JI VERIFICATION REPORT

- 1ST PERIODIC –

GPN S.A.

GPN GRANDPUITS N_2O ABATEMENT PROJECT

ITL PROJECT ID : FR1000169

Monitoring Period: 2010-04-18 to 2011-08-31
(incl. both days)

Report No: 8000400354 – 11/539

Date: 2012-10-24

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Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***	***Date of this rev.***
	8000400354 – 11/539	0	2012-10-24	2012-10-24
Project:	***Title:***	***JI Track:***	***Registration date:***	***ITL Project ID.:***
	GPN Grandpuits N_2O abatement project	☒*1* ☐*2*	2010-04-18	FR1000169
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'*			5
Monitoring:	***Monitoring period (MP):***		***No. of days:***	***MP No.***
	2010-04-18 to 2011-08-31 - both days included		501	1
Monitoring report:	***Title:***		***Draft version:***	***Final version:***
	GPN Grandpuits N_2O abatement project		V. 01	V. 02 (dated 2012-10-24)
Verification team / Technical Review and Final Approval	***Verification Team:***		***Technical review:***	***Final approval:***
	Rainer Winter (TL) Dirk Speyer Sabine Meyer		Ulrich Walter	Martin Saalmann
Emission reductions: [t CO_2e]	***Verified amount***		***As per draft MR:***	***As per PDD:***
	89,511		**91,916**	**171,924 related to 501 days**

Summary of Verification Opinion:

GPN S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the project: "*GPN Grandpuits N_2O abatement project*", with regard to the relevant requirements for JI (Track 1) project activities. The project reduces GHG emissions by means of the implementation of a secondary catalyst in the ammonia reactor that allows the catalytic decomposition of nitrous oxide. This verification covers the period from 2010-04-18 to 2011-08-31 (including both days).

In the course of the verification 6 Corrective Action Requests (CAR) and 6 Clarification Requests (CL) were raised and successfully closed. Furthermore 3 FARs were raised. The verification is based on the draft monitoring report, revised monitoring report, 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 project monitoring is in accordance with the applied approved monitoring plan.
- 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 1st 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 (including a deduction to 90% according to the Arrêté du 2 mars 2007):

	Emission reductions: 89,511 t CO_2e	
Document information:	*Filename:*	*No. of pages:*
	2012-10-24 FVR 1_st_VER_GRANDPUITS final&FA .docx	80

Abbreviations:

AIE	**Accredited Independent Entity**
CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CDM	**Clean Development Mechanism**
CO_2	**Carbon dioxide**
CO_{2eq}	**Carbon dioxide equivalent**
CL	**Clarification Request**
DVM	**Determination and Verification Manual**
ER	**Emission Reduction**
ERU	**Emission Reduction Units**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
JI	**Joint Implementation**
MP	**Monitoring Plan**
MR	**Monitoring Report**
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 1st periodic verification of the project

"GPN Grandpuits 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 FR1000169[1].

GHG data for the monitoring period covering 2010-04-18 to 2011-08-31 (501 days) was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Determination and Verification Manual /DVM/ of the UNFCCC.

This report summarizes the findings and conclusions of this 1st 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 spread sheet /XLS/, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

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

- Article 6 of the Kyoto Protocol /KP/,

[1] http://ji.unfccc.int/JIITLProject/DB/CYDURPJS4YBLNLPGCO6DPY0MHF1GAO/details

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

2. GHG PROJECT DESCRIPTION

2.1. Project Characteristics

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

Table 2-1: Project Characteristics

Item	Data		
Project title	"GPN Grandpuits 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
Approved CDM Meth:	*Projet Domestique Methodology: "Catalytic reduction of N_2O at nitric acid plants"*		
Technical Area(s):	N_2O (5.1)		
ITL Project ID No.:	FR1000169		
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (according to LoA till 31st December 2012)		

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	2010-04-18[2]	-
2	Start of crediting period	2010-04-18	-

[2] Date of LoA by Host Country (Since the LoA application was made on 18/02/2010, the official starting date of the first verification period is 2010-04-18.)

#	Item	Time	Status
3	1st Monitoring period	2010-04-18 to 2011-08-31	Matter of this verification

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. (Courbevoie)
		Total Petrochemicals (Antwerpen)
		N.serve Environmental Services GmbH
Other involved party/ies	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 Central (Ile de France) Département: Seine-et-Marne
Project location address	Commune: Grandpuits-Bailly-Carrois GPN Usine de Grandpuits, BP12, 77720 Mormant, France
Plant Coordinates	Plant tail gas stack: Lat: 48°35'52.82"N Long: 2°57'06.05"E Ammonia burners: Lat: 48°35'52.82"N Long: 2°57'06.05"E

2.5. Technical Project Description

The project activity aims to reduce levels of N_2O emissions from the production of nitric acid with a secondary N_2O abatement technology: the project involves the installation of a secondary N_2O reduction catalyst at the nitric acid production plant. The emission reductions are a result of the catalytic decomposition of nitrous oxide. Nitrous oxide which is formed as by-product of the nitric acid production will be removed by the catalyst installed below the standard precious metal gauze pack in the 4 ammonia burners. The nitrous oxide would otherwise be emitted as part of the tail gas of the nitric acid plant to the atmosphere.

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

Table 2-5: Technical data of the project

Parameter	Unit	Value
Ammonia Oxidation Reactor		
Manufacturer	-	GPN S.A.
Diameter	mm	3,660
Start of commercial production	-	1970
Operating conditions as per specifications (trip point values)		
- Temperature (min/max):	°C	800-920
- Pressure (min/max):	MPa	0.35 (at the precious metal gauzes) 0.3 (max in Air flow)
- Ammonia to Air ratio (max)	Vol.-%	8 – max 12.50
Number of reactor units	-	4
Ammonia Oxidation Catalyst		
Manufacturer	-	Heraeus
Type	-	HR-SC N_2O abatement system
Composition:	-	Pt-Rh-Pd
Absorber		
Design capacity per day (100%)	t/d	1,250
Design capacity per day (legal)	t/d	1,250
Annual operation (design)	days	360
Annual operation (practice)	days	340
Secondary Catalyst		
Start of operation	-	app. 2009-12
Manufacturer	-	Heraeus
Type	-	HR-SC N_2O
Design efficiency N_2O reduction	%	up to 90% max,
N_2O Analyzer (stack) used since 06/05/2010 until 28/06/2010		
Manufacturer	-	Gasmet Technologies
Type	-	Gasmet DX-4000 Multigas analyser
Measurement Principle	-	FTIR
N_2O Analyzer (stack) used since July 2010		
Manufacturer	-	Finetec
Type	-	Orbital AIT Anafin 5000
Measurement Principle	-	NDIR (hot extractive analyzer)
Stack volume flow rate measurement used since 01/06/2011		
Manufacturer	-	Yokogawa
Type	-	Yokogawa Itabar (Yokogawa IBF-35-ID1100/9mm-S-SM-C01-0-0-0-0-X180-HL-T0-A15-A71)
Measurement Principle	-	Back pressure probe with pressure difference transmitter

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

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

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

Table 3.1: Verification sequence

Topic	Time
Assignment of verification	2011-09-01
On-site visit	2011-10-05 – 2011-10-06
Draft reporting finalised	2012-04-01
Final reporting finalised	2012-10-24
Technical review finalised	2012-10-24

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.

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence	Technical competence [4,5]	Host country Competence	Onsite visit
☒ Mr. ☐ Ms.	R. Winter	TÜV NORD CERT, Germany	TL	SA	☒	5.1	☐	☐
☒ Mr. ☐ Ms.	D. Speyer	TÜV NORD CERT, Germany	TM	A	☒	5.1	☐	☒
☒ Mr. ☐ Ms.	S. Meyer	TÜV NORD CERT, Germany	TM	LA	☒	-	☒	☐
☒ Mr. ☐ Ms.	U. Walter	TÜV NORD CERT, Germany	TR[3]	LA	☒	5.1	☐	☐
☒ Mr. ☐ Ms.	M. Saalmann	TÜV NORD CERT, Germany	FA[3]	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] No team member

[4] As per S01-MU03 or S01-VA070 A2 (such as 1.1, 1.2,.....), according to the Accreditation Standard (Version 2) for the team members

3.4. Publication of the Monitoring Report

In accordance with decison 9/CMP.1 (§ 36) the draft monitoring report, as received from the project participants, has been made publicly available on the dedicated website http://www.global-warming.de during a 30 days period (2011-10-13 until 2011-11-13). No comments were received.

(If applicable, comments received are taken into account in the course of the verification.)

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 below.

Table 3-2: Identification of verification risk areas

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*)**

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 occurance.	*The potential risks of raw data generation have been identified in the course of the monitoring system implementation.* *The following measures were taken in order to minimize the corresponding risks.* *The following measures are implemented:*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.*	*The additional verification testing performed is described. Testing may include:* - *Sample cross checking of manual transfers of data* - *Recalculation* - *Spreadsheet 'walk throughs' to check links and equations* - *Inspection of calibration and maintenance records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

The completed table 3-2 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

Periodic verification checklist						
No.	***DVM[3] paragraph / Checklist Item*** *(incl. guidan-ce for the determi-nation team)*	***Initial Finding*** *(Means and results of assessment)*	***Ref.***	***Action requested to project participant*** *(CAR, CL, FAR)*	***Review of PP´s action***	***Conclu-sion***
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 fur-ther subdivi-ded as per the require-ments 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 in-formation source on which the assess-ment 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 assess-ment refers to the draft verification stage.*	*Assess-ment 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 assess-ment refers to the final verification stage.*	*Final assessment at the final verfication 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:

[3] 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 / JI and 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 following verification team member attended the site visit: D. Speyer.

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 Grandpuit S.A. and N.serve (project consultant) including the operational staff of the plant were interviewed. The main topics of the interviews are summarised in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel,	- General aspects of the project - Technical equipment and operation

Interviewed Persons / Entities	Interview topics
2. Consultant	- Changes since determination - Monitoring and measurement equipment - Remaining issues from determination - Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG emission reduction calculation - Procedural aspects of the verification - Maintenance - Environmental aspects

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 form 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

Nonconformities 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	2	0	1
B – Project Implementation	0	2	0
C – Monitoring Plan Compliance	3	3	1
D – Monitoring Plan Revision	0	0	0
E – Data Management	1	0	1
F – Monitoring Report	0	1	0
SUM	**6**	**6**	**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:	**CAR A1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Clarification is requested if Belgium and Germany are considered as involved parties. LoAs of investor counties are still pending. The investor LoAs should be provided to IAE.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*Clarification regarding parties involved to the project has been provided in section 2.1.The Host country LoA and Investor country LoA has been provided to the AIE.*		

IAE Assessment #1

The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.

The project participant N.serve Environmental Services GmbH initially planned to choose Germany as investor country, as stated in the PDD.

However, during the course of project implementation, the project participant N.serve Environmental Services GmbH has been applied under the host county France (together with GPN S.A. ,Courbevoie). The original host country LoA from France, dated 21/06/2010, authorized the participation of GPN S.A. (France) and N.serve Environmental Services GmbH (Germany) in the Grandpuits project.
Later, Total Petrochemicals, Antwerpen has been also applied under the host country France.
A second host country LoA was issued on the 10/11/2011 by the host country France, allowing Total Petrochemicals Antwerpen to become a participant in the project.

PP provided except the host country LoA an investor LoA issued by the National Climate Commission of Belgium. The LoA is issued to GPN S.A which is involved in the project as a PP.

The LoA, dated 04 April 2011, (DPF Ref: NKC/FP/5) was issued by the Belgian National Climate Commission which is the Belgian Designated Focal Point as mentioned on the JI-SC website. The LoA stipulates in the text: Belgium has ratified Kyoto Protocol on 31st May 2002; Belgium meets the requirements and fulfil the participation requirements throughout the Kyoto commitment period; Belgium approves this project and authorises GPN S.A to participate in this project. The PP GPN S.A and the project title are clearly named on LoA.

Name of Party involved	**Private and/or public entity(ies) project participants**
France (host)	- GPN S.A. (Courbevoie); - Total Petrochemicals (Antwerpen); - N.serve Environmental Services GmbH.
Belgium (investor)	- GPN S.A

Therefore CAR A1 has been closed out.

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

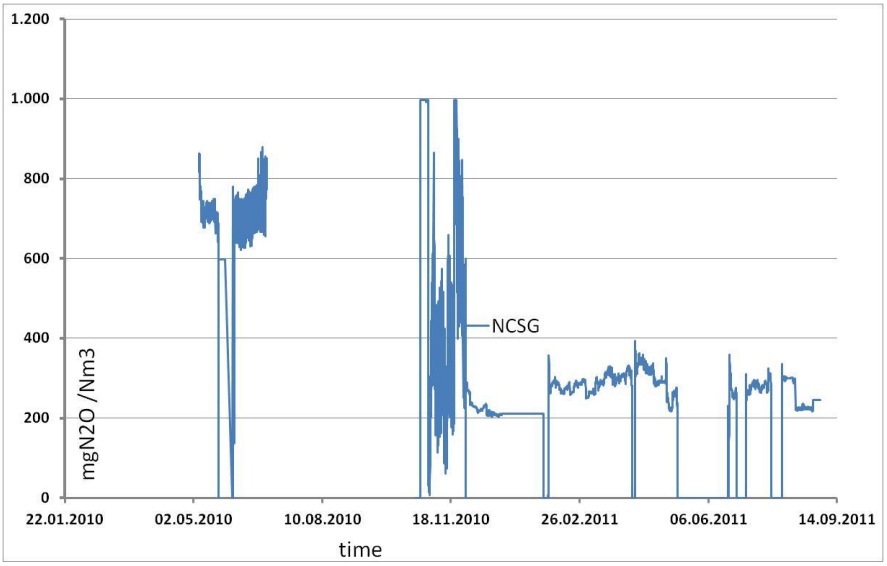
Finding:	**CAR A2**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	As per the Letter of Approval (LoA) the crediting period of the project is limited to the 1st Kyoto commitment period. The exact crediting period shall be indicated in the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The crediting period as per existing LoA is limited until 31/12/2012. The Monitoring Report has been adapted accordingly.*		
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The verifier checked the revised Monitoring Report and concludes that the exact crediting period until 31/12/2012 is now included. Therefore CAR A3 has been closed out.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**FAR A3**		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The verifier should check that the total amount of verified emission reductions until 2012-12-31 is limited as per host country LoA to 296 047 tonnes CO_2e (before 10 % reduction).		
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 A3
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:	CL B1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	A further detailed description of the implementation of the AMS (analyser, stack flow meter, data acquisition system) with key events regarding purchase order, installation, implementation, commissioning, issues, delayed QAL2 test shall be included in the Monitoring Report (and/or listed as a supporting document) and evidenced with related correspondence.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The document has been provided as supporting document to the the AIE.*		
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	Related documents to the implementation history of AMS have been provided by PP to the verifier. The verifier conclude that information was confirmed during interviews with the PP, responsible staff of GPN nitric acid plant and evidenced with send documents. A summary of the implementation history is in chapter 5 shown (Table 5.1: timetable of project implementation and installation issues). Therefore CLB1 has been closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	CL B2		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The justification on the concentration gradient of N_2O in the stack gas during the Monitoring Period shall be further elaborated. The exchange and refill of secondary N_2O abatement catalyst shall be also specified in MR.		

Finding:	CL B2
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The N_2O emissions gradient as well as the catalyst exchange and refill has been explained in section 7.1 of the Monitoring Report.*
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The following diagram shows the measured N_2O concentration gradient (without substitutes values) in the stack gas of the plant during the monitoring period:  The following reasonable elaboration of the N_2O concentration gradient has been evidenced: a by-pass problem occurred in secondary catalyst bed which reduced the abatement catalyst efficiency drastic since the start of monitoring period until November 2010. Furthermore the gauzes were damaged in one AOR caused by N_2O catalyst installation work. Problems were solved during an overhaul in October and November 2010. A new catalyst batch was filled in week 41 into the basket resulting in a further higher N_2O destruction efficiency. The secondary catalyst was refilled during the plant shutdown in May until June 2011. Therefore CL2 has been closed out.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**CAR C1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	During onsite visit it has been identified that the TRIP values as indicated in MR and PDD are inconsistent to the plants implemented values. TRIP points should be mentioned according to the values applied in the safety procedures.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*All values have been corrected.*		
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The trip point range is updated in the MR as well as the calculation sheet for the AOR temperature (800°C to 920°C) and the maximum ammonia to air ratio is 12.5%. The verifier confirms that figures for TRIP points have been mentioned according to the values applied in the safety procedures. CAR C1 has been closed out.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☒ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**CL C2**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Clarification is requested on the "real" measurement frequency for all relevant parameters.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*Clarification regarding the factual measurement frequency has been provided in section 7.1 as well in the respective table of Annex 1 of the Monitoring Report.*		

Finding:	CL C2
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	Further information regarding the measurement frequency has been provided in revised MR. The verifier concludes that the storage frequency of the PI system has a minimum storage interval of 5 seconds. Requirements as per PDD are met. Hourly average values based on continuous monitoring are used in the calculation of project emissions and related emission reductions. CL C2 has been closed out.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	CL C3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The cross check procedures of measured NAP with the official production figures should be described in detail.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The cross check procedure has been illustrated and described in Annex 4 of the Monitoring Report.*		
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The revised monitoring report was checked by the verification team and it can be concluded that described procedures for the cross check of NAP figures are acceptable and the verification team confirmed the appropriateness of this approach. The information given in the revised MR is correct and same was observed during the plant visit. CL C3 has been closed out.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	CAR C4		
Classification	☒ CAR	☐ CL	☐ FAR

Finding:	CAR C4
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The PP should evidence the appropriateness of the AMS with regard to e.g. location of the sampling point, QAL2 and uncertainty assessment. Installation and commissioning protocols of the AMS shall be provided.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*A full QAL2 test was performed between 8/11/2011 and 10/11/2011. The suitability of the installed measurement equipment was proven and data correction factors were derived and applied to the measurements. The QAL2 report as well as installation and commissioning protocols are 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.*	A QAL 2 test was performed by Müller-BBM between 8/11/2011 and 10/11/2011, after the first monitoring period. The verifier confirms that the QAL2 performance test is evidencing the appropriateness of the installed AMS; during the QAL2 test the installation of the AMS have been checked. Furthermore the calibration of the installed AMS by means of parallel measurements with a SRM, the determination of the variability of the AMS and the check of compliance with the required uncertainty have been performed. Therefore CAR C4 has been closed out.
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:	FAR C5		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The verifier of the next period shall check the correctness of AMS-parameterisation (e.g. QAL2 parameter, stack diameter, moisture, uncertainty).		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*			

Finding:	FAR C5
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	
Conclusion *Tick the appropriate checkbox*	☒ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding:	CL C6		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Mass balance used for tail gas flow calculation during the time as non volume flow meter was in operation. • The equipment with which primary and secondary airflow is measured should be listed in the MR. • Clarification is requested on the determination of O_2 in the stack flow which is used in the VSG calculation. • The calculation method of VSG and the used parameter O_2, (normalized) primary, secondary and tertiary airflow should be explained in detail in the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*The meters used to measure the primary-,secondary air flow and the O_2 concentration in the stack gas have been added to the monitoring devices list in Annex 3* *The calculation of the volume stack gas has been performed in accordance with the French norm BP X 30 331, Protocole de quantification des émissions de protoxyde d'azote dans la fabrication d'acide nitrique, issued by the Association Francaise de Normalisation. Reference has been provided in section 5.3.2. of the Monitoring Report.*		

Finding:	CL C6
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	For time period from 18/04/2010 to 31/05/2011 the tail gas volume flow meter for measuring VSG_n was installed but was not working correct. For that time period the PP considered to apply alternative methods for determination the volume flow of stack gas. As per MR version 1 and 2 and emission reduction calculation the following both approaches were chosen: Correlation I (for time period from 18/04/2010 to 27.06.2010): VSG_n [kNm^3/h] **=** 200/250 x1/1000 x (Primary Air Flow + Secondary Air Flow) Correlation II (for time period from 25/10/2010 to 31/05/2011): according the French norm AFNOR (02/2003), BP X 30 331, Protocole de quantification des émissions de protoxyde d'azote dans la fabrication d'acide nitrique, page 8. The alternative calculation procedure is based on measurements of the primary-, secondary-, and tertiary air inflow to the ammonia burner and the oxygen concentration in the tail gas: $VSG_n = \frac{79*(Q_{EP}+Q_{ES}+Q_{ET})}{(100-C_{O2})}$ Q_{EP} primary air in (Nm^3/h) Q_{ES} secondary air in (Nm^3/h) Q_{ET} tertiary air in (Nm^3/h) C_{O2} concentration of O_2 in stack gas in % The verifier accepts the approach of correlation II. But further clarification is requested on correlation I, as there is a lack of information and the theory on which the calculation is based not clear.
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	A new emission reduction calculation sheet was prepared by the PP and presented to the verifier. For whole time period from 18/04/2010 to 31/05/2011 the tail gas volume flow is determined based on correlation II.

Finding:	CL C6
IAE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments shall be added.*	The verifier has checked revised project documentation and concludes that the applied approach is acceptable and according the French Projet Domestique methodology. The methodology allowed in the case where no data for a parameter is available the substitution with values calculated by using a mass balance. Primary and secondary air inflows as well as the O_2 concentration of the tail gas have been continuously measured by the following meters which are suitable for the purpose: Q_{EP}: Rosemount 1151 DP3, Differential pressure (accuracy: 1%) Q_{ES}: Rosemount 3051 CD1 A02A1, Differential pressure (accuracy: 1%) C_{O2}: Setnag oxygen analyzer (accuracy: 2%) The constant tertiary airflow which is part of the cooling system of the burner was determined conservative on the technical specification of the used compressor. The verifier has also checked the difference between calculated tail gas volume flow and measured for the time interval when the flow meter was without malfunction and conclude that calculated flow is about 4% higher than measured flow (05.07.2011 – 01.09.2011). It can be confirmed that the monitoring parameter VSG_n have been determined and measured without material misstatements in an exact manner and in line with applicable standards. Therefore CAR C6 has been closed out.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	CAR C7		
Classification	☒ CAR	☐ CL	☐ FAR

Finding:	CAR C7
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	During the verification process the verifier found that data are available (REJETS DE L'ATELIER D'ACIDE NITRIQUE) which can be used for periods in which no values were recorded in DCS. Therefore further clarification is requested if records for the most important parameters as VSG, NCSG, NAP and OH from "REJETS DE L'ATELIER D'ACIDE NITRIQUE" can be used for completing periods in which no values were recorded in the DCS.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Records from "REJETS DE L'ATELIER D'ACIDE NITRIQUE" were taken into account and a new emission reduction calculation sheet was prepared by the PP and presented to the verifier.
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The verification team has checked revised project emission reduction calculation sheet which use daily average data for VSG, NCSG, NAP and OH from the governmental reporting "REJETS DE L'ATELIER D'ACIDE NITRIQUE" for the time period of 01.07.2010 until 20.10.2010. The related NCSG values have been measured with an alternative meter at the outlet of the DeNOx, which has not undergone a QAL2 test. As data from the actual meter is lost, the time period has been considered as AMS downtime and substitute values were applied correctly. The NCSG value have appeared to be significantly above the benchmark for the whole of the said period, all hours were correctly excluded from the calculation. For the period 21.10.2010 01:00 until 25.10.2010 05:00 no data were available. Therefore not recorded values were not taken into account and excluded in ERU-calculation instead of the use of the substitute value. As no data related to the plant status or amount of NAP produced is available the use of the subst. value is not justifiable, and the verifier accepted this approach of excluding data for the related period. Therefore CAR C7 has been closed out.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**CAR E1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Following issues w.r.t. emission reduction calculation have been identified and subsequent clarification is requested: • No correction factor according QAL2 is used in the ER calculation. • For several hours the raw data are missing • For several hours data are missing in the ER calculation. • The trip point of 920°C should be used for determination of OH for ER calculation. • The extra hour at 2010-10-31 (summer - winter time change) should be taken into account for emission calculation in the Excel-file of the monitoring data. Also the winter-summer time change at 2011-03-04 should be taken into account.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*1. All QAL2 correction factors are applied. Applicability conditions are described in the calculation sheet and Monitoring Report.* *2. All available raw data have been introduced to the calculation sheet* *3. The temperature value of 920°C has been introduced as upper trip point value of the project activity* 4. *The change from summertime to wintertime on 2010-10-31 03:00 and from wintertime to summertime on 2011-03-27 02:00 has been applied in the worksheets "commented data" and "Calculations&corrections".*		

Finding:	CAR E1
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The verifier checked the revised emission calculation and concludes: • Trip point has been taken into account. • The extra hour has been considered. • Raw data has been included. The verifier found the QAL2 correction factors are also applied for NCSG results, measured with the temporary analyser, which was not part of QAL2 audit. A revision of ER is required. Furthermore clarification is requested about applied correlation I (for time period from 18/04/2010 to 27.06.2010) and meaning of figures: VSG_n [kNm^3/h] **=** 200/250 x1/1000 x (Primary Air Flow + Secondary Air Flow). The PP is also requested to take the measurement uncertainty into account for the temporary analyser as the analyser was not QAL 2 approved. The delayed QAL2 test and resulting potential uncertainty should also be taken into account.
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details*	The ER was corrected accordingly.

Finding:	CAR E1
IAE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The verifier checked the revised ER calculation sheet and concludes that all mistakes and lacks of clarity have been corrected: • The correction factors derived from the calibration curve of the QAL2 audit were correct applied to the parameters NCSG (analyzer), VSG, PSG and TSG. The correction factor for NCSG has been applied to the calculation only for the measurements from 21/10/2010 onwards; the correction factor for VSG has been applicable only from 01/06/2011 onwards. The correction factors for TSG and PSG have been applied for the whole of the verification period. • The maximum measurement uncertainties of the analyzers as per QAL 1 have been added to the measured data: Gasmet analyzer: +3.73 % and Finetech analyzer as per QAL 2: +2.13 %. The approach is conservative. • The PP changed the correlation I (for time period from 18/04/2010 to 27.06.2010) and used for this time interval also the French norm AFNOR (02/2003), BP X 30 331, Protocole de quantification des émissions de protoxyde d'azote dans la fabrication d'acide nitrique, page 8. The alternative calculation procedure is based on measurements of the primary-, secondary-, and tertiary air inflow to the ammonia burner and the oxygen concentration in the tail gas. Therefore CAR D6 has been closed out.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	FAR E1		
Classification	☐ CAR	☐ CL	☒ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	A procedure to backup the raw monitoring data could not be evidenced during the onsite visit. This procedure should be checked in the 2nd Verification.		

Finding:	FAR E1
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE 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

Finding:	CL F1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The following misstatements in the Monitoring Report (v.01) provided to the verification team were identified: 1. Project name is incorrect. 2. Format of data units and parameters shall be given correctly. 3. The dates according the regulatory N_2O emission limit should be revised. 4. Table 1, monitoring devices: The AST did not check or calibrate the instrument for NAP temperature measurement. 5. A definition of "implausible values" should be given. 6. The reported last day of monitoring period (30th August) is not consistent with ER calculation. 7. Name and type of stack flow meter is different to project documentation and observation during the audit.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	*All misstatements have been corrected.*		

Finding:	CL F1
IAE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and IAE assessments (#2, #3, etc.) shall be added.*	The verifier has checked revised monitoring report and concludes that the misstatements have been corrected. CL has been closed out.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CLs 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 have been implemented.

Due to initial problems with the implementation commissioning and processing of the Automated Monitoring System (AMS) and the delayed order/implementation of the final analyser following deviations to the planned situation as per PDD has been observed:

a) Data management

During the first months of this verification period the data storage capacity did not suffice to store the raw data for more than 6 month. Therefore, the raw data (some hourly mean value and every 5-sec value) have been inevitably lost from the data management system for time period from 18/04/2010 to 25/10/2010. For the time period from 01/05/2010 to 30/06/2010 and 25/10/2011 to 31/10/2011 only hourly mean values has been stored and every 5-sec values have been lost. Data has been lost also for 26/05/2011 9:00 until 01.06.2011 9:00.
Therefore daily average data from the governmental reporting "REJETS DE L'ATELIER D'ACIDE NITRIQUE" were taken into account in the emission reduction calculation for the time period of 01.07.2010 until 20.10.2010. As data from the actual meter is lost, the time period has been considered as AMS downtime and substitute values were applied correctly. As the substitute NCSG value is significantly above the benchmark for the whole of the said period, all hours were excluded from the calculation.

Hence the final emission reduction calculation is only based on the hourly averages values during periods of functional data storage. Therefore the verifier couldn't crosscheck the calculated hourly mean values with original measured every 5-sec values for the time periods in which the data management system stored only hourly values. The verification team confirms that the use of the hourly mean values for emission reduction calculation is according the methodology correct and acceptable.

b) N_2O concentration measurement

Due the delayed availability of the planed project N_2O-analyser a temporary analyser was used to measure the N_2O concentration NCSG in stack gas in the period May until June 2010. The PP applied a portable QAL1 certified Gasmet

DX- 4000 Multi-Gas analyser (Gasmet Technologies). The verifier concludes that the used analyser was during the applied period proper calibrated and QAL3 and suitable for the purpose. Nevertheless a QAL2 test was not performed. For the sake of conservativeness the maximum measurement uncertainty determined during the QAL1 test (+3.73%) has been applied (measured N_2O concentration x 1.0373). Therefore the verifier concludes that the use of temporary analyser is acceptable[*)]; the hourly averages applied for the calculation of emission reductions are real, measureable and conservative.

The temporary analyser has been replaced by the project analyser, Finetech FTIR Orbital AIT Anafin 5000 hot extractive analyzer, in July 2010. The Finetech analyser is not QAL1 approved for N_2O and therefore a QAL2 has been conducted on this analyzer. According to the methodology this approach is acceptable to use a non-QAL1 Analyzer in the case a QAL2 confirms its suitability. The final project analyser had delivered the NCSG data available from 25/10/2010 until the end of the verification period. The verifier concludes that the instrument was during its use proper QAL3 calibrated. But the suitability and accuracy of the Finetech analyser was proven in the QAL2 test, which was performed **after** the monitoring period between 8/11/2011 and 10/11/2011. Therefore the PP applied the maximum measurement uncertainty as per QAL2 test of +2.13% on all measured values. The verifier confirms that the applied approach is conservative.

c) Stack gas flow measurement

The project stack gas flow meter (Yokogawa meter, BF-35-ID1100/9mm-S-SM-C01-0-0-0-0-X180-HL-T0-A15-A71) could be put in operation in May 2011. First correct VSG values from the stack gas flow meter were measured and recorded after 01/06/2011. Since all VSG measurements have been delivered by the flow meter. Erroneous measurements before had not been suitable for the purpose for the calculation of emission reductions.

All values generated before 01/06/2011 were obtained by means of the mass balance calculation according the French norm AFNOR (02/2003), BP X 30 331, Protocole de quantification des émissions de protoxyde d'azote dans la fabrication d'acide nitrique, page 8. The alternative calculation procedure is based on measurements of the primary-, secondary-, and tertiary air inflow to the ammonia burner and the oxygen concentration in the tail gas:

[*)] As per French Projet Domestique Methodology "The project proponents have a deadline of 6 months from the date of project implementation to equip the plant with a suitable measurement system that complies with the …. specifications." This means "…for example, either the European Norm EN14181, the French AFNOR standard XP X43-305, as applicable, or any other monitoring standard considered acceptable in accordance with the requirements for assessing plant emissions in order to calculate payable N_2O tax) and shall provide accurate data on N_2O concentration and gas volume flow". These investments should be planned from the start of the projet domestique.

$$VSG_n = \frac{79*(Q_{EP}+Q_{ES}+Q_{ET})}{(100-C_{O2})}$$

Q_{EP}	primary air in (Nm^3/h)
Q_{ES}	secondary air in (Nm^3/h)
Q_{ET}	tertiary air in (Nm^3/h)
C_{O2}	concentration of O_2 in stack gas in %

The verifier accepts the temporary approach of correlation and concludes that calculated flow is higher than measured flow and therefore the flow is determined in a conservative manner. Primary and secondary air inflows as well as the O2 concentration of the tail gas have been continuously measured by meters which are suitable for the purpose.

It can be confirmed that the monitoring parameter VSGn has been determined and measured without material misstatements in an exact manner, conservative and in line with applicable standards.

Nevertheless, it was evidenced that the abatement system was in place and running for the entire period. The Heraeus secondary catalyst system was positioned below the standard precious metal gauze packs in the four ammonia burners. Such evidences are the purchase orders and delivery receipts of the catalyst and N_2O concentration measurements taken by the temporary project analyser.

Since the LoA application was made on 18/02/2010, the official starting date of the first verification period is 18/04/2010.

An overview about project implementation and installation issues is given in table 5.1 below:

Table 5.1: timetable of project implementation and installation issues

Date	Event details
April 09th to May 05th, 2010	**Annual Maintenance shut-down** -Gauzes replacement and turnaround of Burners (AOR) - Burners modifications and secondary catalyst implementation - Peackage created on stack pipe from instrumentation and analyser - Partial AMS implementation (T, P, Flow = not working, Analyser = pending) - Burner B gauze damaged during start-up
April 14th, 2010	**JI Project for GPN Grandpuits approved by French government**

From April 14th, 2010 to October 10th, 2010	**Data system/data storage is not correct functional:** Raw data (some hourly mean value and every 5-sec value) have been inevitably lost from data management system for time period from 18/04/2010 to 25/10/2010. For the time period from 06/05/2010 to 30/06/2010 and 25/10/2011 to 31/10/2011 only hourly mean values has been stored and every 5-sec values have been lost. Data has been lost also for 26/05/2011 9:00 until 01.06.2011 9:00.
April 15th, 2010	**Purchased order (#26815) of Analyser approved**
From May 6th to June 27th	- **N_2O emissions monitored with temporary Gasmet analyser** - **implemented stack flow meter is not working and the flow has been evaluated with the correlation**
July 05th, 2010	**Delivery of the final project Analyser**
July 06th to 08th, 2010	**Implementation of the final project Analyser**
July 08th, 2010	**Commissioning of the final project Analyser**
October 25th, 2010	**The final project analyser is messuring the NCSG data** available from 25/10/2010 until the end of the verification period
October 31st to November 21st, 2010	**Unplanned shut-down** **-**change gauzes -change secondary catalyst **- Maintenance and trouble shooting on stack flow meter (still inconsistency in measurements)**
Week 11, 2011 (14th to 18th of March)	**Scheduled QAL2 Test cancelled:** Stack flow meter not working correctly. Muller-BBM advised not to run the QAL2 test in this case.
May 13th to June 22nd, 2011	**Annual Maintenance shut-down** - Change gauzes -Cribbling of secondary catalyst **- Maintenance and trouble shooting on stack flow meter (still inconsistency in measurement)**
June 1st 2011	**Stack flow meter working correctly.**
5th to 9th of September 2011	Scheduled QAL2 Test postponed to week 37: **NH_3 shortage and shutdown the Nitric Plant on September 4th**
12th to 16th of September 2011	**Plant shutdown because of NH_3 shortage.** Scheduled QAL2 Test cancelled

October, 31st, 2011	**End of 1st Monitoring Period**
November 8th to 10th, 2011	**QAL2 test** by Muller-BBM

5.2. Project history

During the determination the AIE has raised 2 FARs that could not be closed or resolved during the validation stage:

*Determination **FAR B8**:* "*The processing of the monitoring data should be described step by step in the monitoring report*." The procedure of processing of the monitoring data has been checked by the verifier during the first verification. It can be concluded that the processing of data in ER calculation sheet is performed in a transparent manner and according to the methodology. Therefore no CAR was raised.

*Determination **FAR B13**: "The verifier has to check the appropriateness of the AMS (with regard to e.g. location of the sampling point, QAL1, QAL 2, uncertainty assessment)."* During the on-site the verification team has checked in detail the appropriateness of the Automated Monitoring System (AMS) in the context of the project activity. As the QAL2 test was not performed during the audit CAR C4 has been raised. A QAL 2 test was performed by Müller-BBM between 8/11/2011 and 10/11/2011, after the first monitoring period. The QAL2 performance test is evidencing the appropriateness of the installed AMS.

Furthermore as this is the 1st periodic verification no issues from former verifications are to be considered.

5.3. Special events

Due to initial problems with the monitoring system installation as well as due to problems with the data acquisition and storage system temporary deviations from monitoring plan occurred. A summary is given in chapter 5.1.

No other major events, apart of the reported plant shut downs for regular maintenance and due to trips and technical issues with effect on the monitoring of the project (which were spot-checked by the verifier) have been observed during the monitoring period.

5.4. Compliance with the monitoring plan

The monitoring system and all applied procedures are in principle in compliance to the registered monitoring plan. Due to initial problems with the commissioning,

installation and malfunctions of the AMS temporary deviations to the planned situation as per PDD has been observed. The temporary deviations are acceptable as the related monitoring parameter have taken their uncertainty into account. Therefore it can be confirmed that all monitoring parameters have been determined and measured conservative without material misstatements in an exact manner and in line with applicable standards.

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 to raised CARs and CLs were carried out by the project participant 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.

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

Parameter	**Calculated value/ mgN_2O/Nm^3**	**Parameter according to statistical analysis** (recalculated after elimination of data that lies outside the 95% confidence interval, not corrected)
$NCSG_n$	286.98	arithmetic mean value
	0.69	lower limit
	708.75	upper limit
Parameter	**Calculated value/ Nm^3/h**	**Parameter according to statistical analysis** (recalculated after elimination of data that lies outside the 95% confidence interval, not corrected)
VSG_n	122,140.02	arithmetic mean value
	94,146.00	lower limit
	150,037.00	upper limit

Table 5.5.2: Monitored plant data and parameter/input for ER calculation

Parameter	Unit	Applied value
OH_n	h	5,299
NAP_n	$tHNO_3$	202,627
OT	°C	Not applicable
AIFR	%	Not applicable
TSG	°C	Not applicable
PSG	Pa	Not applicable
EF_n	$kgN_2O/tHNO_3$	0.91665
EF_{reg}	$kgN_2O/tHNO_3$	2.50
GWP_{N2O}	$tCO_{2e}/ tHNO_3$	310
PE_n	kgN_2O	185,737.73

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, the request for deviation of the Monitoring Plan and other relevant requirements.

5.7. ER Calculation

According to the findings raised by the verifier, the PP should revise the ER calculation. Corresponding CARs (C1, C6, C7, E1) were raised. The accordingly adjusted ER calculation was prepared by the PP and presented to the verification team. All raised issues were addressed appropriately so the corresponding CARs could be closed out. Thus it is confirmed that the ER calculation is overall correct.

Table 5.7: Relevant data and outcome of ER-calculation

Parameter	Value	Unit
Nitric Acid Production (100% concentrate)	202,627	$tHNO_3$
Project Emission	185,737.73 57,579	kgN_2O tCO_2e

Emission Factor	0.91665	$kgN_2O/tHNO_3$
gvt. ERU deduction as per Arrêté of 2 March 2007	10	%
Emission Reductions	89,511	tCO_2e

5.8. Quality Management

Quality Management procedures for measurements, 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

Three (3) Forward Action Requests have been raised for the next verification.

6. VERIFICATION OPINION

GPN S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the project: "*GPN Grandpuits N_2O abatement project*", with regard to the relevant requirements for JI (Track 1) project activities. The project reduces GHG emissions by means of the implementation of a secondary catalyst in the ammonia reactor that allows the catalytic decomposition of nitrous oxide. This verification covers the period from 2010-04-18 to 2011-08-31 (including both days).

In the course of the verification 6 Corrective Action Requests (CAR) and 6 Clarification Requests (CL) were raised and successfully closed. Furthermore 3 FARs were raised. The verification is based on the draft monitoring report, revised monitoring report, 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 project monitoring is in accordance with the applied approved monitoring plan.
- 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 1st 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 (including a deduction to 90% according to the Arrêté du 2 mars 2007):

Emission reductions: **89,511 t CO_2e**

Essen, 2012-10-24

Rainer Winter
TÜV NORD JI/CDM CP
Verification Team Leader

Essen, 2011-10-24

Martin Saalmann
TÜV NORD JI/CDM CP
Final Approval

7. REFERENCES

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

Reference	Document
/14001/	ISO 14001 certificate of the plant valid until 2012-05-13
/9001/	ISO 9001 certificate of the plant valid until 2012-05-13
/AP/	Arrete prefecoral n° 09 DAIDD IC 142 limiting the maximum plant capacity on 1,250 t HNO_3/a, and limiting N_2O emissions to a maximum of 4kg N_2O/tHNO_3 from the start of the next production campaign in December 2009.
/ABSORB/	P&I-Flowsheet with instrumentation of the absorption tower
/AFNOR/	Monitoring standard BP X30-331 of the AFNOR-normalisation association of France
/AMS-CHK/	AMS Checking, Maintenance and Service documentation.
/AMS-INST/	AMS Installation documentation.
/AMS_CAL/	(QAL3): AMS manual calibration documentation for -Gasmet DX- 4000 Multi-Gas Analyser and -FINETECH FTIR Orbital AIT Anafin 5000 .
/BREF/	Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals – Ammonia, Acids and Fertilizers (August 2007)
/BURNERS/	P&I-Flowsheet with instrumentation of the Ammonia burners
/CONTROL/	ISO 9001 document: control and calibration of flow meter
/COR/	ISO 9001 document: control and calibration of HNO_3-density meter
/CAT/	Technical information about HEREAUS N_2O-Catalyst Catalyst installation documentation
/CGC/	Calibration gas certificates for the AMS, all in period of validity

Reference	Document
/DENS/	Technical description of the Bopp & Reuther density meter
/EIA/	Email from the DFP regarding Environmental Impact Assessment
/EMISS/	ISO 9001 documents/procedures of the emission determination
/EQUIP/	ISO 9001 document: list of relevant instruments for product characterisation
/FINETECH/	FINETECH technical and financial proposal of the AMS Order for analyser Configuration of analyser
/FICHE/	Control chart and calibration check Specification for instrumentation "Fiche de Vie", control card
/FLOW/	Technical description of the KROHNE Nitric Acid flow meter
/FSTRIP/	Principle P&I-Flowsheet with trip-points measurement-instrumentation and tag-numbers
/GASMET/	Technical description Gasmet analyser/ Handbook DX-4000
/HERAEUS/	Heraeus technical proposal of abatement catalyst
/HERAEUS1/	Heraeus commercial proposal of abatement catalyst INVOICE from HERAEUS March2011-May2011
/HIS/	AMS implementation history
/INSTALL/	Technical drawings regarding the installation of the catalyst basket/catalyst
/ITABAR/	Diff pressure calculation for stack gas flow measurement (taking into account stack diameter)
/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 2010-06-21, Ref-No.: 1D10011529 ;

Reference	Document
	• 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 2011-10-11, Ref-No.: 11-1064 5E ; • Authorization letter 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 2011-11-10, Ref-No.: 11-1064 5E DNbis to authorise Total Petrochemicals Antwerpen to participate in the project activity. • Investor country LoA issued by the Belgian « National Climate Commission » on 2011-04-04, Ref-No.: NKC/FP/5 issued to GPN S.A;
/MR/	• First and published Monitoring report of GHGs emission reductions (Track1) (18.04.2010 – 31.08.2011) ""GPN Grandpuits N2O abatement project" Track 1" dated 2012-06-01 issued by N.serve (version 1). • Final Monitoring report of GHGs emission reductions (Track1) (18.04.2010 – 31.08.2011) ""GPN Grandpuits N2O abatement project" Track 1" dated 2012-10-24 issued by N.serve (version 2).
/NH3AIR/	P&I-Flowsheet with instrumentation of the Ammonia/Air input
/ORGA/	General overview of the company organization
/PI/	Screenshot of the PI-system –Ammonia/Air-ratio setting and display of current level
/PLAN/	Plant map
QAL1	QAL 1 report for Gasmet analyser issued by TÜV Rheinland 93621200448/A
QAL2	QAL 2 report issued by Müller BBM, Report No.M84 932/1 (2011-12-09)
/STACK/	Technical drawing stack diameter
/TRIP/	Trip point parameters, listed in a plant-safety document

Reference	Document
/XLS/	Emission reduction calculation: Draft: 20110926_ER_grandpuits_v01.xlsx Final: 20110926_ER_grandpuits_v12.xlsx

Table 7-2: Background investigation and assessment documents

Reference	Document
/AFNOR/	AFNOR (02/2003), BP X 30 331, Protocole de quantification des émissions de protoxyde d'azote dans la fabrication d'acide nitrique
/AM0034/	Approved CDM Methodology AM0034, version 03.4: "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants
/BREF/	Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals – Ammonia, Acids and Fertilizers (August 2007)
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/DET/	*Determination Report for JI project, GPN GRANDPUITS N2O ABATEMENT PROJECT, Report No: : 8000376788 – 09/444* *Date: 2010-06-24, issued by TÜV NORD*
/DVM/	JI Determination and Verification Manual
/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 for JI project: *GPN GRANDPUITS N2O ABATEMENT PROJECT,* Date: 19th January 2010, Version: 04

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)
/cdm/	http://cdm.unfccc.int/Reference/tools/index.html	Web page of the UNFCCC
/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 (French DFP)
/douane/	http://www.douane.gouv.fr/data/file/6146.pdf	Web-file regarding N_2O emission taxation.
/dehst/	http://www.dehst.de	German Emissions Trading Authority (DEHSt) at the Federal Environment Agency
/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)
/efma/	www.efma.org	Web page of the European Fertilizer Manufacturers Association
/eu/	http://ec.europa.eu/environment/climat/emission/implementation_en.htm	EC legal database

Reference	Link	Organisation
/ipcc/	http://www.ipcc.ch/publications_and_data/publications_and_data.shtml	IPCC publications
/ji/	http://ji.unfccc.int	UNFCCC JI-website with relevant JI related documents/guidances
/jir/	http://www.jirulebook.org/track1	JI-Rulebook, Practice and Procedures

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Bertrand Walle	GPN, Operational manager
/IM01/	V	☒ Mr. ☐ Ms	Simon Declaire	GPN, Production Engineer
/IM01/	V	☒ Mr. ☐ Ms	Vianney Robert	GPN, Process Engineer
/IM01/	V	☒ Mr. ☐ Ms	Benjamin Lefebre	GPN, Technician for analyser
/IM01/	V	☒ Mr. ☐ Ms	N. Rodriges	Energy manager
/IM02/	V	☐ Mr. ☒ Ms	Sarah Debor	N.serve, Project manager
/IM02/	V	☒ Mr. ☐ Ms	Wolfgang Brückner	N.serve, Project manager

[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., lab) • 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 Verfication Checklist

No.	DVM[4] 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 letters of approval from the investor countries (Germany, Belgium) are still pending (CAR A1). • This is the 1st verification and no report was issued prior to this verification • The report will be submitted directly to the DFP by the PP because it is a track 1 project. *Means of determination:* DFP-website, LoA, Unfccc-website, MR *Conclusion:* CAR A1: Clarification is requested if Belgium and Germany are considered as involved parties. LoAs of investor counties are still pending. The investor LoAs should be provided to IAE.	/LOA/ /dfp/ /unfccc/	~~CAR A1~~	OK	OK
A.2	*DVM § 91* Are all the written project	*Description:* The French LoA has two conditions, which need to be taken into account:	/LOA/ /PDD/	OK		OK

[4] JISC 19 Annex 4

No.	DVM[4] 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
	approvals by Parties involved unconditional?	• Only 90 % of the verified emission reductions of one period shall be claimed by the PP. The ERU quantity stated in this report already takes into account the 10% deduction. • The total amount of verified emission reductions until 2012-12-31 is limited to 296,047 tonnes (before 10 % reduction) *Means of determination:* By checking the host country LoA *Conclusion:* OK, the calculation of the ERUs by PP has been done in compliance with the LoA conditions. • 10 % of the emission reductions are subtracted from the initial result. The ERU quantity stated in this report already takes into account the 10% deduction. • The sum of emission reduction does not exceed the maximum amount. FAR A3 was raised to compare the verified amount of ERUs with the limit defined in the LoA.	/MR/			
B	***Project implementation***					
B.1	*DVM § 92*	*Description:* The project's installations (abatement catalyst and AMS instrumentation) were checked by the verification	/PDD/	~~CAR C4~~	OK	OK

No.	DVM[4] 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?	team and compared with the description given in the registered PDD. The installation of the abatement catalyst is full in line with the description given in the PDD. It is evidenced that the abatement system was in place and running for the entire period. The Heraeus secondary catalyst system was positioned below the standard precious metal gauze packs in the four ammonia burners. Due to initial problems with the implementation commissioning and processing of the Automated Monitoring System (AMS) and the delayed order/implementation of the final analyser following temporary deviations to the planned situation as per PDD has been observed: During the first months of this verification period the data storage capacity did not suffice to store the raw data of hourly mean value and every 5-sec value for more than 6 month. Some inevitably lost from data management system for time period from 18/04/2010 to 25/10/2010 has been occurred. For the time period from 01/05/2010 to 30/06/2010 and 25/10/2011 to 31/10/2011 only hourly mean values has been stored and every 5-sec values have been lost. Therefore emission reduction calculation is only based on the hourly averages. The verifier couldn't crosscheck the calculated hourly mean values with original measured every	/MR/ /CAT/ /PLAN/ /PURCH/ /AMS-INST/ /HIST/ /IM01/	~~CL B1~~ ~~CL B2~~		

No.	DVM[4] 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
		5-sec values for the time periods in which the data management system stored only hourly values. Due the delayed availability of the planed project N_2O-analyser a temporary analyser was used to measure the N_2O concentration NCSG in stack gas in the period May until June 2010. The PP applied a portable QAL1 certified Gasmet DX- 4000 Multi-Gas analyser (Gasmet Technologies). It is evidenced that the analyser was proper calibrated under QAL3 procedures but a QAL2 test was not performed. The temporary analyser has been replaced by a Finetech FTIR Orbital AIT Anafin 5000 analyzer in July 2010 and NCSG data were available from 25/10/2010 until the end of the verification period. The analyser was proper calibrated under QAL3 procedures but a QAL2 test was not performed yet. Furthermore the analyser is not QAL1 approved for N_2O. Therefore a QAL2 shall be conducted on this analyzer to confirm its suitability. Stack gas flow measurement (Yokogawa meter, BF-35-ID1100/9mm-S-SM-C01-0-0-0-0-X180-HL-T0-A15-A71)was implemented but had malfunction and could be put in operation in May 2011. First correct VSG values from the stack gas flow meter were measured and recorded after 01/06/2011. Since all VSG measurements have been				

No.	DVM[4] 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
		delivered by the flow meter. Erroneous measurements before had not been suitable for the purpose for the calculation of Emission Reductions. Therefore for all values generated before 01/06/2011 the PP used two approach based on a gas mass balance taking the primary air, secondary air and tertiary air and in one approach additional the concentration of O_2 in stack gas into account. *Means of determination:* PDD, MR, on-site visit, documents and certificates provided by the PP, *Conclusion:* The following findings have been raised: CAR C4: The PP should evidence the appropriateness of the AMS with regard to e.g. location of the sampling point, QAL2 and uncertainty assessment. Installation and commissioning protocols of the AMS shall be provided. CL B1: A further detailed description of the implementation of the AMS (analyser, stack flow meter, data acquisition system) with key events regarding purchase order, installation, implementation, commissioning, issues, delayed QAL2 test shall be included in the Monitoring Report (and/or listed as a supporting document) and evidenced with related correspondence. CL B2: The justification on the concentration gradient of N_2O in				

No.	DVM[4] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		the stack gas during the Monitoring Period shall be further elaborated. The exchange and refill of secondary N_2O abatement catalyst shall be also specified in MR.				
B.2	*DVM § 93* What is the status of operation of the project during the monitoring period?	*Description:* The project (destruction of N_2O) is running according to the description provided in the PDD. Some unexpected situations appeared which are business as usual failures and correctly noted in the report. *Means of determination:* Calculation sheets annexed to the 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 reasonable. The verification team found some need for clarification and inconsistencies in the MR and raised the following findings: CL B1: A further detailed description of the implementation of the AMS (analyser, stack flow meter, data acquisition system) with key events regarding purchase order, installation, implementation, commissioning, issues, delayed QAL2 test shall be included in the Monitoring Report (and/or listed as a supporting document) and evidenced with related correspondence.	/PDD/ /MR/ /XLS/ /EMISS/ /INSTALL/ /IM01/ /HIST/	~~CL B1~~ ~~CL B2~~	OK	OK

No.	DVM[4] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		CL B2: The justification on the concentration gradient of N_2O in the stack gas during the Monitoring Period shall be further elaborated. The exchange and refill of secondary N_2O abatement catalyst shall be also specified in MR.				
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 parameters and parameters used for calculation are: • $NCSG_n$ [mg N_2O/Nm^3] monitored • VSG_n [Nm^3/h] monitored • PE_n [kgN2O] calculated • OH_n [h] monitored • NAP_n [$tHNO_3$] monitored • EF_{BM} [$kgN_2O/tHNO_3$] used for calculation • GWP_{N2O} [tCO_2e/tN_2O] used for calculation • ERU [ERUs (tCO_2e)] calculated • TSG [°C] monitored • PSG [Pa] monitored	/PDD/ /MR/ /XLS/ /IM01/ /HIST/ /14181/	~~CAR C1~~ ~~CL C2~~ ~~CL C3~~ ~~CAR C4~~ ~~FAR C5~~ ~~CL C6~~	OK	OK

No.	DVM[4] 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
		• EF_n $[kgN_2O/tHNO_3]$ calculated The PP refers to the project methodology and European standard 14181 regarding implementation of monitoring equipment and procedures. Furthermore some VSG data was determined according AFNOR (02/2003), BP X 30 331, Protocole de quantification des émissions de protoxyde d'azote dans la fabrication d'acide nitrique . Due to initial problems with the implementation commissioning and processing of the Automated Monitoring System (AMS) and the delayed order/implementation of the final analyser following deviations to the planned situation as per PDD has been observed: 1) Data management 2) N_2O concentration measurement 3) Stack gas flow measurement *Means of determination:* Project documentation, MR, on-site				

No.	DVM[4] 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
		inspections and interviews and the approved monitoring plan. Further DIN EN 14181, applied methodology, quality related procedures provided by the plant staff. *Conclusion:* Findings were raised related to inconsistencies and deviations: CAR C1: During onsite visit it has been identified that the TRIP values as indicated in MR and PDD are inconsistent to the plants implemented values. TRIP points should be mentioned according to the values applied in the safety procedures. CL C2: Clarification is requested on the "real" measurement frequency for all relevant parameters. CL C3: The cross check procedures of measured NAP with the official production figures should be described in detail. CAR C4: The PP should evidence the appropriateness of the AMS with regard to e.g. location of the sampling point, QAL2 and uncertainty assessment. Installation and commissioning protocols of the AMS shall be provided. FAR C5: The verifier of the next period shall check the correctness of AMS-parameterisation (e.g. QAL2 parameter, stack diameter, moisture, uncertainty). CL C6: Mass balance used for tail gas flow calculation during the time as non volume flow meter was in operation. • The equipment with which primary and secondary airflow is measured should be listed in the MR.				

No.	DVM[4] 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
		• Clarification is requested on the determination of O_2 in the stack flow which is used in the VSG calculation. The calculation method of VSG and the used parameter O_2, (normalized) primary, secondary and tertiary airflow should be explained in detail in the MR.				
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 in the methodology EF_{BM} which was issued by the French DFP. Default values are expressed in benchmark values: Year: 2009 2010 2011 2012 Value EF_{BM}: 2.5 2.5 2.5 1.85 [kg N_2O/t HNO_3] These benchmark values are the key factors, which influence the baseline scenario and reduce 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 GPN plant staff	/PDD/ /LOA/ /DET/ /IM01/ /IM02/	N/A		OK

No.	DVM[4] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		Conclusion: The benchmark values are correctly considered in the calculation of baseline emissions and take into account the sectoral reform policies and legislation (point 23 (b) (i) of DVM). The verification team can confirm, that the result of risk assessment (risks associated with the project) was taken into account.				
C.3	*DVM § 95b)* Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	*Description:* Parameters and related data sources are: • PE_n [kgN_2O] Calculation from measured data • OH_n [h] Production Log – taking into account: plant status signal based onNH_3 valve status signal and trip point parameters • EF_{BM} [$kgN_2O/tHNO_3$] Determined according to French Government Decision and LoA • GWP_{N2O} [tCO_2e/tN_2O]	/PDD/ /MR/ /DET/ /XLS/ /TRIP/ /IM01/ /LOG/	~~CL C6~~ ~~CAR D6~~	OK	OK

<table>
<tr><th>No.</th><th>DVM[4] paragraph / Checklist Item
(incl. guidance for the determination team)</th><th>Initial Finding
(Means and results of assessment)</th><th>Ref.</th><th>Action requested to PPs
(CAR, CL, FAR)</th><th>Review of PP´s action</th><th>Con-clu-sion</th></tr>
<tr><td></td><td></td><td>
Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22.
• ERU [ERUs (tCO_2e)]
Calculated from measured data
• E_{Fn} [$kg_{N2}O/kgHN_{O3}$]
Calculated from measured data
Measured parameter, stored and calculated in DCS:
<table>
<tr><th>parameter</th><th>TAG</th><th>Device Description (Supplier + Type)</th></tr>
<tr><td>VSG</td><td>FI 2206</td><td>Yokogawa IBF-35-ID1100/9mm-S-SM-C01-0-0-0-0-X180-HL-T0-A15-A71</td></tr>
<tr><td>NCSG</td><td>AI 2206</td><td>FINETECH
FTIR Orbital AIT
Anafin 5000</td></tr>
</table>
</td><td></td><td></td><td></td><td></td></tr>
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No.	DVM[4] 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
		NAP flow	FI 2115	KROHNE Electromagnetic IFM 4080				
		NAP (Conc.)	C 2115	BOPP & REUTHER DIMF 2.0 TVS				
		NAP (Temp.)	TI 2185-5	Thermocouple K Type				
		Primary air 1	FI 2125 A	Rosemount 1151 DP3 Differential pressure				
		Secondary air 2	FI 2126	Rosemount 3051 CD1 A02A1 Differential pressure				
		PSG	PI 2206	Rosemount Type 3051 CD1A-02				
		TSG	TI 2206	Endress+Hauser TR13 PT 100				
		AFR	F 2125B	Rosemount 1151DP 5 E22				
		O2	AI_2206_	Setnag oxygen analyzer				

No.	DVM[4] 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
		<table><tr><td></td><td>O2</td><td></td></tr></table> *Means of determination:* check of PDD, methodology, monitoring report; during on-site plant visit check of PCS and data server. *Conclusion:* Following findings have been raised: <u>CL C6:</u> Mass balance used for tail gas flow calculation during the time as non volume flow meter was in operation. • The equipment with which primary and secondary airflow is measured should be listed in the MR. • Clarification is requested on the determination of O_2 in the stack flow which is used in the VSG calculation. The calculation method of VSG and the used parameter O_2, (normalized) primary, secondary and tertiary airflow should be explained in detail in the MR. <u>CAR D6:</u> Following issues w.r.t. emission reduction calculation have been identified and subsequent clarification is requested: • No correction factor according QAL2 is used in the ER calculation. • For several hours the raw data are missing • For several hours data are missing in the ER calculation. • The trip point of 920°C should be used for determination of OH for ER calculation.				

No.	DVM[4] paragraph / Checklist Item (incl. guidance for the determination team)	Initial Finding (Means and results of assessment)	Ref.	Action requested to PPs (CAR, CL, FAR)	Review of PP´s action	Con-clu-sion
		The extra hour at 2010-10-31 (summer - winter time change) should be taken into account for emission calculation in the Excel-file of the monitoring data. Also the winter-summer time change at 2011-03-04 should be taken into account.				
C.4	*DVM § 95c)* Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	*Description:* As described under C.2., the French DFP sets emission factors as benchmark values. *Means of determination:* Determined PDD. *Conclusion:* The benchmark values, as set by the French DFP, were correctly included in emission reduction calculation.	/PDD/ /DET/	N/A		OK
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 project baseline is set by default values in the methodology EF_{BM} which was issued by the French DFP. Default values are expressed in benchmark values: Year: 2009 2010 2011 2012 Value EF_{BM}: 2.5 2.5 2.5 1.85 [kg N_2O/t HNO_3] These benchmark values are the key factors, which	/METH/ /LOA/ /AP/	OK		OK

No.	DVM[4] 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
		influence the baseline scenario and reduce the accountable emission reductions from realistic baseline emissions to the above mentioned values. *Means of determination:* French methodology, LoA, interviews GPN plant staff *Conclusion:* The benchmark values are correctly considered in the calculation of baseline emissions and take into account the sectoral reform policies and legislation (point 23 (b) (i) of DVM). The verification team can confirm, that the result of risk assessment (risks associated with the project) was taken into account.				
	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	Estimation of total emissions reductions over the crediting period until 31.12.2012 (after the 10% deduction) are: 296,047 (tonnes of CO_2e) according to the LOA. *Means of determination:* PDD and LoA *Conclusion:* The average ERUs per year obviously exceed the threshold value of 60,000 t CO_{2e} per year; the project is classified as large-scale project.	/LOA/ /PDD/	N/A		

No.	DVM[4] 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
	PDD for the JI SSC project or the bundle for the monitoring period determined?					
	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:* *Conclusion:*				
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:* *Conclusion:*				
C.9	*DVM § 98* 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	*Description:* N/A *Means of determination:* *Conclusion:*				

No.	DVM[4] 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
	report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?					
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:* *Conclusion:*				
D.2	*DVM § 99b)* Does 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 for the establishment of monitoring plans?	*Description:* N/A *Means of determination:* *Conclusion:*				

No.	DVM[4] 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
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:* During a couple of month in this monitoring period the DCS and data storage system were not operating as planned; malfunctions happened and several data which have been collected were lost by capacity limits of the data storage system. In principle the data collection is in accordance with the monitoring plan. The monitoring system measures every 5 seconds and reports hourly averages for all the monitored parameters to N.serve, who is responsible for the correct analysis of the delivered data. For all N_2O data sets a plausibility check is conducted. All data sets containing implausible values are eliminated from the calculation of the average values. Implausible values are those which are negative or clearly out of the range of "normal operating conditions". *Means of determination:* The original excel file produced by the data adquisition system sent to N.serve by the plant operator has been checked together with the final ER calculations accounted as per the applied methodology and determined PDD. Conclusion: after the deviation caused by the malfunction of DCS and delayed implementation of analyser it has been	/PDD/ /MR/ /XLS/ /RAWDATA/ /IM01/ /IM02/	~~CAR C4~~ FAR C5	OK	OK FAR C5

No.	DVM[4] 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
		confirmed that the data collection procedures are as per the description in the determined monitoring plan. Findings were raised: CAR C4: The PP should evidence the appropriateness of the AMS with regard to e.g. location of the sampling point, QAL2 and uncertainty assessment. Installation and commissioning protocols of the AMS shall be provided. FAR C5: The verifier of the next period shall check the correctness of AMS-parameterisation (e.g. QAL2 parameter, stack diameter, moisture, uncertainty).				
E.2	*DVM § 101b)* Is the functioning of the monitoring equipment, including its calibration status, in order?	*Description:* All relevant monitoring instruments incl. the AMS are included in the quality procedures which are established for proper operation of the plant. *AMS:* Additional measures are related to the European Norm EN14181 (2004) "Stationary source emissions - Quality assurance of automated measuring systems": QAL 1: performance approval: the AMS is suitable for purpose and in line with the European norm. QAL 2: **a QAL2 audit was not yet performed.** QAL 3 (ongoing operation and maintenance) *N_2O-Analyzer Zero Calibration* is conducted automatically every 24 hours.	/MR/ /PDD/ /AMS-CHK/ /AMS-INST/ /AMS_CAL/ /CAT/ /	~~CAR C1~~ ~~CL C2~~ ~~CAR C4~~ ~~CL C6~~ FAR C5	OK	FAR C5 OK

No.	DVM[4] 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
		Manual calibrations were done at least once per month. Manual span calibrations are done with certified calibration gas and the calibration results are all documented as part of the QAL3 documentation. Due the delayed availability of the planed project N_2O-analyser a temporary analyser was used to measure NCSG in the period May until June 2010. The PP used a portable QAL1 certified Gasmet DX- 4000 Multi-Gas analyser. The verifier concludes that the used analyser was during the applied period proper calibrated und QAL3 and suitable for the purpose. Nevertheless a QAL2 test was not performed. From 25/10/2010 until the end of the verification period the Finetech FTIR Orbital AIT Anafin 5000 hot extractive analyzer (not QAL1 approved) was used to determine N_2O concentrations. The verifier concludes that the instrument was during its use proper QAL3 calibrated. But the suitability and accuracy of the Finetech analyser was not proven during a QAL2 test. The project stack gas flow meter (Yokogawa meter, BF-35-ID1100/9mm-S-SM-C01-0-0-0-0-X180-HL-T0-A15-A71) could be put in operation before May 2011. The suitability and accuracy of the flow meter was also not proven during a	/CAL / /9001/ /CGC/ /LAB/ /QAL1/ /QAL2/ /QAL2INST/ /IM01/ /IM02/			

No.	DVM[4] 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
		QAL2 test. *a) Other monitoring installations, equipment and devices:* Other instruments involved in the monitoring of the project were functional and proper calibrated. Operation maintenance and calibration intervals are carried out by qualified and trained staff from the instrument department according to the vendor´s specification. Activities are controlled and documented as part of the quality assurance programme. *Means of determination:* Calibration procedures, instrument and calibration documentation, calibration results and the monitoring system log have been checked with the plant operator during the on-site visit. *Conclusion:* The PP implemented a quality assurance system to prove the ongoing compliance of the AMS with the norm. The most maintenance activities are monitored and controlled as part of quality assurance programme. Nevertheless the following findings have been raised: CL C6: The cross check procedures of measured NAP with the official production figures should be described in detail. CAR C1: During onsite visit it has been identified that the TRIP				

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		values as indicated in MR and PDD are inconsistent to the plants implemented values. TRIP points should be mentioned according to the values applied in the safety procedures. CL C2: Clarification is requested on the "real" measurement frequency for all relevant parameters. CAR C4: The PP should evidence the appropriateness of the AMS with regard to e.g. location of the sampling point, QAL2 and uncertainty assessment. Installation and commissioning protocols of the AMS shall be provided. FAR C5: The verifier of the next period shall check the correctness of AMS-parameterisation (e.g. QAL2 parameter, stack diameter, moisture, uncertainty). CL C6: Mass balance used for tail gas flow calculation during the time as non volume flow meter was in operation. • The equipment with which primary and secondary airflow is measured should be listed in the MR. • Clarification is requested on the determination of O_2 in the stack flow which is used in the VSG calculation. The calculation method of VSG and the used parameter O_2,				

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		(normalized) primary, secondary and tertiary airflow should be explained in detail in the MR.				
E.3	*DVM § 101c)* Are the evidence and records used for the monitoring maintained in a traceable manner?	*Description:* The nitric acid plant is equipped with an automatic data collection and storage system 'OSI Plant Information', which records and stores all monitoring values for NCSG, VSG, TSG, PSG, as well as different status signals of the AMS and the ammonia (NH_3) valve status signal from the nitric acid plant that defines whether or not the plant is in operation. All monitoring data are collected by the DCS on a 5-second basis. The system automatically calculates hourly mean values which are exported to excel files to be finally reported to N.serve. Now the plant operator makes use of an external server in order to save the raw and hourly recorded measurements for all the monitoring parameters produced by the DCS. These data can be retrieved at any time by the plant operator. Nevertheless during the first months of this verification period the data storage had problems and malfunction during storage. Therefore, raw data of every 5-sec values and some hourly mean values have been inevitably lost For some time period only hourly mean values has been stored and every 5-sec values have been lost. For some hourly values the verifier couldn't crosscheck with original data.	/XLS/ /IM01/ /IM02/ /SERVCONF/ /RAWDATA/	FAR F1		FAR F1

No.	DVM[4] 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: Some original spreadsheets created by the DCS have been checked and the functioning of DCS was checked during the on-site visit (spot-check of single hours and days). *Conclusion:* FAR F1 A procedure to backup the raw monitoring data could not be evidenced during the onsite visit. This procedure should be checked in the 2nd Verification.				
E.4	*DVM § 101d)* Is the data collection and management system for the project in accordance with the monitoring plan?	*Description:* The data collection and the management system 'OSI Plant Information' are conducted as per the description in the determined monitoring plan. The data acquisition system records also the hourly average data which is sent to N.serve for the quality and plausibility check, statistical analysis and final emission reduction calculation. *Means of determination:* by means of interview with the plant operator and N.serve representatives. *Conclusion:* FAR F1: A procedure to backup the raw monitoring data could not be evidenced during the onsite visit. This procedure should be checked in the 2nd Verification.	/PDD/ /MR/ /XLS/ /IM01/ /IM02/ /AMS-CHK/ /AMS-INST/ /AMS_CAL/	FAR F1		FAR F1