document /PDD/, the monitoring reports /MR/, emission reduction calculation spreadsheet /XLS/, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 6 of the Kyoto Protocol /KP/,

[1] http://ji.unfccc.int/JIITLProject/DB/TI8WEH10KLOWWD6VKENE03RDY64DVV/details

- guidelines for the implementation of Article 6 of the Kyoto Protocol as presented in the Marrakech Accords under decision 9/CMP.1 /MA/, and subsequent decisions made by the JISC and COP/MOP,
- other relevant rules, including the host country legislation,
- JI Validation and Verification Manual /DVM/,
- monitoring plan as given in the registered PDD /PDD/,
- Projet Domestique Methodology: "Catalytic reduction of N_2O at nitric acid plants " Méthode pour les Projets Domestiques: "Réduction catalytique du N2O dans des usines d'acide nitrique"

2. GHG PROJECT DESCRIPTION

2.1. Project Characteristics

Essential data of the project is presented in the following Table 2-1.

Table 2-1: Project Characteristics

Item	Data		
Project title	Yara Montoir N_2O Abatement Project		
JI Track	☒ Track 1 ☐ Track 2 ☐ JPA		
Project size	☒ Large Scale ☐ Small Scale		
JI Approach	☒ JI Specific Approach ☐ Approved CDM Methodology		
Project Scope *(according to UNFCCC sectoral scope numbers for CDM)*	☐	1	Energy Industries (renewable- /non-renewable sources)
	☐	2	Energy distribution
	☐	3	Energy demand
	☐	4	Manufacturing industries
	☒	5	Chemical industry
	☐	6	Construction
	☐	7	Transport
	☐	8	Mining/Mineral production
	☐	9	Metal production
	☐	10	Fugitive emissions from fuels (solid, oil and gas)
	☐	11	Fugitive emissions from production and consumption of halocarbons and hexafluoride
	☐	12	Solvents use
	☐	13	Waste handling and disposal
	☐	14	Land-use, land-use change and forestry
	☐	15	Agriculture
Methodology:	*Project Domestique Methodology: "Catalytic reduction of N_2O at nitric acid plants"*		
Technical Area(s):	5.1: N_2O (chemical process industries)		
ITL Project ID No.:	FR1000213		
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (2.3 y)[*)]		

[*)] Until the end of the 1st Kyoto Commitment period on 31/12/2012, in accordance with the host country LoA.

2.2. Project Verification History

Essential events since the registration of the project are presented in the following Table 2-2.

Table 2-2: Project verification history

#	Item	Time	Status
1	Date of registration	2010-09-12[2)]	-
2	Start of crediting period	2010-09-12	-
3	1st Monitoring period	2010-09-12 to 2010-12-31	Closed, ERUs were issued
4	2nd Monitoring period	2011-01-01 to 2012-01-31	Subject of this verification report

2) Date of registration is the date two month after submission of the full project documentation and request for LoA to the MEEDDM

2.3. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-3).

Table 2-3: Project Parties and project participants

Characteristic	Party	Project Participant
Host party	France	YARA France SAS YARA International ASA N.serve Environmental Services GmbH
Other Involved Party	Belgium	YARA France SAS

2.4. Project Location

The details of the project location are given in table 2-4:

Table 2-4: Project Location

No.	Project Location
Host Country:	France
Region:	Region North West, Department: Loire-Atlantique; Commune: Montoir-de-Bretagne
Project location:	Plant absorption tower and tail gas stack: 47°18'3 0.85"N, 2° 7'4.50"W Ammonia burner: 47°18'30.67"N, 2° 7'9.02"W

2.5. Technical Project Description

The project activity aims to reduce levels of N_2O emissions from the production of nitric acid with a secondary N_2O abatement technology: the project involves the installation of a secondary N_2O reduction catalyst at the nitric acid production plant. The emission reductions are a result of the catalytic decomposition of nitrous oxide. Nitrous oxide which is formed as by-product of the nitric acid production will be removed by the catalyst installed below the standard precious metal gauze pack in the ammonia burner. The nitrous oxide would otherwise be emitted as part of the tail gas of the nitric acid plant to the atmosphere.

The key parameters for the project are given in table 2-5:

Table 2-5: Technical data of the plant

Parameter	Unit	Value
2 Ammonia Oxidation Reactors		
Plant type		3 bar medium pressure plant
Manufacturer	-	Uhde/Grande Paroisse
Start of commercial production	-	February 1972
Operating conditions as per specifications (trip point values)		
- Temperature (min/max):	°C	725 - 925
- Pressure (max):	Bar	3.5
- Ammonia to Air ratio (max)	%	12.5
Ammonia Oxidation Catalyst		
Manufacturer	-	K. A Rasmussen AS
Type	-	n.a.
Composition:	-	Pt-Rh-Pd
Absorber		
Design capacity per day (100 %)	$tHNO_3/d$	1,030
Design capacity per day (legal)	$tHNO_3/d$	1,030
Annual production (design)	days/year	340
Annual production (practice)	days/year	340
Secondary Catalyst		
Start of operation	-	May 2009
Manufacturer	-	YARA
Type	-	58-Y1
Composition:	-	cobalt (ii, iii) oxide dialuminium cobalt tetraoxide Cu, Fe, Mn, Ni, Ce
Design efficiency N_2O reduction (guaranteed by supplier)	%	88-95 %
N_2O Analyzer (stack)		
Manufacturer	-	Dr. Födisch Umweltmesstechnik GmbH
Type	-	MCA 04
Measurement Principle	-	IR absorption
Stack volume flow rate measurement		
Manufacturer	-	Dr. Födisch Umweltmesstechnik GmbH
Type	-	FMD 99
Measurement Principle	-	Differential pressure

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- A desk review of the Monitoring Report /MR/ submitted by the client and additional supporting documents with the use of customised verification protocol /CPM/ according to the Determination and Verification Manual /DVM/,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 3.1 below:

Table 3.1: Verification sequence

Topic	Time
Assignment of verification	2012-03-05
On-site-visit	2012-03-13
Draft reporting finalised	2012-03-16
Final reporting finalised	2012-05-21
Technical review finalised	2012-05-21

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,

- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consistent of one team leader and 1 additional team member, was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-1 below.

Table 3-1: Involved Personnel

	Name	Company	Function [1)]	Qualification Status [2)]	Scheme competence [3)]	Technical competence [4)]	Verification competence [5)]	Host country Competence	On-site visit
☒ Mr. ☐ Ms.	Walter, Ulrich	TN CERT GmbH	TL[A)]	LA	☒	5.1	☒	☐	☒
☐ Mr. ☒ Ms.	Meyer, Sabine	TN CERT GmbH	TM[A)]	LA	☒		☒	☒	☐
☐ Mr. ☒ Ms.	Susanne Pasch	TN CERT GmbH	TR[B)]	A	☒		☒	☐	-
☒ Mr. ☐ Ms.	Rainer Winter	TN CERT GmbH	TR[B)]	SA	☒	5.1	☒	☐	-
☒ Mr. ☐ Ms.	Eric Krupp	TN CERT GmbH	FA[B)]	SA	☒		☒	☐	-

[1)] TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert
3) GHG auditor status (at least Assessor)
4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)
5) In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE
B) No team member

3.4. Publication of the Monitoring Report

In accordance with decision 9/CMP.1 (§ 36) the draft monitoring report, as received from the project participants, has been made publicly available on the TÜV NORD Website http://www.global-warming.de during a 30 days period from 2012-03-15 to 2012-04-15. Comments received are taken into account in the course of the verification, if applicable. No comments were received.

3.5. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in table 3-2 below.

Table 3-2: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)**

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)**
The following potential risks were identified and divided and structured according to the possible areas of occurrence.	*The potential risks of raw data generation have been identified in the course of the monitoring system implementation.* *The following measures were taken in order to minimize the corresponding risks.* *The following measures are implemented:*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.*	*The additional verification testing performed is described. Testing may include:* - *Sample cross checking of manual transfers of data* - *Recalculation* - *Spreadsheet 'walk throughs' to check links and equations* - *Inspection of calibration and maintenance records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

The completed table A-1 is enclosed in the annex 1 (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a JI project is expected to meet for verification
- It ensures a transparent verification process where the verifying AIE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in table 3-3.

Table 3-3: Structure of the project specific periodic verification checklist

Table A-2: Periodic verification checklist						
No.	***DVM[2] paragraph / Checklist Item*** *(incl. guidance for the determination team)*	***Initial Finding*** *(Means and results of assessment)*	***Ref.***	***Action requested to project participant*** *(CAR, CL, FAR)*	***Review of PP´s action***	***Conclusion***
Number of the checklist item	*The section gives a reference to the relevant paragraph of the DVM. The checklist items are linked to the various requirements the project should meet. The checklist is organised in various sections. Each section is then further subdivided as per the requirements of the topic and the individual project activity.*	*The section is used to elaborate and discuss the checklist item in detail. It includes the initial assessment of the verification team and how the assessment was carried out.*	*Gives reference to the information source on which the assessment is based on.*	*Assessment based on evidence provided if the criterion is not fulfilled a CAR, CL or FAR (details of each finding are elaborated in chapter 4) is raised otherwise no action is requested. The assessment refers to the draft verification stage.*	*Assessment based on the project participant action in response to the raised CAR, CL or FAR (details of each finding are elaborated in chapter 4). The assessment refers to the final verification stage.*	*Final assessment at the final verification stage is given.*

The periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in the annex (table A-2) to this report.

3.6. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

[2] JISC 19 Annex 4

- the last revision of the PDD including the monitoring plan/PDD/,
- the last revision of the determination report/DET/,
- the monitoring report, including the claimed emission reductions for the project/MR/,
- the emission reduction calculation spreadsheet/XLS/.

Other supporting documents, such as publicly available information on the UNFCCC / host country website and background information were also reviewed.

3.7. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of Nitric Acid Plant and project developer (consultant) including the operational staff of the plant were interviewed. The main topics of the interviews are summarised in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel, Yara Montoir Nitric Acid Plant	- General aspects of the project - Technical equipment and operation - Changes since validation - Calibration procedures - Quality management system

Interviewed Persons / Entities	Interview topics
	- Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring and measurement equipment - Maintenance
2. Consultant, N.serve	- Remaining issues from validation - Monitoring data management - Data uncertainty and residual risks - GHG emission reduction calculation - Procedural aspects of the verification - Environmental aspect

3.8. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings from the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

3.9. Resolution of CARs, CLs and FARs

Non-conformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

- 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 or previous verifications requiring actions by the project participants to be verified during verification have not been resolved.

The verification team uses the term Clarification Request (CL), which is be issued if:

- information is insufficient or not clear enough to determine whether the applicable JI requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. refer to chapter 4.

3.10. Final reporting

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.11. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.12. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the request for issuance can be started.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report/MR/, the calculation spreadsheet/XLS/, PDD/PDD/ and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

Table 4-1: Summary of CAR, CL and FAR

Verification topic	No. of CAR	No. of CL	No. of FAR
A – Project Approvals	0	0	0
B – Project Implementation	2	1	1
C – Monitoring Plan Compliance	1	3	0
D – Monitoring Plan Revision	0	0	0
E – Data Management	0	0	0
SUM	**3**	**4**	**1**

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

Finding:	**CAR B1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Monitoring Report: 1. The statement "3.4 bar plant" needs to be clarified. 2. The numbering of Annex 1 should follow the monitoring plan of the PDD. 3. The NAP measurement instrumentation and crosscheck procedures (mass balance and fertiliser output) shall be included in Annex 2. 4. The estimated and generated number of ERUs during the verification period shall be compared. Deviations shall be explained.		

Finding:	CAR B1
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*1. The correct pressure of the plant has now been stated in section 2 of the MR (3 bar)* *2. The order of the parameters does follow the order shown in the PDD. The slight difference in the numbering comes from the fact that the OP (operating pressure) was not listed as a parameter in the PDD (according to the methodology a parameter does not have to be monitored unless it constitutes a trip point value). However, during the first verification, the auditor asked for this parameter to be included in the monitoring report, even though it is not necessary. OP was added after OT for continuity, and thus the subsequent numbers are shifted forward.* *3. The NAP measurement instrumentation details, and frequency of calibration and maintenance, have now been included in Annex 2. The cross-check procedures have been included in P.5 of Annex 1.* *4. The estimated and generated number of ERUs during the verification period has now been compared, and deviations explained, following the table in section 7.2.*
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	1. OK, figure has been revised. 2. OK, the verification team will accept the differences in the numbering. 3. OK, necessary information regarding instrumentation and QA/QS measures were added in the Annex 2. 4. OK, the PP added a section " Predicted vs. achieved ERUs" in the MR. The realised emission reductions nearly meet the estimated ones. A little increase is due to improvements in catalyst basket system and plausible.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	FAR B2		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The number of ERUs of the whole monitoring period must not exceed the maximum value (cap) of 117.571 kg $N_2O/tHNO_3$ (after 10% deduction) stated in the French LoA.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*			

Finding:	FAR B2
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding:	CL B3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The number of ERUs of the whole monitoring period must not exceed the maximum value (cap) of 117.571 kg $N_2O/tHNO_3$ (after 10% deduction) stated in the French LoA.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The PP provided relevant info to access the total amount of ERUs		
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	OK. It could be shown, that the generated ERUs do not exceed the LoA cap. The assessment is included in Chapter/Table 5.7 of this report.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	CAR B4		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	TR-findings Monitoring report: **PDD/MR:** 1. p.4/p.6: The operating pressure is not consistent. 2. p.11: NCSG/VSG: Is the unit Nm^3 or m^3? 3. p.12: The definition of ERU is not the usually used one. 4. p.18: The number of days of the Monitoring Period is not correct. Accordingly, the amount of ERUs expected according to the PDD is not correct.		

Finding:	CAR B4
	5. p.18: The total amount of ERUs claimed by the project so far is not correct. 6. p.27: Please include information on the AMS downtime in August/September in the Monitoring Report
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*1. The operating pressure on page 6 has now been changed to be consistent with the rest of the report* *2. The units for NCSG and VSG on page 11 have now been changed to Nm3* *3. The ERU definition used on page 12 has now been amended* *4. The number of days of the monitoring period stated on page 18 has now been corrected. In consequence the amount of ERUs expected according to the PDD has also been changed.* *5. The total amount of ERUs claimed by the project so far (page 18) has been corrected.* 6. *Information on the downtime of the VSG flow meter for part of August and September has now been included on page 27.*
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	1. OK. Correction were made 2. OK. $Nm^3$are now included 3. OK. ERU definition is now as per methodology 4. OK. Number of days are now 396 and correct 5. OK. Total amount of ERUs are now correctly stated 6. OK. The reason for downtime is now included in the monitoring report
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	CAR C1

Finding:	CAR C1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	AMS-data processing: 1. Moisture correction shall be applied on the NCSG-raw data. 2. The correct inner stack diameter (0.994 m acc. to the provided technical drawing) shall be used for calculation of VSG.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*1. According to the parameter settings in the MCA 04 analyzer, the N2O data was measured and reported in wet conditions. The moisture content in the tail gas is also measured by the MCA 04. The reported data was used to recalculate the N2O data to dry conditions. The corrected data has now been used in the ER calculation.* *2. The cross section of the stack was wrongly set in the parameters of the stack gas flow meter as 0.7697 m² (based on an inner diameter of 0.99 m. However it was noted during the verification that the correct inner diameter is 0,994 m and the cross section is therefore 0.776 m². The results for stack gas flow were recalculated based on the correct stack diameter.*		
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	1. OK,. The revised XLS-sheet now includes a correction of measured NCSG-values with measured moisture data (i.e.: =I6/(1-S6/100)). The moisture correction is correctly applied. 2. OK. The ER-calculation no take into account following correction: This leads to higher VSG-values according to following formula: ='Raw data '!M6*$T$46/$T$45 (sample)		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

	Diameter	Area
	m	m²
Stack diameter wrong	0,99	0,7697
Stack diameter corrtect	0,994	0,7760

Finding:	CL C2		
Classification	☐ CAR	☒ CL	☐ FAR

Finding:	CL C2
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The maintenance protocol of Foedisch Umweltmesstechnik AG dated 2011-02-02 mentions a changing of the settings of the differential pressure transmitter of the AMS from 0-15 to 0-30 mbar because some measured values exceed the measuring range. It should be clarified if there is any effect on the calculation of normalised data.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*During periods of maximum operational load of the nitric acid plant it was noted that the differential pressure measurement sometimes comes close to the upper range of the differential pressure measurement transmitter (14.9 – 15.1 mbar). Therefore a higher range was chosen and implemented in order to avoid the possibility of exceeding the range. If the range were to be exceeded, the status signal of the flow meter would indicate an error. Such results would be replaced by the conservatively calculated default value. For the period before the change of the range (01/01/2011 – 02/02/2011) no such periods were observed.*
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	OK. The changing of settings of the measurement of differential pressure is related to internal data processing inside the Foedisch FMD 99 device and has no influence on the DSC data storage or calculation of monitoring parameter data. Therefore there would be no influences on the data normalisation. Remark: The meaning of "default value" is substitution value according to additional explanations from the PP and therefore according to the methodology.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	CL C3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In the period from 2011-06-21 to 2011-07-21 the densimeter for Nitric acid measurement was out of operation. The PP used as substitution value a fixed concentration value (57.8%). Please give a justification of this value.		

Finding:	CL C3
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The PPs have now explained in section 7.1.1 that the plant staff used a fixed value of 57.8% to calculate the nitric acid production during this period, which is the average concentration taken from all the readings recorded manually by the plant staff at each shift (a total of 194 readings). The excel sheet with these values has been provided to TÜV Nord.*
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	OK. The PP provided an XLS-sheet (Shift NAP concentration Montoir 21.06 to 21.07 2011)/NAP-XLS/ which gives sufficient information to confirm this approach.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	CL C4		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	TR-findings ERU-calculation **Excel sheet:** 1. Tab Calculations, column V-Y: Please clarify if the values are given in Nm³ or m³. 2. The application of the substitute value of 57.8% for the HNO_3 concentration (2011-06-21 to 2011-07-21) is not transparent in the excel sheet. 3. Why is it appropriate calculating the substitute value of NCSG including hours of plant downtime, but the substitute value of VSG excluding hours of plant downtime		

Finding:	CL C4
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*1. In the EXCEL calculation sheet the folder "ERU Calculation" summarizes all steps of the calculation according to the PDD. The units of the different data columns are shown in line 55. Data in Columns V and W is given as m³/h, data in columns X and Y is given in °C. The conversion of the stack gas flow to standard conditions (Nm³/h) is done in column G* *2. The conversion of the amount of produces nitric acid to 100 % concentration is done in the DCS system. Therefore the substitute value is applied there. From the DCS system the NAP results are reported as 100% concentrated nitric acid. No further conversion is done in the EXCEL calculation sheet.* *3. The substitute value for NCSG is calculated in column Q. Basis for this calculation are all NCSG hourly results when the plant is in operation and the NCSG analyser is in operation. The substitute value for VSG is calculated in column U. Basis for this calculation are all VSG hourly results when the plant is in operation and the VSG analyser is in operation. Therefore there is no difference in the approach for calculating the substitute value.*
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	1 – 3: The PP provided sufficient explanations to clarify the requests on data management and calculation completely.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CRs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Implementation of the project

During the verification a site visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipments, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the registered PDD.

5.2. Project history

There are no open FARs from the 1st verification, all non periodic FARs of the determination process were closed in the first verification/VR1/.

5.3. Special events

Date	Event
Feb/Mar	
2011-02-01	Maintenance of analysers by Foedisch
2011-02-02	Maintenance of flow meter by Foedisch
2011-02-02 to 2011-03-21	Problems with gas volume flow meter
Apr/May	
2011-04-28 to 2011-05-17	Annual plant shutdown
Jun/Jul	
2011-06-07 to 2011-06-08	Unscheduled plant stop
2011-06-21 to 2011-07-21	Problems with HNO_3 flow meter
Nov/Dec	
2011-11-28 to 2011-12-20	Unscheduled plant stop
Jan 2012	
2012-01-24 to 2012-01-26	Unscheduled plant stop

Table 5.3.: Special events

5.4. Compliance with the monitoring plan

The monitoring system and all applied procedures are mainly in compliance to the registered monitoring plan. The verification team found some minor inconsistencies which caused a finding.

Parameter	Measurement device	QA/QS-Measures	
		Last	Next
N_2O-mass flow	Dr. Födisch MCA 04/AST/	Calibration: 2011-09-07 (AST) QAL3: monthly/ML/	Calibration: Following year (AST) Subsequent month
NAP [t HNO_3]	FOXBORO IMT 25	Calibration: regular cross-check with plant in-/output Last maintenance: 2011-05-10	Following month
Calibration gas: 160 ppm N_2O (low) 800 ppm N_2O (high)	 Bottle No: 201113230 /BOTTLE/ Bottle No.: 580696 /BOTTLE/	 Opened: N/A N/A	 Valid: Until 2012-08-04 Until 2012-11-26

Table 5.4.: QA/QS-measures

5.5. Monitoring parameters

During the verification all relevant monitoring parameters (as listed in the PDD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

Parameter:	Unit:	Applied value:
$NCSG_n$	[mg N_2O/Nm^3]	

Parameter:	Unit:	Applied value:
	169.18	average
	137.45	lower limit of confidence interval
	208.41	upper limit of confidence interval
VSG_n	[Nm³/h]	
	114,191	mean
	91,847	lower limit of confidence interval
	133,239	upper limit of confidence interval

Table 5.5.1: Upper/Lower limits and mean value of NCSG and VSG according to statistical analysis applied for ER-calculation

Parameter:	Unit:	Applied value:
OH_n	[h]	8,418
NAP_n	[$tHNO_3$]	321,455
OT	[°C]	Not applicable
AIFR	[%]	Not applicable
TSG	[°C]	Not applicable
PSG	[Pa]	Not applicable
EF_{reg}	[$kgN_2O/tHNO_3$]	1.20 kg $N_2O/tHNO_3$ for the whole monitoring period.
EF_n	[$kgN_2O/tHNO_3$]	0.50592 According to formula: $EF_n = (PE_n / NAP_n)$
PE_n	[kgN_2O]	162,629.73

Table 5.5.2: Monitored plant parameter/results of ER calculation

5.6. Monitoring report

A draft monitoring report was submitted to the verification team by the project participants. The verification team has made this report publicly available prior to the start of the verification activities. No comments were received.

During the verification, needs for clarifications were identified. The PP has carried out the requested corrections so that it can be confirmed that the monitoring report is complete and transparent and in accordance with the registered PDD and other relevant requirements.

5.7. ER Calculation

The calculation of the emission reduction is based on hourly averages data or parameters retrieved from the data processing unit.

A statistical evaluation of raw data (hourly averages) was applied for calculating campaign specific emissions:

- For all N_2O data sets a plausibility check was conducted. All data sets containing values that are implausible were eliminated.
- Calculation of the sample mean (x);
- Calculation of the sample standard deviation(s);
- Calculation of the 95% confidence interval (equal to 1.96 times the standard deviation);
- Elimination of all data that lie outside the 95% confidence interval;
- Calculation of the new sample mean from the remaining values.

Parameter	Value	Unit
NAP Nitric Acid Production (100% concentrate)	321,455	$tHNO_3$
PE Project Emissions	162,629.73	tCO_2e
Increasing of PE in case the overall uncertainty of the monitoring equipment is higher than 7,5 %/METH/: Permitted uncertainty: 7,5 % Uncertainty acc. to QAL2/QAL2/ - lower range (0 - 200ppm): 2.93 % - upper range (to 1000ppm): 3.43% Increase: none	N/A	%
EF Emission Factor	0.50592	$kgN_2O/tHNO_3$
Governmental ERU deduction	10	%
Emission Reductions (this 2nd period)	62,249	tCO_2e

Parameter	Value	Unit
Emission Reduction (1st period)	21,653	tCO_2e
Sum of emission reduction generated	83,902	tCO2e
LoA-cap/LOA/ (with deduction)	117,571	tCO_2e
Max. emission reduction below cap	Yes	

Table 5.7: Data for ER-calculation

5.8. Quality Management

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this JI project activity have been defined. The procedures defined can be assessed as appropriate for the purpose.

5.9. Overall Aspects of the Verification

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installations of the plant which are relevant for the project performance and the monitoring activities.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are not compliant with the UNFCCC / host country criteria and relevant guidance provided by the COP/CMP and the JISC (clarifications and/or guidance).

5.10. Hints for next periodic Verification

FAR B 2:
The number of ERUs of the whole monitoring period must not exceed the maximum value (cap) of 117.571 kg $N_2O/tHNO_3$ (after 10% deduction) stated in the French LoA.

6. VERIFICATION OPINION

Yara Montoir Nitric Acid Plant has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: "*YARA MONTOIR N_2O ABATEMENT PROJECT*", with regard to the relevant requirements for JI project activities. The project reduces GHG emissions due to the reduction of N_2O emissions from the production of nitric acid with secondary N_2O abatement technology (secondary catalyst). This verification covers the period from 2011-01-01 to 2012-01-31 (including both days).

In the course of the verification 3 Corrective Action Requests (CAR) and 4 Clarification Requests (CL) were raised and successfully closed. Furthermore 1 FAR has been raised. The verification is based on the draft monitoring report, revised monitoring report, and the monitoring plan as set out in the registered PDD, the determination report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the project design document.
- the monitoring plan is in accordance with the applied country specific methodology: Méthode pour les Projets Domestiques: "Réduction catalytique du N2O dans des usines d'acide nitrique".
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **62,249** t CO_2e

Essen, 2012-05-21	Essen, 2012-05-21
Ulrich Walter	Eric Krupp
TÜV NORD JI/CDM CP	TÜV NORD JI/CDM CP
Verification Team Leader	Final Approval

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
/APP/	Application for approval of a first track JI project activity.
/ARRETEL/	Letter concerning 'Arrêté Préfectoral' issued by the Prefecture de Loire - Atlantique on 2010-03-31 regarding max. Emission from Nitric Acid plant. (Regulatory Emissions factor according to the 'arrêté préféctoral' issued by the Préfet de la Loire-Atlantique in 2003 and applicable from 01/09/2005 (1.2 $kgN_2O/tHNO_3$)).
/ARRETE/	'Arrêté préféctoral' issued by the Préfet de la Loire-Atlantique in 2003 regarding max. Emission from Nitric Acid plant (Yara Montoir, applicable from 2005-09-01 (1.2 $kgN_2O/tHNO_3$).
/AST/	Annual Surveillance Tests (AST) performed by Müller-BBM on 2011-09-07, Report No. M95 281/1.
/BOTTLE/	Test gas bottles (N_2O) supplied by Messer Griesheim and stored at the lab-hood on the plant: • Bottle No: 201113230 160 ppm valid: 2012-08-04 • Bottle No.: 580696 800 ppm valid: 2012-11-26
/CERT/	ISO 9001:2000 and ISO 14001:2004 Certificates, issued by DNV, dated 2010-01-13, valid until 2013-01-03 (Certificate No. 70529-2010-AQFRA).
/CUSUM/	Cusum Control Sheet acc. DIN EN 14181 regarding drift of AMS.
/DRAW/	Technical drawing of stack including outer diameter and steel thickness of walling.
/FG/	Announcement in the German Federal Gazette regarding the suitability of the AMS Dr. Foedisch MCA 04.
/FLOWS/	Flow-sheet of nitric acid process.
/FOED-	Documents issued by AMS-Service-company Dr. Foedisch

Reference	Document
MAIN/	Umweltmesstechnik GmbH: • Maintenance Protocol Remote Maintenance, dated 2011-09-26 • Assembly-, Maintenance and Service-Protocol Nr. 0009, dated 2011-02-02 (proof of work) • Maintenance Protocol dated 2011-02-02
/NAP-XLS/	Shift NAP concentration Montoir 21.06 to 21.07 2011: List od Nitric Acid production figures to implement a substitution value
/LOA/	• LoA (host country) issued by the French "Ministère de l'Écologie, de l'Énergie, du Développement Durable et de la Mer, en charge des Technologies vertes et des Négociations sur le climat" on 2010-12-30, Ref.-No.: 100010022280. • LoA issued by the Belgian Designated Focal Point (DFP), National Climate Commission of Belgium on 2011-04-04, DFP Ref-No.: NKC/FP/6.
/LOG/	Parameterisation log of the AMS (VSG-data), provided by Foedisch, dated 2011-03-11
/MR/	1. Monitoring report of GHGs emission reductions (2011-01-01 – 2012-01-31) "Yara Montoir N_2O Abatement project" dated 2012-03-02, Ver. 01, issued by N.serve. 2. Final Monitoring report of GHGs emission reductions (2011-01-01 – 2012-01-31) "Yara Montoir N_2O Abatement project" dated 2012-05-17, Ver. 03, issued by N.serve.
/PARA-N2O/	Parameter configuration of the PHD Honeywell system, plot.
/PLOT/	Plot of NAP in verification period. Plot of N_2O-Concentrations in verification period (Source: XLS).
/QAL1A/	QAL1 Certificate 0000025929 dated 2010-03-10 regarding suitability of the AMS MCA 04 according to DIN EN 14181:2004 issued by TÜV Rheinland. QAL1 Certificate 0000025929_1 dated 2010-08-02 regarding suitability of the AMS MCA 04 according to DIN EN 14181:2004 issued by TÜV Rheinland. (i.a. with extended calibration periods: 3 months).
/QAL1V/	QAL1 Certificate No: 936/808005/C 2000-04-10 regarding FMD 99

Reference	Document
	Volumeter, English, issued by TÜV Rheinland. QAL1 Certificate No: 936/808005/C 2000-04-10 regarding FMD 99 Volumeter, German.
/QAL2CALIB/	Report on performance tests and calibration of the AMS according to EN 14181, Report No. M82 450/2 and M82 450/4, issued by Müller BBM (28 to 30/09/2009).
/QPROCE/	Etalonnage et verification de l'analysateur Cheminée (Quality procedures and instrument verification: "Procedure for calibration and management of maintenance of AMS), No.: HAE-043831, dated 2011-02-25, Ver. 00.
/QPROCI/	Quality document: Internal Instruction: Gestion du systéme automatique de mesure (AMS) dans le cadre du project de réduction des émissions de N2O (Management of the AMS in the context of the project activity), No.: HAE-043829, dated 2012-03-12 Rev-00-A • Including data management and data storage in the Honeywell-server
/QPROCMP/	Quality document: Internal instruction: Contróle visuel sur site de analyseur cheminée 05AT4901 de l'atelier Nitrique (Check of displayed information of strategies in case of failure), No.: HAE-043830, Ver. 00, dated 2011-02-25.
/VR1/	Verification report of the first period, issued by TÜV NORD CERT GmbH on 2011-07-15, No.: 8000392246-11/019
/XLS/	ERU Excel calculation spreadsheet • Calc_N02_V01_YARA_Montoir_20120221_MS • Calc_N02_V02_YARA_Montoir_20120416_MS (final version)

Table 7-2: Background investigation and assessment documents

Reference	Document
/14181/	European Standard DIN EN 14181: "Stationary source emissions –

Reference	Document
	Quality assurance of automated measuring systems
/AM0034/	Approved baseline and monitoring methodology AM0034: "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants", version 3.4
/AR/	Arrêté du 2 mars 2007 of the 'Ministère de l'écologie et du développement durable (Implementation of the JI-Guidelines in France)
/BACK/	Background paper: "N_2O EMISSIONS FROM ADIPIC ACID AND NITRIC ACID PRODUCTION", Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories issued by the NGGIP
/BELGIUM/	Rules established by the National Climate Commission for the submission of an application for approval for a project activity…
/BREF/	Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals - Ammonia, Acids and Fertilisers
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/DET/	Determination Report of the JI track 1 project: Yara Montoir N2O Abatement Project, Report No.: 600500307, dated 2011-01-18, issued by TÜV Sued.
/DVM/	JI Determination and Verification Manual
/GUIDE/	Guidance: Developing a CDM or JI project to reduce greenhouse gas emissions, issued by the: • French Ministry for Economy, Industry and Employment • French Ministry for Ecology, Energy, Sustainable Development and Town and Country Planning • French Global Environment Facility
/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book

Reference	Document
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/METH/	Méthode pour les Projets Domestiques Réduction catalytique du N_2O dans des usines d'acide nitrique (Projet Domestique Methodology: Catalytic reduction of N_2O at nitric acid plants)
/METHE/	Projet Domestique Methodology Catalytic reduction of N_2O at nitric acid plants (Translation of /METH/)
/PDD/	Project Design Document Version 06 dated 10.08.2010 "YARA Montoir N_2O abatement project"
/SAFE/	Safety data sheet, YARA N2O Abatement Catalyst 58-Y1, 58-Y1-S in accordance with EU REACH regulation

Table 7-3: Websites used

Reference	Link	Organisation
/belgium/	http://www.cnc-nkc.be/KLIMAATPLAN/EN/Home/Focalpoint/Approval NCC/	Website of the Belgian DFP
/bref/	http://eippcb.jrc.ec.europa.eu/reference/	Website of the European Commission, Joint Research Centre, Institute for Prospective Technological Studies (Provision of BAT-Reference documents)
/dehst/	http://www.dehst.de	German Emissions Trading Authority (DEHSt) at the Federal Environment Agency
/dfp/	http://www.developpement-	Ministère de l'Écologie, de l'Énergie, du

Reference	Link	Organisation
	durable.gouv.fr/	Développement Durable et de la Mer, en charge des Technologies vertes et des Négociations sur le climat
/douane/	http://www.douane.gouv.fr/data/file/6146.pdf	Web-file regarding N_2O emission taxation.
/gw/	http://www.global-warming.de/	TÜV Nord platform hosting projects open for comments at the determination stage
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/lf/	http://www.legifrance.gouv.fr/	Site of the Legifrance (La service public de la diffusion du droit)
/mist/	http://www.ecologie.gouv.fr/Methodologies-de-projets.html	Ministère de l'Écologie, de l'Énergie, du Développement durable et de la Mer (Ministry of ecology and sustainable development)
/nfg/	http://www.effet-de-serre.gouv.fr/accueil	Mission interministérielle sur l'effet de serre (French Inter-Ministry Mission on the Greenhouse Effect)
/qal1/	http://qal1.de/de/hersteller/foedisch.htm	www-database of federal environment agency for QAL 1certified AMS
/unfccc/	http://ji.unfccc.int	JI-FC

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	J. Manuel Lizon	Yara Montoir Nitric Acid Plant (Production Manager)
/IM01/	V	☒ Mr.	Marc Gres	Yara Montoir Nitric Acid Plant

Reference	MoI[1]		Name	Organisation / Function
		☐ Ms		(Process Manager)
/IM01/	V	☒ Mr. ☐ Ms.	Denis Barthouet	Yara Montoir Nitric Acid Plant (Maintenance Manager)
/IM02/	V	☐ Mr. ☒ Ms.	Rebecca Cardani-Strange	N.serve (Project Manager)
/IM02/	V	☒ Mr. ☐ Ms.	Martin Stilkenbäumer	N.serve (Monitoring Expert)

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

A1: Verification Protocol

ANNEX 1: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Raw data generation				
• Installation of measuring equipment • Dysfunction of installed equipment • Maloperation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy • Change of	• Installation of modern and state of the art equipment • Process control automation • Internal data review • Regular visual inspect-ions of installed equip-ment • Only skilled and trained personnel operates the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment	• Inadequate installation / operation of the monitoring equipment • Inadequate exchange of equipment • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures	• Site – visit (maintenance dept., gas supplier) • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees • Check of calibration records, if applicable • Check of maintenance records • Counter-check of raw data and commercial data • Check of JI manage-ment system	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
technology • Accuracy of values supplied by Third Parties	• Stand-by duty is organized • Training • Internal audit procedures • Internal check of QA/QC measures of involved Third Parties	• Insufficient accuracy • Inappropriate QA/QC measures of Third Parties	• Check of JI related procedures • Application of JI management system procedures • Check of trainings • Check of responsibilities • Check of QA/QC documentation / evidences of involved Third Parties	
Raw data collection and data aggregation				
• Wrong data transfer from raw data to daily and monthly aggregated reporting forms • IT Systems • Spread sheet programming • Manual data transmission	• Cross-check of data • Plausibility checks of various parameters. • Appropriate archiving system • Clear allocation of responsibilities • Application of JI Management system procedures	• Unintended usage of old data that has been revised • Incomplete documentation • Ex-post corrections of records • Ambiguous sources of information • Non-application of management system procedures	• Check of data aggregation steps • Counter-calculation • Data integrity checks by means of graphical data analysis and calculation of specific performance figures • Check of management system certification	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Data protection • Responsibilities	• Usage of standard software solutions (Spreadsheets) • Limited access to IT systems • Data protection procedures	• Manual data transfer mistakes • Unintended change of spread sheet programming or data base entries • Problems caused by updating/upgrading or change of applied software	• Check of data archiving system • Check of application of Management system procedures	
Other calculation parameters				
• Emission factors, oxidation factors, coefficients	• The values and data sources applied are defined in the PDD and monitoring plan	• Unintended or intended Modification of calculation parameters • Wrong application of values • Misinterpretations of the applied methodology and/ or the PDD • Missing update of applicable regulatory framework (e.g. IPCC values)	• Update-check of regulatory framework • Countercheck of the applied MP in the MR against the approved version	• **See Table A-2**
Calculation Methods				

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Applied formulae • Miscalculation • Mistakes in spread-sheet calculation	• Advanced calculation and reporting tools • A JI coordinator is in charge of the JI related calculations • Usage of tested / counterchecked Excel spreadsheets • Involvement of external consultants	• The danger of miscal-culation can only be minimized.	• Countercheck on the basis of own calculation. • Spread sheet walk-trough. • Plausibility checks • Check of plots	• **See Table A-2**
Monitoring reporting				
• Data transfer to the author of the monitoring report • Data transfer to the monitoring report • Unintended use of outdated versions	• An experienced JI consultant is responsible for monitoring reporting. • JI QMS procedures are defined	• The danger of data transfer mistakes can only be minimized • Inappropriate application of QMS procedures	• Counter check with evidences provided. • Audit of procedure application	• **See Table A-2**

Table A-2: (Project specific) Periodic Verification Checklist

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
A	***Project Approvals by Parties involved***					
A.1	*DVM § 90* Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	*Description:* • The report will be submitted directly to the DFP by the PP because it is a track 1 project. • Written approvals from host and investor countries are available in the project database on the DFP- and UNFCCC-webpage. *Means of determination:* DFP-website, LoA, Unfccc-website, MR *Conclusion:* Criteria is fulfilled	/LOA/ /dfp/ /unfccc/			OK
A.2	*DVM § 91* Are all the written project approvals by Parties involved unconditional?	*Description:* The French LoA has two conditions, which need to be taken into account: • Only 90 % of the verified emission reductions of one period shall be claimed by the PP. The ERU quantity stated in this report already takes into account the 10% deduction.	/ARRET / /ARRET L/ /METH/	FAR B2 CL B3	~~CL B3~~ Pls. see Chapter 4	FAR B2

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No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		• The total amount of verified emission reductions until 2012-12-31 is limited to 130,634 tonnes CO_2e before 10 % deduction and 117.571 tonnes after deduction. • As reference scenario, the benchmark values of the methodology or maximum emission limits set by the government must be used. *Means of determination: French Method,* plant specific "Arrêté Préfectoral", LoA, PDD, MR, and XLS-spreadsheet. *Conclusion:* • The specific regulatory emission limit was taken into account in the ERU calculation. • 10 % of the emission reductions are subtracted from the initial result. The ERU quantity stated in this report already takes into account the 10% deduction. • The sum of emission reduction does not exceed the maximum. **CL B3 (also FAR B2 of the next verification):** The number of ERUs of the whole monitoring period must not exceed the maximum value (cap) of 117.571 kg $N_2O/tHNO_3$ (after 10% deduction) stated in the French LoA. Remark:	/LOA/ /PDD/ /XLS/ /MR/ /dfp/ /unfccc/ /AP/ /VR1/			

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		The applicable benchmark value set by the French government is higher than the emission level set by the local government (specific regulatory Emissions Factor according to plant specific "Arrêté Préfectoral").				
B	***Project implementation***					
B.1	*DVM § 92* Has the project been imple-mented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	*Description:* The project installations (Abatement catalyst, AMS) were checked by the verification team and compared with the description given in the registered PDD. The installation of the abatement catalyst and monitoring system is in line with the PDD. The plant envisages improving the catalyst basket inside the ammonia burner in 2012 to reduce bypass flow of process gas. *Means of determination:* Interviews, PDD, certificates provided by the PP, on-site visit *Conclusion:* The verification team has checked during the onsite visit the project implementation and can confirm that the project runs according to the PDD. Documentation of inspection, calibration, verification, (preventive) maintenance and malfunction is implemented in the QM system as electronic control cards (SAP)/QA.../ The Dr. Födisch MCA 04 Gas Analyzer and FMD 99 stack	/IM01/ /IM02/ /PDD/ /QAL1A/ /QAL1V/ /QAL2 CALIB/ /QAL2INST/ /MR/ /14181/ /AST/ /QPRO CMP/			OK

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		gas flow meter, both have QAL1 approval as specified by EN ISO 14956. According to EN 14181 the most recent QAL2 test was conducted by the service company Müller-BBM in 2009 and the Annual Surveillance Tests (AST) was performed by Müller-BBM in 2011 and is still valid. A new AST must be carried out in 2012.	/QPROCI/ /QPROCE/ /DRAW/			
B.2	*DVM § 93* What is the status of operation of the project during the monitoring period?	*Description:* The project is running according to the description provided in the PDD. *Means of determination:* Calculation sheets annexed to the monitoring report, PDD, interviews, on-site visit and inspection of implementations. *Conclusion:* The project is in accordance to the description provided in the PDD and every other stipulation or requirement mentioned in all sections of the methodology.	/IM01/ /IM02/ /PDD/ /XLS/ /MR/			OK
C	***Compliance with monitoring plan***					
C.1	*DVM § 94* Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the	*Description:* *Description:* Monitored parameter and parameter (according to the methodology and the registered PDD) used for calculation are: • $NCSG_n$ [mg N_2O/Nm^3] *Meaning:*	/PDD/ /DET/ /MR-1/ /14181/ /ARRETE/	CAR B1	~~CAR B1~~ Pls. see Chapter 4	OK

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
	UNFCCC JI website?	Average N_2O concentration in the tail gas during project Verification Period n. *Source:* Continuous emissions N_2O analyser (part of AMS) *Measurement frequency:* Hourly value based on continuous monitoring *Storage frequency:* 10 sec • VSG_n [Nm^3/h] *Meaning:* Average Volume flow rate of the tail gas during project Verification Period n. *Source:* Gas volume flow meter (part of AMS) *Measurement frequency:* Hourly value based on continuous monitoring (10 second frequency) *Storage frequency:*	/ARRETEL/			

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		10 sec • PE_n [kgN2O] *Meaning:* N_2O emissions during project Verification Period n. *Source:* Calculated from measured data *Measurement frequency:* Calculated after each Verification Period *Applied value:* Calculated according to the methodology: $PE^n = VSG_n * NCSG_n * OH_n * 10^{-6}$ • OH_n [h] *Meaning:* Total operating hours of Verification Period n. *Source:* Derived from OT (oxidation temperature determined by a thermocouple in the ammonia burner). In the case the OT will leave the range of trip points, a plant stop will be				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		forced by the PCS. *Measurement frequency:* Continuous • NAP_n [$tHNO_3$] *Meaning:* Metric tonnes of 100% concentrated nitric acid during any Verification Period n. *Source:* Nitric acid flow meter with mass flow and concentration measurements. In case of malfunction of automatic measurements the manual log of the plant shift was used *Measurement frequency:* Continuously throughout the Verification Period n. • OT [°C] *Meaning:* Oxidation temperature in the ammonia oxidation reactor (AOR). *Source:*				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		3 thermocouples inside the AOR. If two out of three are outside the trip points, the plant stops. An additional thermocouple located at the same place is used for registration of OT. If this device detects a temperature which is in the specification, the plant is considered to be in operation. *Measurement frequency:* Hourly average value based on continuous monitoring • OP [Bar] *Meaning:* Pressure inside the ammonia oxidation reactor (AOR). *Source:* Pressure probes at the AOR inlet (Ammonia/Air mixture). The trip point is 3.5 bar but the maximum possible pressure in the AOR is 3 bars according to the compressor performance. The max. Pressure measured during this period is below 3 bar. *Measurement frequency:* Hourly average value based on continuous monitoring • AFR [Nm^3NH_3/h]				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Meaning: Ammonia Flow rate to the ammonia oxidation reactor (AOR) *Source:* Continuous emissions ammonia flow meter *Measurement frequency:* Hourly average value based on continuous monitoring • AIFR [%] *Meaning:* Ammonia to air ratio into the AOR *Source:* Ammonia & Air flow meters *Measurement frequency:* Hourly average value based on continuous monitoring • TSG [°C] *Meaning:* Temperature of stack gas *Source:*				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Probe (part of the gas volume flow meter). *Measurement frequency:* Hourly average value based on continuous monitoring • PSG [Pa] *Meaning:* Pressure of stack gas *Source:* Probe (part of the gas volume flow meter). *Measurement frequency:* Hourly average value based on continuous monitoring • EF_n [$kgN_2O/tHNO_3$] *Meaning:* Emissions factor calculated for project Verification Period n. *Source:* Calculated from measured data • EF_{reg} [$kgN_2O/tHNO_3$]				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Meaning: Emissions cap for N_2O from nitric acid production set by government/local regulation. *Source:* National or local N_2O emissions legislation /AP/ In this case, the regulatory limit is lower than the applicable benchmark emissions factor, thus EF_{reg} replaces EF_{BM} in the calculation of ERUs. • EF_{BM} [$kgN_2O/tHNO_3$] *Meaning:* Specific reference value (benchmark emission factor) that will be applied to calculate the emissions reductions from a specific Verification Period (not applicable in this project). *Source:* Included in the French Methodology QA/QS: The PP refers to the project European standard 14181 regarding implementation of monitoring equipment and maintenance procedures.				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Means of determination: PDD, Monitoring report, ERU-calculation, DIN EN 14181, methodology, quality related procedures provided by the plant staff, on-site inspections and interviews with involved staff. *Conclusion:* The verification team can confirm that the monitoring of the relevant parameter implemented in the project and the referenced standards are in accordance with the monitoring plan of the final PDD. Matter of detailed checks were i.e.: • Measurement frequency • Data source • Measurement procedures • Quality procedures • Measuring points • Cross checks • Data handling, storage and processing <u>CAR B1:</u> Monitoring Report: • The numbering of Annex 1 should follow the monitoring plan of the PDD.				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
C.2	*DVM § 95a)* For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	*Description:* Project baselines are set by default values in the French methodology which was issued by the French DFP. Default values are expressed in benchmark values [kg N_2O/t HNO_3]: Year: 2010 2011 2012 Value: 2.5 2.5 1.85 For Yara Montoir Nitric acid plant the applicable benchmark value is limited lower than the nationwide benchmark emissions factors. The specific regulatory Emissions Factor according to plant specific "Arrêté Préfectoral" is: • 1.2 kgN_2O/tHNO_3. This benchmark factor resp. Emission limitation by local government are the key factors, which influences the baseline scenario and reduces the accountable emission reductions from realistic baseline emissions to the above mentioned values. The results of risk assessment are extensive measures to prevent a bypass of process gases in the catalyst bed since this will lead to a reduction of catalyst efficiency. Decreasing catalyst efficiency was identified as most important project risk *Means of determination:* plant specific "Arrêté Préfectoral", French methodology, LoA, PDD	/METH/ /LoA/ /DVM/ /AP/ /PDD/ /DVM/			OK

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Conclusion: The benchmark values are correctly considered in the calculation of baseline emissions and take into account the sectoral reform policies and legislation (point 23 (b) (i) of DVM). The verification team can confirm, that the result of risk assessment (risks associated with the project) was taken into account.				
C.3	*DVM § 95b)* Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	*Description:* Parameter and related data sources are: • $NCSG_n$ [mg N_2O/m^3] Dr. Födisch MCA 04 Continuous Emissions N_2O Analyser (part of the AMS) • VSG_n [Nm^3/h] Dr. Födisch FMD 99 gas volume flow meter (differential pressure sensor is a part of the AMS) • PE_n [kgN_2O Calculation from measured data • OH_n [h] Production Log – taking into account: plant status signal, NH_3 valve status signal, trip point parameters	/PDD/ /METH/ /PDD/ /MR-1/ /XLS/ /IM01/ /IM02/ /DRAW/ /LOG/ FOED-MAIN/	CAR B1 CAR C1 CL C2 CL C3	~~CARL B1~~ ~~CAR C1~~ ~~CL C2~~ ~~CL C3~~ Pls see Chapter 4	OK

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		• AIFR [%] Ammonia and Air flow meters • TSG [°C] Part of AMS • PSG [Pa] Part of the AMS • EF_n [$kgN_2O/tHNO_3$] For the verification period n the emission factor is: $EF_n = (PE_n / NAP_n)$ • EF_{reg} [$kgN_2O/tHNO_3$] The max. N_2O-emissions are set by the local government as: 1.2 kg for the complete monitoring period • Uncertainty of AMS (max.: 7.5 %) In case of exceeding the limit of 7.5 % overall uncertainty, the project emissions must be increased (Increase [%] =				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Established uncertainty [%] – Permitted uncertainty [7.5]) A corresponding deduction must not be applied to the calculation in this period. • NAP_n [$tHNO_3$] Nitric acid flow meter and density of nitric acid (cumulated) • GWP_{N2O} [tCO_2e/tN_2O] Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22. • ERU [ERUs (tCO_2e)] The ERU-calculation was carried out according to the formula described in the methodology: $ERU = ((EF_{BM} - EF_n)/1000 \times NAP \times GWP_{N2O}) * 0.9$ *Means of determination:* PDD, methodology, monitoring report, on-site visit of plant, PCS and data server *Conclusion:* The PP could demonstrate that data sources are mainly				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		clearly identified, reliable and transparent. The following findings were raised in this context: <u>CAR B1:</u> Monitoring Report: • The statement "3.4 bar plant" needs to be clarified. • The numbering of Annex 1 should follow the monitoring plan of the PDD. • The NAP measurement instrumentation and crosscheck procedures (mass balance and fertiliser output) shall be included in Annex 2. • The estimated and generated number of ERUs during the verification period shall be compared. Deviations shall be explained. <u>CAR C1:</u> AMS-data processing: • Moisture correction shall be applied on the NCSG-raw data. • The correct inner stack diameter (0.994 m acc. to the provided technical drawing) shall be used for calculation of VSG.				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		CL C2: The maintenance protocol of Foedisch Umweltmesstechnik AG dated 2011-02-02 mentions a changing of the settings of the differential pressure transmitter of the AMS from 0-15 to 0-30 mbar because some measured values exceed the measuring range. It should be clarified if there is any effect on the calculation of normalised data. CL C3: In the period from 2011-06-21 to 2011-07-21 the densimeter for Nitric acid measurement was out of operation. The PP used as substitution value a fixed concentration value (57.8%). Please give a justification of this value.				
C.4	*DVM § 95c)* Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	*Description:* As described under C.2., the French DFP sets emission factors as benchmark values [kg N_2O/t HNO_3]: Year: 2010 2011 2012 Value: 2.5 2.5 1.85 But the plant specific applicable benchmark value (specific regulatory Emissions Factor) at Montoir according to "Arrêté Préfectoral" is limited to a lower value of • **1.2 kgN_2O/tHNO_3.** *Means of determination:* "Arrêté Préfectoral", Methodology, Monitoring report, XLS calculation spreadsheet.	/PDD/ /METH/ /MR/ /ARETE/ /ARETEL/ /XLS/			OK

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Conclusion: The benchmark value, as set by the Prefecture de Loire-Atlantique was correctly included in the emission reduction calculation. The stack gas concentration, which correlates with the emission factor, was not mentioned in the report as required per methodology.				
C.5	*DVM § 95d)* Is the calculation of emission reductions or enhancements of net removals calculated based on conservative assumptions and the most plausible scenarios in a transparent manner?	*Description:* The transparent calculation of emission reduction follows the methodology described in the PDD. All data used is based on measurements, therefore no assumptions are used. The calculation includes: A deduction in baseline emission scenario to 1.2 kg N_2O/t HNO_3 (benchmark values) and a 10% reduction of the verified emission reductions. *Means of determination:* "Arrêté Préfectoral", Methodology, PDD, XLS *Conclusion:* The used methodology, data processing, implementation of the benchmark values and 10% reduction is a conservative approach.	/PDD/ /METH/ /ARETE/ /ARETEL / /MR/ /XLS/			OK
	Applicable to JI SSC projects only					
C.6	*DVM § 96* Is the relevant threshold to be	*Description:* The project is classified as large-scale project. *Means of determination:* PDD				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
	classified as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?	*Conclusion:* N/A.				
	Applicable to bundled JI SSC projects only					
C.7	*DVM § 97a)* Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
C.8	*DVM § 97b)* If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
C.9	*DVM § 98*	*Description:* N/A				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, Are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	*Means of determination:* N/A *Conclusion: N/A*				
D	***Revision of monitoring plan***					
	Applicable only if monitoring plan is revised by project participants					
D.1	*DVM § 99a)* Did the project participants provide an appropriate justification for the proposed revision?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
D.2	*DVM § 99b)* Does the proposed revision improve the accuracy and/or	*Description:* N/A *Means of determination:* N/A				

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
	applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	*Conclusion: N/A*				
E	***Data management***					
E.1	*DVM § 101a)* Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	*Description:* Data collection is in accordance with the monitoring plan. The monitoring system measures continuously and stores every 10 seconds. The responsible project manager extracts hourly averages for monitored parameters and necessary plant data and sent this after plausibility check to N.serve, which is responsible for correct analysis of the delivered data and calculation of ERUs. Data collection procedures, quality control and quality assurance are implemented as follows: For all N_2O data sets a plausibility check is conducted. All data sets containing implausible values are eliminated from the calculation of the average values. Implausible values are those which are negative or clearly out of the range of "normal operating conditions". Measured values were generated by local measurement	/PDD/ /METH/ /MR/ /QPROCI/ /XLS/ /DVM/ /IM01/ /IM02/ /EN14181/ /QPRO			OK

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		and monitoring devices, stored in plant automatic data management server (Honeywell PHD data collection and storage system). During data processing, measured values were evaluated according to statistical methods. The PP chooses a monitoring standard that requires the establishment of a calibration curve according to the international standard EN14181. The correction factors derived from this calibration curve during the QAL2 audit are applied onto both VSG and NCSG-determination. • VSG: QAL2 correction factor: 0.98 • NCSG: QAL2 correction factor: 0.99 • TSG: QAL2 correction factor: 1.0 • PSG: QAL2 correction factor: 1.0 The uncertainty for N_2O mass flow measurement as calculated during the QAL2 test is 2.93 % for the lower range of the analyser (0 - 200ppm) and 3.43% for the upper range (to 1000ppm). Both values are below the permitted overall uncertainty of 7.5 %. Acc. to the methodology, downtimes of the AMS were considered as following: The hourly average was calculated based on the remaining values for the rest of the hour in	CMP/ /PARA N2O/ /QA/ /QPRO CI/ /QPRO CE/ /QAL2 CALIB/ /AST/			

No.	DVM[3] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		question. If these remaining values account for less than 50% of the hourly data for one or more parameters, then this hour was eliminated from the calculation and substitute values were used instead. *Means of determination:* Methodology, Monitoring report, on-.site visit of plant incl. control room with data server. The original data (10 second cycle and 1 hour average) as excel file extracted from the data acquisition system sent to N.serve by the plant operator were checked and compared with the ER calculations developed as per the applied methodology. Conclusion: It has been confirmed that the data collection procedures are as per the description in the determined monitoring plan. No further issues have been identified in this regard.				
E.2	*DVM § 101b)* Is the function of the monitoring equipment, including its calibration status, is in order?	*Description:* All relevant monitoring instruments incl. the AMS are included in the quality procedures which are established for proper operation of the plant. (Yara Montoir is certified to international standards ISO 9001 Quality Management Systems, ISO 14001 Environmental Management Systems, and OHSAS 18001 Occupational Health and Safety Management Systems carried out by Det Norske Veritas.) *a) AMS:*	/QAL1A/ QAL1V/ /FG/ /QAL2 CALIB/ /FOEDM AIN/			OK

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		Additional measures are related to the European Norm EN14181 (2004) "Stationary source emissions - Quality assurance of automated measuring systems": QAL 1: performance approval: the AMS is suitable for purpose and in line with the European norm. The PP provides a QAL1 Certificate 0000025929 dated 2010-03-10 according to DIN EN 14181:2004 issued by TÜV Rheinland. QAL 2: The Dr. Födisch MCA 04 Gas Analyzer and FMD 99 stack gas flow meter, both have QAL1 approval as specified by EN ISO 14956. According to EN 14181 the most recent QAL2 test was conducted by Müller-BBM on 28 to 30/09/2009 (Report No. M82 450/2 and M82 450/4), with successful approval of the AMS. AST: The Annual Surveillance Tests (AST) has been performed by Müller-BBM on 2011-09-07, Report No. M95 281/1. Next test is due in 2012. QAL 3 (ongoing operation and maintenance) *N_2O-Analyzer Zero Calibration* is conducted automatically every 24 hours. Manual calibrations are done at least once per month. Manual span calibrations are done with certified test gas at least once per month and the calibration results are all documented as part of the QAL3 documentation.	/PHD/ /QPRO CMP/ /QPRO CI/ /QPRO CI/ QPROC E/ /CERT/ /IM01/ /IM02/ /AST/			

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		The flow meter FMD 99 itself does not need to be calibrated since it is a physical device without drift. Physical inspection of the condition (assembly/maintenance and service) is checked/done by Dr. Födisch Umweltmesstechnik AG. In addition, the flow meter is checked during the QAL2 and AST tests by Müller-BBM. *b) Other monitoring installations, equipment and devices:* Operation maintenance and calibration intervals are carried out by qualified and trained staff of the instrument department according to the vendor´s specification. Activities are controlled and documented as part of an electronic overall quality assurance programme. *Conclusion:* The PP implemented a quality assurance system to prove the ongoing compliance of the AMS with the norm. The most maintenance activities are monitored and controlled as part of an electronic overall quality assurance programme.				
E.3	*DVM § 101c)* Are the evidence and records	*Description:* The nitric acid plant is equipped with a Honeywell PHD data collection and storage system (DCS), which records and stores all monitoring values for NCSG,	/XLS/ /PROCI/			OK

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	used for the monitoring maintained in a traceable manner?	VSG, TSG, PSG, as well as different status signals of the AMS and the NH_3 valve status signal from the nitric acid plant that defines whether or not the plant is in operation. All monitoring data are collected from plant on 10 second basis. A data extract of hourly mean values (excel) is reported to N.serve. *Means of determination:* The original spreadsheets created by the DCS have been checked and the functioning of DCS was checked during the on-site visit (spot-check of single hours and days). *Conclusion:* The evidences and records used for the monitoring are maintained in a traceable manner. The verifier can confirm that all data are traceable from measurement-device to ER-calculation				
E.4	*DVM § 101d)* Is the data collection and management system for the project in accordance with the monitoring plan?	*Description:* The data collection and the management system are conducted as per the description in the determined monitoring plan. The data acquisition system records the hourly average data which is sent to N.serve for the quality and plausibility check, statistical analysis and final emission reduction calculation. *Means of determination:* by means of interview with the plant operator and N.serve representatives. *Conclusion:* No further issues were found in this regard.	/PHD/ /PDD/ /MR/ /XLS/			OK

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F	***Verification regarding programmes of activities (additional elements for assessment)***					
F.1	*DVM § 102* Is any JPA that has not been added to the JI PoA not verified?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
F.2	*DVM § 103* Is the verification based on the monitoring reports of all JPAs to be verified?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
F.3	*DVM § 103* Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
F.4	*DVM § 104* Does the monitoring period not overlap with previous monitoring periods?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
F.5	*DVM § 105*	*Description:* N/A				

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	If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?	*Means of determination:* N/A *Conclusion: N/A*				
	Applicable to sample-based approach only					
F.6	*DVM § 106* *Does the sampling plan prepared by the AIE:* *(a) Describe its sample selection, taking into account that:* *(i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such as:* *− The types of JPAs;*	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				

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	− *The complexity of the applicable technologies and/or measures used;* − *The geographical location of each JPA;* − *The amounts of expected emission reductions of the JPAs being verified;* − *The number of JPAs for which emission reductions are being verified;* − *The length of monitoring periods of the JPAs being verified; and* − *The samples selected for prior verifications, if any?* *(ii) If, in its sample selection, the AIE does not identify and take into account such differences among JPAs, then (does the sampling plan) provide a*					

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	reasonable explanation and justification for not doing so? *(b) Provide a list of JPAs selected for site inspections, based on a statistically sound selection of sites for inspection in accordance with the criteria listed in (a) (i) above?*					
F.7	*DVM § 107* *Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?*	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
F.8	*DVM § 108* *Has the AIE made site inspections of at least the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root*	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				

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	of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation and justification?					
F.9	*DVM § 109* *Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)*	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
	Applicable to both sample based and non-sample based approaches					
F.10	*DVM § 110* If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				