FINAL JI VERIFICATION REPORT

- 3RD PERIOD –

GPN S.A.

GPN GRAND QUEVILLY N8 N_2O ABATEMENT PROJECT

ITL PROJECT ID : FR1000147

Monitoring Period: 2011-08-11 TO 2012-03-31
(incl. both days)

Report No: 8000407955 – 12/266

Date: 2012-09-19

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Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***	***Date of this rev.***
	8000407955 – 12/266	0	2012-09-19	2012-09-19
Project:	***Title:***		***Registration date:***	***UNFCCC-No.:***
	GPN Grand Quevilly N8 N_2O abatement project		2010-04-16	FR1000147
Project Participant(s):	***Host party:***		***Other involved parties:***	
	France		Belgium	
Applied methodology/ies:	***Title:***		***No.:***	***Scope:***
	Project specific methodology: *'Catalytic reduction of N_2O at nitric acid plants'*		N/A	5
Monitoring:	***Monitoring period (MP):***		***No. of days:***	***MP No.***
	2011-08-11 to 2012-03-31 - both days included Subperiod 3.1: 2011-08-11 – 2011-12-31 Subperiod 3.2: 2012-01-01 – 2012-03-31		234	3
Monitoring report:	***Title:***		***Draft version:***	***Final version:***
	GPN Grand Quevilly N8 N_2O abatement project		2012-05-01	2012-09-13
Verification team / Technical Review and Final Approval	***Verification Team:***		***Technical review:***	***Final approval:***
	Ulrich Walter Sabine Meyer		Rainer Winter Susanne Pasch	Martin Saalmann
Emission reductions: [t CO_{2e}]	***Verified amount***		***As per Draft MR:***	***As per PDD:***
	59,504		59,504	172.285

Summary of Verification Opinion:

GPN S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of the: "GPN Grand Quevilly N8 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 tertiary N_2O abatement technology (tertiary catalyst). This verification covers the period from 2011-08-11 to 2012-03-31 (including both days).

In the course of the verification 3 Corrective Action Requests (CAR) and 0 Clarification Requests (CL) were raised and successfully closed. Furthermore 3 FARs are 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 N_2O 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 3rd 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: **59,504 t CO2e**

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

Document information:	*Filename:*	*No. of pages:*
	FVR GPN 3rd N8.docx	74

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_{2eq}	**Carbon dioxide equivalent**
DVM	**Determination and Verification Manual**
DCS	**Data Collection System**
ER	**Emission Reduction**
ERU	**Emission Reduction Units**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
HNO_3	**Nitric Acid**
JI	**Joint Implementation**
MMD	**Measurement and Monitoring Devices**
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

GPN S.A. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 3rd periodic verification of the project

"GPN Grand Quevilly N8 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 FR1000147[1].

GHG data for the monitoring period covering 2011-08-11 to 2012-03-31 divided in

- Subperiod 3.1: 2011-08-11 – 2011-12-31,
  Regulatory limit by an *'arrêté préféctoral'* introduced by the local government /AP/ of 2.47kg $N_2O/tHNO_3$ from 2009-03-04 onwards
- Subperiod 3.2: 2012-01-01 – 2012-03-31,
  Regulation from the Ministère de l'Ecologie, de l'Environnement, du Développement Durable et de la Mer (MEEDDM) of 1.85kg $N_2O/tHNO_3$ from 2012-01-01 /METH/ onwards.

were 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 3rd 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 report /MR/, emission reduction calculation spreadsheet /XLS/,

[1] http://ji.unfccc.int/JIITLProject/DB/45O56GWFCPYVIRXJ8SVOQJ75WSOV58/details

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/,
- guidelines for the implementation of Article 6 of the Kyoto Protocol as presented in the Marrakesh 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" /METHE/ Méthode pour les Projets Domestiques: "Réduction catalytique du N_2O dans des usines d'acide nitrique"/METH/

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	GPN Grand Quevilly N8 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:	*Projet Domestique Methodology: "Catalytic reduction of N_2O at nitric acid plants"*		
Technical Area(s):	Q: 5.1		
ITL Project ID No.:	FR1000147		
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (3 y, 1 m)		

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	2010-04-16[1)]	-
2	Start of crediting period	2009-12-08	-
3	1st Monitoring period	2009-12-08 to 2010-10-31	Verified
4	2nd Monitoring period	2010-11-01 to 2011-08-10	Verified

#	Item	Time	Status
5	3rd Monitoring period • Subperiod 3.1: 2011-08-11 – 2011-12-31 • Subperiod 3.2: 2012-01-01 – 2012-03-31	2010-08-11 to 2012-03-31	Matter of this verification

1) Date of registration is the date of issuing of the LoA by the DFP

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	GPN S.A.
	France	N.serve Environmental Services GmbH
	France	Total Petrochemicals
Other Involved Party/ies (investor)	Belgium	GPN S.A.

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	North West (Haute Normandie), Département: Seine-Maritime, Commune : Le Grand Quevilly (near Rouen)
Project location address	30, rue de l'lindustrielle - BP 204 76121 Grand Quevilly Cadex
Plant Coordinates	Latitude: 49°25'2.31"N Longitude: 1°1'28.38"E

2.5. Technical Project Description

The project activity aims to reduce levels of N_2O emissions from the production of nitric acid with tertiary N_2O abatement technology (tertiary catalyst).

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

Table 2-5: Technical data of the plant N8

Parameter	Unit	Value
Ammonia Oxidation Reactor		
Manufacturer	-	ALSTOM

Parameter	Unit	Value
Diameter	mm	6198
Start of commercial production	-	July 2009
Operating conditions as per specifications (trip point values)		
- Temperature (min/max):	℃	810 – 870
- Temp. (minmin/maxmax):	℃	790 – 900 (Trip points)
- Pressure (min/max):	Bar abs	5.9 (security)
- Ammonia to Air ratio (max)	Vol.-%	10.5
Ammonia Oxidation Catalyst		
Manufacturer	-	Johnson Matthey
Composition:	-	Pt/Rd/Pd
Absorber		
Design capacity per day	t/d (100 %)	1,500
Annual production	t/year (100%)	525,000
Annual operation (design)	days	350
Tertiary Catalyst		
Manufacturer	-	GPN S.A.
Start of operation		July 2009
Type		Pelleted tertiary catalyst
Composition		Iron Zeolite
Design efficiency N_2O reduction	%	>95
Design efficiency NO_x reduction	%	>80
Capacities of substituted plants		
Oissel	t/a (metric)	297,500
N5	t/a (metric)	119,000
N6	t/a (metric)	119,000
N_2O Analyzer (stack)		
Manufacturer	-	FT Fine Tech
Type	-	ANAFIN 5000 ORBITAL AIT
Measurement Principle	-	FTIR spectrometry
Stack volume flow rate measurement		
Manufacturer	-	Sick Maihak GmbH
Type	-	FLOWSICK 100
Measurement Principle	-	Ultrasonic

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 3.0 below:

Table 3.0: Verification sequence

Topic	Time
Assignment of verification	2012-04-02
On-site-visit	From 2012-05-10 till 2012-05-11
Draft reporting finalised	2012-05-16
Final reporting finalised	2012-09-19
Technical review finalised	2012-09-19

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 2 additional team members, 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.	Ulrich Walter	TN CERT GmbH	TM[A)]	LA	☒	5.1	☒	☐	☒
☐ Mr. ☒ Ms.	Sabine Meyer	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.	Martin Saalmann	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 www.global-warming.de during a 30 days period from 2012-05-10 to 2012-06-10. 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*)**
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*	*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*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

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*)**
	implemented:		*records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	

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.

The auditor Ulrich Walter attended the site visit.

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 GPN N8 Nitric Acid Plant and N.serve 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, GPN N8 Nitric Acid Plant	- General aspects of the project - Technical equipment and operation - Changes since validation

Interviewed Persons / Entities	Interview topics
2. Consultant, N.serve	- Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring and measurement equipment - Maintenance - 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/, the Determination Report/DET/ 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	1
B – Project Implementation	1	0	1
C – Monitoring Plan Compliance	1	0	0
D – Monitoring Plan Revision	0	0	0
E – Data Management	1	0	1
SUM	**3**	**0**	**3**

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:	**FAR A1**		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The verifier of subsequent verification shall check that the sum of registered ERUs from former verifications and the ERUs of the actual period do not exceed the cap defined in the French LoA.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*			
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*			

Finding:	FAR A1
Conclusion *Tick the appropriate checkbox*	☒ To be checked during the next periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding:	B1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Monitoring report: • The distribution of the verification period has to be corrected		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The distribution of the verification period has now been corrected to show sub-period 3.1 and sub-period 3.2 throughout the whole of the monitoring report*		
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	OK. The distribution of the verification period has been corrected		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	B2		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	It must be proven at each verification, that the plant's average emission levels for the past year did not exceed the regulatory limit.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*			
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*			

Finding:	B2
Conclusion *Tick the appropriate checkbox*	☒ To be checked during the next periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding:	C1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Excel-sheet • The formula to compensate wet/dry measurement conditions of NCSG is not correct • The calculation sheet includes non relevant calculations/ contents		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*1) The formula for compensating wet/dry measurement conditions of NCSG is now corrected in the excel sheet* *2) All non-relevant calculations and comments have now been removed from the calculation sheet* *The amended ERU calculation sheet has now been provided to the AIE.*		
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	1. The formula to compensate wet/dry measurement conditions of NCSG has been corrected in the excel data sheet 2. Non-relevant calculations and comments have been removed from the calculation sheet		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	E1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	AST-report: • The pipe diameter at velocity sampling point in the actual AST report is not as per drawing 55.100-Plan 40/STACK/.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The AST report has been updated to show the correct diameter at the sampling point, which is 2.008m. The sampling was conducted in the lower third of the pipe, where the wall thickness is 12mm. The figures in the table 6.3.1 on page 22 of the report have been updated to take into account the amended diameter. The updated report has now been*		

Finding:	E1
	provided to the verifying AIE.
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and AIE assessments (#2, #3, etc.) shall be added.*	OK. The above mentioned revisions have been made. Remark: It must be mentioned that the correction of stack diameter is only an editorial issue and has no influence on mass flow calculation since calculation of volume flow is correctly done in plant DCS.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	E2		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The correspondence with raw data provided by the plant to N.serve for data processing shall be forwarded to the verification team before verification for plant N8.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*			
AIE Assessment #1 *The assessment shall encompass all open issues in annex A-2. 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 next 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

During the determination the AIE raised issues that could not be closed or resolved during the validation stage. For this purpose following FAR have been raised.

FAR A1 (FAR A1 of this report)

The verifier of subsequent verification shall check that the sum of registered ERUs from former verifications and the ERUs of the actual period do not exceed the cap defined in the French LoA.

FAR B2 (FAR B2 of this report):

It must be proven at each verification, that the plant's average emission levels for the past year did not exceed the regulatory limit.

FAR E2 (FAR E2 of this report)

The correspondence with raw data provided by the plant to N.serve for data processing shall be forwarded to the verification team before verification for plant N8.

5.3. Special events

Some events have been taken place, which influenced the N_2O-emissions from the plant and as an effect of this, catalyst performance and N_2O release to the atmosphere. The PP provided an overview of the events, which was spotchecked by the verifier/EXCEL/.

Date	

Start	Event	Reason
2011	**Detailed info has been provided to the verification team but due to confidentiality issues not been included in this report**	
12-04		
12-09		
12-26		
12-31		
2012		
01-02		
01-24 09:00 – 11:00		
02-02 10:00		
02-02 – 02-28		
02-28 – 03-03		
03-03 – 03-06		
03-16 08:00 – 17:00		

Table 5.3.: Special events

5.4. Compliance with the monitoring plan

The monitoring system and all applied QA/QC procedures are completely in compliance to the registered monitoring plan.

Parameter	Measurement device	QA/QC-Measures	
		Last	Next
N_2O	FTIR Fine Tech /AST/ See: Remark below	Calibration: 2012-01-04 (AST)	Calibration: Subsequent year (AST)*
NAP [t HNO_3]	Emerson MicroMotion CMF 300L	Calibration: 2011-09-02	Subsequent year
Calibration gas: 100 ppm N_2O	Bottle No: BX14211F /BOTTLE8/	Opened: 2012-04-18	Valid: 2014-03-31

Table 5.4.: QA/QC-measures

*not carried out at date of on site visit

Remark:

The last AST has been carried out on 2010-11-24 and was due in 2011. Since the plant was not in operation between 2011-09-11 and the end of the year, the PP was not able to carry out the annual suitability test in 2011as scheduled. After 2012-01-02 17:00 the plant was back in regular operation and the AST was successfully performed on 2012-01-04.

The "Guidelines for assessing compliance with the calibration frequency requirements"/EB52/ provides a procedure to handle with this issue. It states that in "cases where calibration is not conducted at the frequency specified by the methodology" i.a. following conservative approach shall be adopted:

a) *Applying the maximum permissible error of the instrument to the measured values , if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error*;

The maximum possible error can be understood as the uncertainty determinated during QAL2 test/QAL2/. This value of 8.5 % "*for all measured values taken during the period between the scheduled date of calibration* (2012-12-31) *and the actual date of calibration*" (para 5 of the guidelines) has been applied on the ERU calculation by the verification team.

The difference to original ERU calculation for the whole verification period is:

- 0.02 %.

The verification team believes that this difference is negligible and hence the guideline will not be applied to this special case.

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.

After appropriate corrections were carried out by the project participant in the course of this verification, 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:
$NCSG_n$	mgN_2O/Nm^3	
	76.02	mean
	0.00*	lower limit of confidence interval
	334.08	upper limit of confidence interval
VSG_n	[Nm^3/h]	

Parameter:	Unit:	Applied value:
	166,094.35	mean
	143,424.00	lower limit of confidence interval
	194,126.00	upper limit of confidence interval

Table 5.5.1.1: Upper/Lower limit and mean value of NCSG and VSG according to statistical analysis applied for ER-calculation for sub-period 3.1.

*The value is negative acc. to statistical evaluation but rounded to zero because a negative result is factual impossible.

Parameter:	Unit:	Applied value:
$NCSG_n$	mgN_2O/Nm^3	
	54.58	mean
	0.00*	lower limit of confidence interval
	204.41	upper limit of confidence interval
VSG_n	[Nm^3/h]	
	173,374.17	mean
	156,720.00	lower limit of confidence interval
	193,930.00	upper limit of confidence interval

Table 5.5.1.2: Upper/Lower limit and mean value of NCSG and VSG according to statistical analysis applied for ER-calculation for sub-period 3.2.

*The value is negative acc. to statistical evaluation but rounded to zero because a negative result is factual impossible.

Parameter:	Unit:	Applied value:
OH_n	[h]	779
NAP_n	[$tHNO_3$]	38,548
OT	[°C]	Not applicable
AIFR	[%]	Not applicable

Parameter:	Unit:	Applied value:
TSG	[°C]	Not applicable
PSG	[Pa]	Not applicable
EF_n	[$kgN_2O/tHNO_3$]	According to formula: EF_n = (PE_n/ NAP_n), the result is: 0.25772
EF_{BM}	[$kgN_2O/tHNO_3$]	2.50 kg $N_2O/tHNO_3$ (not valid in this period)
EF_{reg}	[$kgN_2O/tHNO_3$]	The max. N_2O-emissions are set by the local government as: 2.47 kg from 2009-04-04 on
PE_n	[kgN_2O]	9,934.67

Table 5.5.2.1: Monitored plant parameter/input for ER calculation for Subperiod 3.1

Parameter:	Unit:	Applied value:
OH_n	[h]	1,509
NAP_n	[$tHNO_3$]	76,985
OT	[°C]	Not applicable
AIFR	[%]	Not applicable
TSG	[°C]	Not applicable
PSG	[Pa]	Not applicable
EF_n	[$kgN_2O/tHNO_3$]	According to formula: EF_n = (PE_n/ NAP_n), the result is: 0.18732
EF_{BM}	[$kgN_2O/tHNO_3$]	1.85 kg $N_2O/tHNO_3$
PE_n	[kgN_2O]	14,420.82

Table 5.5.2.2: Monitored plant parameter/input for ER calculation for Subperiod 3.2

5.6. Monitoring report

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

During the verification, mistakes and needs for clarification 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

During the verification mistakes in the ER calculation were identified. Corresponding CARs were raised. A revised ER calculation was prepared by the PP and presented to the verification team. All raised issues were addressed appropriately so that all corresponding CARs/CLs could be closed out. Thus it is confirmed that the ER calculation is overall correct.

Relevant data for ER-calculation are:

Parameter	Value	Unit
Nitric Acid Production (100% concentrate)	115,532.7	$tHNO_3$
Project Emissions	24,355.49	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/: 8,5 % Increase: 1,0 %	1	%
Emission Factor	See tables 5.5.2.1/2	$kgN_2O/tHNO_3$
Governmental ERU deduction	10	%
Emission Reductions Subperiod 3.1	23,792	tCO_2e
Emission Reductions Subperiod 3.2	35,712	tCO_2e
Emissions Reduction this 3rd period (after deduction)	59.504	tCO_2e
Emission Reductions (2nd period)	110,747	tCO_2e
Emission Reduction (1st period)	125,810	tCO_2e

Parameter	Value	Unit
Sum of emission reductions with governmental reduction of 10%	296,061	tCO2e
LoA-cap/LOA/ (with deduction)	795.579	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 A1:

The verifier of subsequent verification shall check that the sum of registered ERUs from former verifications and the ERUs of the actual period do not exceed the cap defined in the French LoA.

FAR B2:

It must be proven at each verification, that the plant's average emission levels for the past year did not exceed the regulatory limit.

FAR E2:

The correspondence with raw data provided by the plant to N.serve for data processing shall be forwarded to the verification team before verification for plant N8.

6. VERIFICATION OPINION

GPN S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of the: "*GPN Grand Quevilly N8 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 tertiary N_2O abatement technology (tertiary catalyst). This verification covers the period from 2011-08-11 to 2012-03-31 (including both days).

In the course of the verification 3 Corrective Action Requests (CAR) and 0 Clarification Requests (CL) were raised and successfully closed. Furthermore 3 FARs are 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 N_2O 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 3rd 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: **59,504** t CO_{2e}

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

Essen, 2012-09-19	Essen, 2012-09-19
Ulrich Walter	Martin Saalmann
TÜV NORD JI/CDM CP	TÜV NORD JI/CDM CP
Verification Team Leader	Final Approval

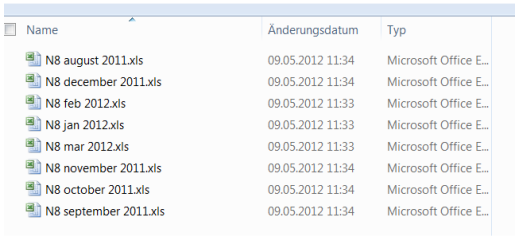
7. REFERENCES

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

Reference	Document
/**AP**/	Decree of the DRIRE (Direction Régionale de l'Industrie, de la Recherche et de l'Environnement) from 04/04/2009 setting the limits for N_2O-emissions for the N8-plant to 2.47 kg/tHNO_3.
/**APS**/	Prescriptions Complementaires (Plant permission (decree) of N5, N6, N7, N8 indicates the plant capacity of HNO_3
/**AST**/	• AST-report on performance tests and calibration of the automatic measuring system for N_2O of acid plant Line N8, No.: M87 750/2, dated 2011-03-21 • AST-report on performance tests and calibration of the automatic measuring system for N_2O of acid plant Line N8, carried out on 2012-01-04, No.: M96311/02, dated 2012-03-22
/**BILANXLS**/	BILAN HNO3 BALANCE-1_20110706.xls sheet for calculation of mass balance
/**BOOK**/	Quality document: Procedure d'Exploitation Environnement, Chapitre 07 N°02 Rejets N_2O, Consignes d'exploitation et projet domestique Rev.: 0, dated: 2010-11-25. This procedure outlines the main constraints and rules imposed on the project by legislation in relation to emissions of N_2O from the production plant of nitric acid.
/**BOTTLE8**/	Calibration gas certificate for N8 plant, all in period of validity
/**CAPN8**/	Units characteristics sheet of plant N8 showing the design capacity of Nitric Acid.
/**CAT**/	Fiche de données de sécurité (safety sheet according to GHS standard) of the abatement catalyst, issued by Yara on 2008-01-16
/**CERT**/	ISO 9001, 14001 Certificates, issued by AFNOR, valid until 2012-10-11
/**DDA**/	Demande d'Autorisation d'Exploiter (Plant permission (decree) of N8 from 15/12/2006 indicates the 100 % plant capacity of 1,500 tonnes HNO_3/year).

Reference	Document
/**DECLA**/	Declaration of emissions to local government (Effluents Gazeux-N_2O), Atelier Nitrique 8 • 2010 • 2011 • 2012
/**DN8B**/	Technical drawing of the Ammonia-Boiler of Plant N8
/**DVOLN8**/	Technical description of the HNO_3-volume flow meter of plant N 8, Micro Motion ELITE
/**EB52**/	UNFCCC EB 52, Annex 60: Guidelines for assessing compliance with the calibration frequency requirements, (Version 01)
/**FICHE**/	Fiche renseignement carte de controle –Analyseurs Nitrique, control cards for AMS
/**FICHE8**/	Fiche de vie – analysateur Nitrique 8 (Control card for N_2O-analyser of plant N8, with complete weekly calibrations noted)
/**LOA**/	Host country • LoA 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 2010-04-16, Ref-No.: 10007194 to GPN S.A. and N.serve Environmental services • LoA 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 2011-07-20, Ref-No.: 11-0756 5E DNbis to Total Petrochemicals Investor country • LoA issued by the National Climate Commission of Belgium on 2010-12-03, Ref-No.: NKC/DFP/3 to GPN S.A.
/**MANUAL**/	Procedure: Manuel Maintenance Travaux Neufs: Procedures Techniques Projet Domestique, Version No.2, 15.402.00 (Description of the organization, instructions and department procedures implemented in the framework of domestic projects), dated 2011-11
/**MR**/	• Initial and published Monitoring report of GHGs emission reductions No. 3 "GPN Grand Quevilly N8 N_2O abatement project", version 1, dated 2012-05-01 issued by N.serve. • Final Monitoring report of GHGs emission reductions No. 3 "GPN Grand Quevilly N8 N_2O abatement project", version 2, dated 2012-09-13 issued by N.serve.

Reference	Document
/**NAPFS**/	Flow Sheet of Nitric Acid Production Plant N8, Rev. 1 from 08/2007 (Doc.-No.: 1A0010-PFD-0010-0001).
/**ORGPD**/	Organisation projets domestiques (Survey of personnel organisation of the JI-project), issued by the GPN plant on 2010-11-18.
/**P&IN8**/	Pipe and Installation sheet of N8 plant.
/**PART**/	Attestation de participation (participation certificate of plant staff on maintenance work at the AMS, dated 2011-06-30
/**PROC1**/	Quality procedure: Organisation de la Cellule Analysateur pour le Suivi de analysateur securite (IPS) environment Qualité (Organisation of maintenance of the AMS), TEIN/12/300
/**PROC10**/	Projet domestique (Procedure of organisation, ENV/2/0006 domestic project), dated 2011-09-12, Rev 1 (Description of the organisation which was implemented for the domestic project between the operators, the maintenance and the environment department, extract from Environment Quality handbook SYS/1/0001
/**PROC11**/	Quality document ENV_2_0006_A3 dated 2011-09-12, Rev. 0, Check od project data (plausibility check)
/**PROC12**/	Quality document describing the mass balance procedure DTU/2/0001, dated 2011-02-11, Rev. 0
/**PROC2**/	Plan de controle suivi de analysateurs à lèmission des Nitriques N7, 8 (Plan (Procedure) of Mainenance of AMS), MEI_2_1200
/**PROC3**/	Verification des Analyseurs FTIR (Calibration procedure of the AMS (N_2O-Analysator), MEI_3_1221, Rev 4, dated 2009-11-24
/**PROC4**/	Procedure – Gestion des documents maitrises des enregistrements, (document management system), AQ/2/0001, Rev 19, dated 2011-10-03
/**PROC5**/	Programme individual de formation au poste de travail (Individual program for training on workplace), Rev 9, dated 2011-10-21
/**PROC6**/	Elaboration, execution et suivi du plan de formation (Development, Implementation and monitoring plan for training of plan staff), RH_2_0303, Rev 10, dated 2011-10-20
/**PROC7**/	Mode operatoire – Debitmetres Etalonnage verification (Procedures for calibration of HNO_3 flow meters), ELMR/3/017

Reference	Document
/PROC8/	Mode operatoire – Bilan N_2O (Quality document regarding N_2O emissions from the GPN nitric acids plants), ENV/3/1121, dated 2011-12-26, version 8
/PROC98/	Mode-operatoire – Verification des analysateurs FTIR (Quality document related to the calibration of the N_2O-analyser at N8 plant)
/QAL2CAL8/	Report on performance tests and calibration of the AMS, report No.: M82 881/1, issued by Müller BBM on 2009-12-18
/QAL2INST/	QAL2 check of correct installation of the AMS, report No.: M83 984/3, issued by Müller-BBM on 2010-08-09
/RAW-XLS/	
/SPIE CON1/	Mémoire technique et organisationnel, dated 2009-10-01 (Definition of scope of contract /CONSPIE/).
/SPIE5/	Contrat analysateurs 2010 – Annexe 5: definition des travaux de maintenance courante (Technical specification of global contract /CONSPIE/)
/SPIECON/	Contrat de maintenance (Refreshed contract between GPN and SPIE regarding maintenance of MMD equipment), dated October 2010
/STACK/	Drawing No. 55 100-Plan 40 with stack diameter (external 2032 mm, thickness of metal plates is between 8 and 12 mm)
/TRAIN/	Module 4: le System d'echantillonage (Training course for maintenance works, with staff of ESPIE and GPN, signed by the attendances)
/TRAIN2/	FineTech – Certificat d'aptitude (2 days service training for Mr. Pascal Fauquet), dated 2008-03-28
/TRAIN2/	Attestation de presence (Different certificates of participation in a training course: Maintenance of analysers, level 2 and 3)
/TRIPN8/	Tableau des securities: Nitrique 8 (List of trip point values of N8 plant)

Reference	Document
/XLS/	1. Initial version: ERU Excel calculation spreadsheet (Calc_N03_V01_GPN_N8_20120430_MS) 2. Final version: ERU Excel calculation spreadsheet (Calc_N03_V02_GPN_N8_20120627)

Table 7-2: Background investigation and assessment documents

Reference	Document
/14181/	European Standard DIN EN 14181: "Stationary source emissions – 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/	Final JI Determination Report: GPN Grand Quevilly N8 N_2O Abatement Project, Report No.: 8000373119 – 09/265, dated 2010-04-28, issued by TÜV NORD
/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

Reference	Document
/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/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 03 dated 2009-08-06 "GPN Grand Quevilly N8 N_2O abatement project"
/OTN8/	Diagram of parameter OT - Extract of ERU-calculation Excel-sheet
/NCSGN8/	Diagram of parameter NCSG - Extract of ERU-calculation Excel-sheet

Table 7-3: Websites used

Reference	Link	Organisation
/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-durable.gouv.fr/	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
/douane/	http://www.douane.gouv.fr/data/file/6146.pdf	Web-file regarding N_2O emission taxation.

Reference	Link	Organisation
/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)
/unfccc/	http://ji.unfccc.int	JI-SC

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Patrick Le Calvé	GPN N8 Nitric Acid Plant (Technical Director)
/IM01/	V	☒ Mr. ☐ Ms	Bertrand Walle	GPN N8 Nitric Acid Plant (Coordinator JI-Projects)
/IM01/	V	☐ Mr. ☒ Ms.	Isabelle Martinieau	GPN N8 Nitric Acid Plant (Quality/Environmental manager)
/IM01/	V	☒ Mr. ☐ Ms.	Pascal Fauquet	GPN N8 Nitric Acid Plant (Maintenance Engineeer)
/IM01/	V	☒ Mr. ☐ Ms.	Pierre Henri Chretien	GPN N8 Nitric Acid Plant (Plant Manager)
/IM01/	V	☐ Mr. ☒ Ms.	Rebecca Cardani-Strange	N.serve (Project manager)
/IM01/	V	☒ Mr. ☐ Ms.	Martin Stilkenbäumer	N.serve

Reference	Mol[1]		Name	Organisation / Function
				(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. The PP provided following LoA: • Host country France (PP is GPN S.A., N.serve and Total Petrochemicals) • Investor country Belgium (PP is GPN S.A.) *Means of determination:* DFP-website, LoA, Unfccc-website, MR *Conclusion:* Not all parties stated in section 2.1. of the MR are mentioned in the provided LoAs provided by the PP.	/LOA/ /dfp/ /unfccc/ /MR/			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	/LOA/ /dfp/ /unfccc/	FAR A1		

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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
		period shall be claimed by the PP. The ERU quantity stated in this report already takes into account the 10% deduction. • The total amount of verified emission reductions until 2012-12-31 is limited to 883,977 tonnes (before 10 % reduction, 795,579 tonnes after reduction) The Belgian LoA is unconditional *Means of determination:* LoA *Conclusion:* OK, • 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 AIEs does not exceed the maximum amount stated in the host LoA. FAR A1: The verifier of subsequent verification shall check that the sum of registered ERUs from former verifications and the ERUs of the actual period AIEs not exceed the CAP defined in the French LoA.				
B	***Project implementation***					
B.1	*DVM § 92*	*Description:* The PP installed a tertiary abatement catalyst	/PDD/	CAR B1	~~CAR B1~~	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
	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?	inside the DeNOx-reactor and an AMS conforming to the DIN EN 14181 before start of the project. QA/QC measures were implemented. *Means of determination:* PDD, certificates provided by the PP, on-site visit *Conclusion:* The project installations (Abatement catalyst, AMS) and procedures 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 verification team found some inconsistencies in the monitoring report, which are summarised in CAR B1. CAR B1: Monitoring report: • The distribution of the verification period has to be corrected	/QAL2 CAL7/ /AST/ /MR/ /14181/ /CAT/ /PROC 1/ - /PROC 12/ /MANUA L/		Pls. refer to section 4.	
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. Some unforeseeable events took place during verification period: The plant was shut down for several periods of time caused by damages and maintenance works/HIST8/. *Means of determination:* Calculation sheets annexed to the	/PDD/ /XLS/ /MR/ /HIST N8/			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
		monitoring report, on-site visit and inspection of implementations, plant history, PDD *Conclusion:* The project history was discussed in detail during on site visit and found to be plausible.	/DECLA/			
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 UNFCCC JI website?	*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:* 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 (10 second frequency) *Storage frequency:* 10 sec	/PDD/ /MR/ /14181/ /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
		• 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:* 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				

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
		Applied value: Calculated according to the methodology: $PE_n = (VSG_n * NCSG_n * OH_n * 10^{-6}) * 1{,}01 *$ *1.01 is the adjustment factor according to the uncertainty of the AMS of 8.5 (see C.3 and E.1) • OH_n [h] *Meaning:* Total operating hours of Verification Period n. *Source:* Derived from OT (oxidation temperature in the ammonia burner). In the case the OT will leave the range of trip points, a plant stop will be forced by the PCS. *Measurement frequency:* Continuous • NAP_n [$tHNO_3$] *Meaning:* Metric tonnes of 100% concentrated nitric acid during any Verification Period n.				

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
		Source: Nitric acid flow meter *Measurement frequency:* Continuously throughout the Verification Period n. • OT [°C] *Meaning:* Oxidation temperature in the ammonia oxidation reactor (AOR). *Source:* 3 Thermocouples inside the AOR. 3 thermocouples inside the AOR. If at least one of the temperature values is within the trip values, the plant is considered to be in operation. *Measurement frequency:* Hourly average value based on continuous monitoring • AFR [$kgNH_3/h$] *Meaning:* Ammonia Flow rate to the ammonia oxidation reactor (AOR)				

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
		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 tail gas *Source:* Probe (part of the gas volume flow meter). *Measurement frequency:*				

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
		Hourly average value based on continuous monitoring • PSG [Pa] *Meaning:* Pressure of tail 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} [$kgN_2O/tHNO_3$] *Meaning:* Emissions cap for N_2O from nitric acid production set by government/local				

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
		regulation. *Source:* National or local N_2O emissions legislation *(Decree of the DRIRE from 04/04/2009)* /AP/ If this regulatory limit is lower than the applicable benchmark emissions factor, EF_{reg} replaces EF_{BM} in the calculation of ERUs. This is the case for the period from 2011-08-11 until 2011-12-31 (Subperiod 3.1). • EF_{BM} [$kgN_2O/tHNO_3$] *Meaning:* Specific reference value (benchmark emissions factor) that will be applied to calculate the emissions reductions from a specific Verification Period. This value has been applied from 2012-01-01 on. *Source:* Included in the French Methodology QA/QC: 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. Checks details are i.e.: • Measurement frequency • Data source • Measurement procedures • Quality procedures • Measuring points • Cross checks • Data handling, storage and processing				

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:* The project baseline is set by default values of two sources: • The plant specific regulatory limit of 2.47 kg N_2O/t HNO_3 (100%), introduced by the DRIRE. • The benchmark value of 1.85 kg N_2O/t HNO_3 of the methodology from 2012 on. Following default values were used for determination the baseline scenario: Year: 2009 2010 2011 2012 Value: 2.47 2.47 2.47 1.85 EF_{BM} [kg N_2O/t HNO_3] The benchmark value is one of the key factors, which influence 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:* French methodology, LoA, interviews plant staff on GPN plant *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	/METH/ /METHE/ /DVM/ /AP/ /DECLA/	FAR B2	FAR B2	OK

		assessment (risks associated with the project) was taken into account. The verification team checked the emission declaration of the plant to the local government and found that the plant's average emission levels for the past year did not exceed the regulatory limit 2.47 kg N_2O/t HNO_3 (100%), introduced by the DRIRE. <u>FAR B2:</u> It must be proven at each verification that the plant's average emission levels for the past year did not exceed the regulatory limit. The PP provided the periodical declaration of emissions for 20011 and 2012. The verification team can confirm for this verification period that the average emission levels of the past year did not exceed the regulatory limit. The FAR is ongoing and added to the findings list for consideration in the next period				
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/Nm^3] Finetech FTIR Anafin-5000 Continuous Emissions N_2O Analyser (part of AMS) • VSG_n [Nm^3/h] Sick AG Flowsic 100 stack gas flow meter (part of AMS) • PE_n [kgN_2O] Calculation from measured data	/PDD/ /MR/ /METH/ /METHE/ /XLS/	FAR B2	FAR B2	OK

		• OH_n [h] Derived from thermocouples for OT determination and processed in PCS plant security system • NAP_n [$tHNO_3$] Coriolis flow meter Emerson MicroMotion CMF 300L • OT [°C) Thermocouple Pt 1000, Honeywell • AFR [kg NH_3/h] Endress and Hauser Deltabar S • 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: 2.47 kg until end of 2011. In this verification period this value was valid from 2011-08-11 until 2011-12-31 (Subperiod 3.1). • EF_{BM} [$kgN_2O/tHNO_3$] Specific reference value (benchmark emissions factor) that will be applied to calculate the emissions reductions from a specific Verification Period. This is the case from 2012-01-01 on (Subperiod 3.2). The applied benchmark value is 1.85 EF_{BM} [kg N_2O/t HNO_3]. • Uncertainty of AMS (max.: 7.5 %) In case of exceeding the limit of 7.5 % overall uncertainty, the project emissions must be increased (Increase [%] = Established uncertainty [%] – Permitted uncertainty [7.5]) Permitted uncertainty: 7,5 % Uncertainty acc. to QAL2[/QAL2/]: 8,5 % Increase: 1,0 % (Adjustment factor to PE_n) The ERU-calculation was carried out for each Subperiod (3.1 and 3.2) according to the formula described in the methodology: ERU = ((EF_{BM} - EF_n)/1000 x NAP x GWP_{N2O}) * 0.9 (tCO_2e) *Means of determination:* PDD, methodology, plant permits, monitoring report, on-site visit of plant, PCS and data server *Conclusion:*				

		The PP could clearly demonstrate that data sources are clearly identified, reliable and transparent and calculated according to the methodology. The verification team checked the emission declaration of the plant to the local government and found that the plant's average emission levels for the past year did not exceed the regulatory limit 2.47 kg N_2O/t HNO_3 (100%), introduced by the DRIRE. FAR B2: It must be proven at each verification, that the plant's average emission levels for the past year did not exceed the regulatory limit.				
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., two emission factors where applied for determination of maximum N_2O-emissions: • The plant specific regulatory limit of 2.47 kg N_2O/t HNO_3 (100%), introduced by the DRIRE until 2011-12-31. • The benchmark value of 1.85 kg N_2O/t HNO_3 of the methodology from 2012 on. ERUs cannot be claimed if plant emissions are exceeding the lowest of each value. *Means of determination:* Methodology, Monitoring report, arrêté préféctoral *Conclusion:* Subperiod 3.1:	/PDD/ /METH/ /MR/ /XLS/ /AP/	FAR B2	FAR B2	OK

		The maximum allowed emission factor value of 2.47 kg N_2O/tHNO_3 was correctly applied in the ERU calculation of the whole period. The benchmark value of the methodology (2.5 kg N_2O/t HNO_3) exceeds the legal limit and was not taken into account. Subperiod 3.2: The maximum emission factor of 1.85 [kg N_2O/t HNO_3] from 2012-01-01 on has been exceeded on 5 hours and was correctly applied in the ERU calculation. Remark: FAR B2: It must be proven at each verification, that the plant's average emission levels for the past year did not exceed the regulatory limit.				
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 calculation includes: • A deduction in baseline emission scenario from 7 to 1.85 kg N_2O/t HNO_3 (benchmark values) in year 2012. • A legal limit of 2.47 kg N_2O/t HNO_3 for 2009-2011. • A 10% reduction of the verified emission reductions • Increase of project specific emissions of 1% due to exceedance of permitted overall uncertainty by 1 % *Means of determination:* Methodology *Conclusion:* The implementation of the benchmark values and 10% reduction is a conservative approach.	/METH/ /MR/ /XLS/ /OTN8/ /NCSGN8/			OK

	Applicable to JI SSC projects only					
C.6	*DVM § 96* Is the relevant threshold to be 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?	*Description:* Estimation of total emissions reductions over the crediting period (after the 10% deduction) of 3 years and 1 month are: 795,579 (tonnes of CO_2e) according to the PDD. *Means of determination:* PDD *Conclusion:* The average value of ERUs per year obviously exceeds the threshold value of 60,000 t CO_{2e} per year; the project is classified as large-scale project.				
	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				

	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)* AIEs the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				

	for the establishment of monitoring plans?					
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 procedures, quality control and quality assurance are implemented as follows:
		• Measured values were generated by local measurement and monitoring devices, stored in plant DCS and provided for calculation via OSI PI (process information) data acquisition system.
		• Default i.e. plant trip point-values were determinated before start of the project and included in the PDD.
		• During data processing, measured values were evaluated according to statistical methods:
		  • Application of instrument correction factors:
		The PP chooses a monitoring standard that requires the establishment of a calibration curve (EN14181). The correction factors derived from this calibration curve during the QAL2 audit must be applied onto both VSG and NCSG calculations. Correction factors are:
		  ○ 0.98 for stack gas flow meter
		  ○ 0.97 for measurement of N_2O conc.
		  ○ 1.0 for pressure of tail gas
		  ○ 0.99 for temperature of tail gas
		The values were applied on the xls-calculation.
			/PDD/
			/METH/
			/MR/
			/PROCD/
			/QAL2CAL8/
			/QAL2INST/
				CAR C1	~~CAR C1~~
					Pls. see Chapter 4.
						OK

		• Plausibility check: The methodology requires a plausibility check of all recorded/monitored data before processing which was conducted by the PP. plausibility criteria is: Negative values shall be eliminated. • Downtimes of the AMS: Acc. to the methodology, downtimes of the AMS shall be handled as following: The hourly average will be calculated based on the remaining values for the rest of the hour in question. If these remaining values account for less than 50% of the hourly data for one or more parameters, then this hour must be eliminated from the calculation and a substitute value will be used instead. • Missing data/Substitute value In the case where it is impossible to obtain one hour of valid data for one or more elements of the emissions calculation due to downtime or malfunction of the AMS a substitute value for each hour of missing data shall be calculated as follows: $C^*subst = C + \sigma_C$ where: C: arithmetic average of the concentration of the relevant parameter σ_C: best estimate standard deviation of the concentration of the relevant parameter. • Permitted overall uncertainty:				

		The methodology requires that the permitted overall uncertainty of the average hourly annual emissions must be less than 7.5% if technical possible. The determinated (combined) uncertainty for N_2O mass flow measurement as per QAL2 report is 8.5% which exceeds the permitted overall uncertainty by one percent. If the total established uncertainty is higher than the permitted overall uncertainty, the project specific emissions are to be increased by the difference between the established uncertainty value and the permitted overall uncertainty value. The PP accordingly increases the project emissions for 1%. *Means of determination:* Methodology, Monitoring report, on-.site visit of plant, control room with PCS, server room with Exaquantum data server, QAL2 report *Conclusion:* All procedures related to fulfil the requirements of • quality management of the plant • quality assurance standard of the AMS • data processing as required per methodology were implemented. <u>CAR C1:</u> Excel-sheet • The formula to compensate wet/dry measurement				

		conditions of NCSG is not correct • The calculation sheet includes non relevant calculations/ contents				
E.2	*DVM § 101b)* Is the function of the monitoring equipment, including its calibration status, is in order?	*Description:* The AMS is included in the quality procedures which are established for proper operation of the plant. The plant operator conducted a certified company (SPIE) for maintenance of all MMD of the plant. The PP therefore provides sufficient information regarding contractual/responsibility issues and scope of work. Additional measures are related to the European Norm EN14181 (2004) "Stationary source emissions - Quality assurance of automated measuring systems". Müller BBM was conducted to carry out these measures. • **Three quality assurance levels of EN 14181**: • QAL 1: performance approval The suitability of the analyser for the project was proved through the QAL2 audit in 2010, which was performed by an independent laboratory with EN ISO/IEC 17025 accreditation. • QAL 2: commissioning and validation of an AMS An accredited laboratory (acc. ISO 17025) carries out specific testing procedures to verify that the AMS installation meets the accuracy requirements laid down by EN 14181. The performance of the complete installation was compared against a series of measurements made with approved Standard Reference Methods. QAL2 test was carried out in 2009.	/AST/ /QAL2 INST/ /QAL2 CALIB/ /CERT/ /PROC1/ - /PROC12/	CAR E1	~~CAR E1~~ Pls. see Chapter 4.	OK

		• QAL 3: ongoing operation and maintenance The PP implemented a quality assurance system to prove the ongoing compliance of the AMS with the norm. The maintenance activities are monitored and controlled as part of an overall quality assurance programme. • AST: Annual Surveillance Test The PP verifies the continuing validity of the calibration function on yearly basis. The requirements and responsibilities for carrying out the AST tests are the same as for QAL 2. The 1. AST test took place in 2010. No AST was conducted in 2011. This AST has been carried out on 2012-01-04 which is delayed for 4 days. *Means of determination:* Methodology, EN14181, interview with monitoring manager of the plant, check of relevant documents and records. *Conclusion:* QA/QC-system implemented for the management of the project activity is mainly in order. Regarding the missing AST in 2011: Since the plant was not in operation between 2011-09-11 and the end of the year, the PP was not able to carry out the annual suitability test in 2011as scheduled. After 2012-01-02 17:00 the plant was back in regular operation and the AST was successfully performed on 2012-01-04. This causes a difference to original ERU calculation for the whole verification period of 0.02 % (see chapter 5.4).				

		The verification team believes that this difference is negligible and hence no action was requested. One finding has been raised in context of data processing: <u>Car E1:</u> AST-report: The pipe diameter at velocity sampling point in the actual AST report is not as per drawing 55.100-Plan 40/STACK/.				
E.3	*DVM § 101c)* Are the evidence and records used for the monitoring maintained in a traceable manner?	*Description:* All monitoring data are collected from the MMD as 4-20 mA signals and digitally forwarded to the plant via DCS on a digital Modbus on two second basis. Recording frequency of NCSG and VSG in data logger is 10 sec. A data extract of hourly mean values is reported to the assessment team (at N.serve), *Means of determination:* Excel-datasheet for ER-calculation, data collections on second-basis provided by the plant operator during on-site visit (spot-check of single days) *Conclusion:* The verifier confirms that all data are traceable and correctly collected, converted and stored from MMD to ER-calculation sheet. A mistake in data processing of NCSG value was detected and corresponding actions requested: To ease future verifications, the verification team requests the whole set of raw data provided from the plant to the data manager at N.serve for this and future verification. For this verification the PP N.serve provided on monthly basis the raw data in an unprotected XLS-sheet. The verification team spotchecked these data plots with data in monitoring report and with server data stored in the Exaquantum system on	/XLS/ /EMISN8/ /EIPSN8/ /DCSN8/ /DECLA/ /RAW-XLS/	FAR E2	FAR E2	OK

		plant. No discrepancies were found. FAR E2: The correspondence with raw data provided by the plant to N.serve for data processing shall be forwarded to the verification team before verification. The verification team can confirm through spot checks for this verification period that management of data extraction and management are in order.				
E.4	*DVM § 101d)* Is the data collection and management system for the project in accordance with the monitoring plan?	*Description:* All process data relevant to the project activity are proper generated in the MMD as analogue signals, digitally transferred to the PSC and stored in the DCS in digital format. Hourly mean values were automatically calculated. Operating hours of the plant and AMS where generated and stored (value 0 or 1) to give the status information for data assessment. *Means of determination:* Records of the DCS, compared with methodology and monitoring plan of PDD. *Conclusion:* The PP implemented a state-of-the-art plant operation and data collection system. In the context of the project activity the verifier found some chances to improve the data check and processing procedures and raises some FARs, to improve the quality in the future: CAR C1: Excel-sheet • The formula to compensate wet/dry measurement	/PDD/ /MR/ /XLS/ /EMISN 8/	CAR C1 CAR E1 CAR E3	~~CAR C1~~ Pls. see Chapter 4	OK

		conditions of NCSG is not correct • The calculation sheet includes non relevant calculations/ contents.				
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* AIEs the verification ensures 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* AIEs the monitoring period not overlap with previous monitoring periods?	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
F.5	*DVM § 105* *If the AIE learns of an erroneously included JPA,* has	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				

	the AIE informed the JISC of its findings in writing?					
	Applicable to sample-based approach only					
F.6	*DVM § 106* *AIEs 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;* *– 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*	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				

	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 AIEs not identify and take into account such differences among JPAs, then (AIEs the sampling plan) provide a 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*	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				

	secretariat along with the verification report and supporting documentation?					
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 of the number of total JPAs, rounded to the upper whole number, then AIEs the AIE provide a reasonable explanation and justification?*	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				
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	*Description:* N/A *Means of determination:* N/A *Conclusion: N/A*				

	claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?					