Verification and certification report form for CDM project activities

(Version 02.1)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title and UNFCCC reference number of the project activity	N2O abatement project at nitric acid plant No. 11 at African Explosives Ltd. (AEL), South Africa UNFCCC ID: 1364
Version number of the verification and certification report	1.0
Completion date of the verification and certification report	13/04/2018
Monitoring period number and duration of this monitoring period	MP 10 18/08/2016 to 07/02/2018 (including both days)
Version number of the monitoring report to which this report applies	4.0
Crediting period of the project activity corresponding to this monitoring period	08/02/2008 to 07/02/2018 (including both days)
Project participants	AEL Mining Services Limited N.serve Environmental Services GmbH Nordic Environment Finance Corporation
Host Party	South Africa
Applied methodologies and standardized baselines	CDM Methodology: AM0034 ver. 2 - Catalytic reduction of N2O inside the ammonia burner of nitric acid plants
Mandatory sectoral scopes linked to the applied methodologies	Scope: 5 / Technical Area: 5.2
Conditional sectoral scope(s) linked to the applied methodologies	Scope: n.a. / Technical Area: n.a.
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	392,008 t CO_{2e}
Certified amount of GHG emission reductions or GHG removals for this monitoring period	271,793 t CO_{2e}
Name and UNFCCC reference number of the DOE	TÜV NORD CERT GmbH; E-0022

Name, position and signature of the approver of the verification and certification report	Rainer Winter Final Approver

SECTION A. Executive summary

AEL Mining Services Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out this periodic verification of the project:

"N2O abatement project at nitric acid plant No. 11 at African Explosives Ltd. (AEL), South Africa"

with regard to the relevant requirements for CDM project activities.

This verification covers the period as indicated on the title page.

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

Details of the project location are given in table A-1 below:

Table A-1: Project Location

No.	Project Location
Host Country	South Africa
Region:	Gauteng / Modderfontain
Project location address:	PO Modderfontein 1645, Johannesburg
Latitude:	26°05'50'' South
Longitude:	28°10'26'' East

Basic technical details of the project are summarized in table A-2.

Table - A-2: Technical data of the project activity

Parameter	Unit	Value
Design capacity	100% $tHNO_3/a$	282,875 (775 metric tonnes per day with 365 operating days per year).
OT_{normal}	°C	820 – 905
OP_{normal}	kPa (gauge)	365 - 450
AFR_{max}	tNH_3/h	9.094
$AIFR_{max}$	%	11.5
CL_{normal}	$tHNO_3$	127,302.4
CL_{BL}	$tHNO_3$	134,700
GS_{normal} (Gauze supplier for the campaigns under this monitoring period)	-	W.C Heraeus
GC_{normal} (Gauze composition for the campaigns under this monitoring period)	%	Platinum (Pt) 56 Rhodium (Rh) 4 Palladium (Pd) 40

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 validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology(ies),

- 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 this periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	IR	Winter	Stefan	TÜV NORD CERT GmbH	X	X	X	X
2.	Verifier	EI	Kochaniewicz	Gregor	-	X	X	X	X

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer				
2.	Technical reviewer	IR	Winter	Rainer	TÜV NORD CERT GmbH
3.	Approver	IR	Winter	Rainer	TÜV NORD CERT GmbH

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

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.

Materiality Threshold
The verification is based on the materiality threshold identified in table C-1 below:

Table C-1: Applied Materiality Threshold

	Threshold	Related to
☐	**0.5 %**	**Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year[1];**

[1] A year refers to a period of 12 consecutive months.

	Threshold	Related to
☐	1 %	**Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;**
☒	2 %	**Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;**
☐	5 %	**Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;**
☐	10 %	**Emission reductions or removals for the type of registered CDM project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).**

Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	*Installation of monitoring equipment*	*Low*	*Wrong installation of monitoring equipment might lead to wrong results*	*Check of monitoring equipment, esp. with regards to appropriateness of the location*
2.	*Dysfunction of installed equipment*	*Medium*	*Dysfunction of equipment might lead to wrong measuring results*	*Check of operational data*
3.	*Exchange of measurement equipment*	*Medium*	*Exchange of measure-ment equipment might lead to incorrect data processing*	*Check of serial-numbers of installed measurement equipment*
4.	*Wrong or insufficient quality assurance of monitoring equipment*	*High*	*Wrong or insufficient QA/QC might lead to incorrect monitoring results*	*Check of* - *calibration intervals* - *calibration certificates* - *QAL 2 report* - *QAL 3 records* *Qualification records of involved entities and personnel*
5.	*Mismatch or wrong implementation of formulae and algorithms*	*Medium*	*It has to be ensured that e.g. calibration functions are correctly implemented*	*Check of data aggregation trails, spreadsheet programming, IT Systems etc.*
6.	*Incomplete data*	*Medium*	*Data gaps shall be addressed in line with applicable rules*	*The completeness of data was checked in detail during the on-site visit. Further crosschecking was done to ensure data quality.*

7.	*Mistakes in data transfer*	*Medium*	*The likeliness of data transfer mistakes is considered low where automatic procedures are applied and high where manual aggregation is required.*	*Check of* - *Data aggregation trails* - *IT systems* - *Spreadsheet programming* - *Data protection measures responsibilities*
8.	*Wrong usage of emission factors, coefficients etc.*	*Low*	*Such factors may not be applicable for current conditions*	*Check of relevant parameters, e.g. GWP, molecular masses etc.*

On the basis of the risk analysis the verification has been planned. A detailed audit/verification plan has been prepared and submitted to the project participant(s) in due time before the onsite inspection.

C.2. Consideration of materiality in conducting the verification

Based on the verification planning the verification has been carried out. The concept of materiality has been considered. A breakdown of the chosen approaches is included in the following table.

Parameter	Approach+	Errors* detected	Findings reference	Correc-ted	Remaining verification risk
NCSG	COM	☒	CAR E.6.2.1 FAR 01	☒	Not material
VSG	COM	☒	CAR E.8.1	☒	Not material
PE_n	CDC	☐	-	☐	Not material
OH_n	CDC	☐	-	☐	Not material
NAP	CDC	☒	CAR E.6.2.1 CAR E.6.2.2	☒	Not material
TSG	COM	☐	-	☐	Not material
PSG	COM	☐	-	☐	Not material
EF_n	CDC	☐	-	☐	Not material
$EF_{ma,n}$	CDC	☐	-	☐	Not material
EF_p	CDC	☐	-	☐	Not material
EF_{min}	CDC	☐	-	☐	Not material
EF_{reg}	CDC	☐	-	☐	Not material
CL_n	CDC	☐	-	☐	Not material
OP_h	COM	☐	-	☐	Not material
OT_h	COM	☐	-	☐	Not material
AFR	COM	☐	-	☐	Not material
AIFR	COM	☐	-	☐	Not material
$GS_{project}$	CDC	☐	-	☐	Not material
$GC_{project}$	CDC	☐	-	☐	Not material
Aggregate	-				Materiality threshold not exceeded

*) incl. omissions and misstatements

+) Verification Approaches:

CDC: Complete data check of data including all data aggregation steps
NDC: Non-complete data check – omissions not material
SPL: Sampling approach (all data available)
ASP: Acceptance Sampling
COM: Data check at higher data aggregation levels and sampling at original data levels

The verification was basically carried out as per the verification plan. However, based on the actual situation on-site and the errors, omissions and misstatements identified during the verification minor deviations from the original plan occurred. However, due to the insignificance no major revision of the overall plan was required. Esp. there was no need for significant modification of the sampling approaches or for additional / less locations to be visited during the on-site.

SECTION D. Means of verification

D.1. Desk/document 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:

- the last revision of the PDD including the monitoring plan/PDD/,
- the last revision of the validation report/VAL/,
- documentation of previous verifications/VER/
- 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 website and background information were also reviewed.

D.2. On-site inspection

Duration of on-site inspection: 01/03/2018 to 02/03/2017				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	**Opening Meeting:** • Introduction of participants; • Detailed audit planning; • Induction by the plant	AEL Mining Ltd	01/03/2018	Stefan Winter, Gregor Kochaniewicz
2.	Check of operation and management changes, with regards to application of new methodology	AEL Mining Ltd		

3.	• Plant performance and update on recent changes and QA/QC measures:
	• Changes of
	  • Technical Setup
	  • Instrumentation
	  • Personnel / Responsibilities
	• Plant performance
	  • Shut-downs,
	  • Gauze changes
	  • Problems
	• QAL2 measurements
	• Other calibrations
		AEL Mining Ltd		

4.	**Preparation of site visit:** • PPE etc. • P&I diagrams • Technical Specifications	AEL Mining Ltd		
5.	**Site/Plant Visit:** • Control room • Analyzer cabinet • Field equipment • Laboratory	AEL Mining Ltd		
6.	**Data analysis and calculation:** • Raw data analysis • Check of DCS programming • Check of ER calculation • Counter calculation	AEL Mining Ltd	02/03/2018	
7.	**Check of additional evidences:** • Technical data of the plant • Situation of legislation	AEL Mining Ltd		
8.	**Quality Management System:** • Check of ISO certificates • Calibration procedure • Data storage/Back-up • Data aggregation and processing • Qualification of personnel	AEL Mining Ltd		
9.	**Closing meeting**	AEL Mining Ltd		

D.3. Interviews

No.	**Interviewee**			**Date**	**Subject**	**Team member**
	Last name	**First name**	**Affiliation**			
1.	Burger	Hendrik	AEL	01-02/03/2018	All	Stefan Winter, Gregor Kochaniewicz
2.	Gutknecht-Stöhr	Niko	n.serve	01-02/03/2018	All	
3.	Govender	Dan	AEL	02/03/2018	Training issues	

D.4. Sampling approach

D.4.1 Sampling during monitoring

☒	No sampling approach has been used by the PP to determine the monitored parameters
☐	A sampling approach has been taken for the following monitored parameter(s):

Parameter	Sampling approach [1)]	Sampling Type [2)]	Population	Sample Size

[1)] *Sampling Approaches:*

SiRS: Simple Random Sampling
StRS: Stratified Random Sampling
SS: Systematic Sampling
CS: Cluster Sampling
MSS: Multi-stage Sampling
AS: Acceptance Sampling

[2)] *Sampling Types:*

PS: Parameter Sampling

D.4.2 Sampling approaches during verification

☐	No sampling approach has been used by the VT to verify the monitored parameters
☒	A sampling approach has been applied by the VT for the following monitored parameter(s):

Parameter	Sampling approach [1)]	Sampling Type [2)]	Population	Sample Size
NCSG	SiRS	COM	539 days / hourly data 12,936 / 2s data logging 23,284,800	hourly data 374 / 2s data logging 385
VSG	SiRS	COM		
TSG	SiRS	COM		
PSG	SiRS	COM		
OTh	SiRS	COM		
OPh	SiRS	COM		
AFR	SiRS	COM		
AFIR	SiRS	COM		
NCSG	SiRS	COM		

[1)] *Sampling Approaches:*

SiRS: Simple Random Sampling
StRS: Stratified Random Sampling
SS: Systematic Sampling
CS: Cluster Sampling
MSS: Multi-stage Sampling

[2)] *Sampling Types:*

AS: Acceptance Sampling
PS: Parameter Sampling
COM: Full data check at higher data aggregation levels and sampling at original data levels

A sampling approach has been applied by the verification team to check the data transferred from the AMS to the emission reduction excel calculation spreadsheet. The 2 sec raw data from the

AMS has been checked against the hourly raw data also from AMS as AMS converts data automatically from 2 sec data to hourly aggregated data. Besides the hourly raw data from AMS has been checked against the hourly data used in ER calculation spreadsheet to determine the related emission reductions. Further the monthly summary sheets used by AEL to control the plant operation have been crosschecked with hourly data as well and used as crosscheck for the ER calculation spreadsheet. Randomly selected time periods (hours and days) have been checked to confirm the correctness of the data transfer. The amount of data to be checked has been derived applying random sampling 95% confidence interval, 5% margin of error and 50% response distribution. For the calculation of the sample size the software http://www.raosoft.com/samplesize.html has been used.

Based on that the following sampling has been conducted:

Parameter	Population size	Required sample size	Number of samples checked
Hourly data for OTh, OPh, AFR, AFIR, NCSG, VSG, PSG and TSG	12,936 (539 days x 24 h/d)	374	2 months = 1440 hours
2 sec raw data for OTh, OPh, AFR, AFIR, NCSG, VSG, PSG and TSG	23,284,800 (539 days x 24 h/d x 3,600 s/h / 2)	385	500

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	1	-
Compliance of the project implementation and operation with the registered PDD	-	1	-
Post-registration changes	-	-	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	2	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	1*
Assessment of data and calculation of emission reductions or net removals	-	1	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	**0**	**5**	**1**

***FAR from previous verification**

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received. By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-MR-FORM has been used. Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.

	The following sources of information have been used in this context: • /MR/ • /MRT/ • /unfccc/	
Findings	☒	The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	☐	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	☒	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
		CAR E.1
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	

E.2. Remaining forward action requests from validation and/or previous verifications

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised. Likewise FARs might have been raised in the course of previous verifications.
In the course of this verification the latest version of the PDD /PDD/ and the previous verification report /VER/, where applicable, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

☒	There were no open issues which have been addressed in the latest version of the validation report.
☐	All open issues from the validation have been appropriately addressed in the context of previous verifications.
☐	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
☐	The following issues related to the validation have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) Open issues from previous verifications:

☐	N/A – as this is the first monitoring period for this CDM project activity.
☐	There were no open issues which have been addressed in the previous verification report
☒	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
☐	The following issues related to the previous verification have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

During last verification assessment it has been identified that the gas bottle used for QAL3 tests containing span gas for NO is still the previous bottle with a production date of 24/08/2015 and a stated gas stability of 12 months resulting in 23/08/2016. This is after the end date of this monitoring period. Therefore a FAR is raised during last verification in order to consider that the bottle was still in use during onsite inspection on 23/02/2017. This has been considered during this verification and regulations as per delay of calibration have been applied to all values for N2O concentration, parameter NSCG from 24/08/2016 of the monitoring period until the date when the new bottle was used for the subsequent QAL 3 test which happended on 23/05/2017. However as also the delay of the QAL 2 test occurred during this period the more conservative maximum permissible error (MPE) of the QAL 2 has been applied for the period 24/08/2016 until 23/05/2017.

As per check of the emission reduction spreadsheet the applied QAL 2 MPE is more conservative and leading to less emission reductions than applying the MPE of the gas bottle.
The method has been checked and is in line with related requirements. The MPE has been applied for the entire delayed period as stated above.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	By means of an in-depth review of the PDD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PDD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment. Further is has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied. Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred. Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs. The following sources of information have been used in this context: • /PDD/ • /MR/ • /VVS/ • /XLS/ • /QMS/ • /MTR/ • /INSTR/ • /unfccc/	
Findings	☒	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	☐	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): - N/A
	☒	In this context the following CARs, CLs have been raised: CAR E.3.1 has been raised as the list of downtimes was inconsistent with actual data found during onsite inspection. CAR E.6.2.2
	In case of phased implementation:	
	☒	N/A
	☐	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	☐	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.
	☐	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A or add as appropriate
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.

	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Further it has been identified that the mass flow meter for nitric acid production has been exchanged during shutdown in July 2017. However an identical meter by the same manufacturer, same model, type and accuracy is used.	

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

☒	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
☐	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
☐	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.4.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	During the verification of the current MP no need for corrections has been identified.
☒	The following corrections have been applied:

	1	Issue:	Template - The PDD was copied into the applicable template. This was not marked in track changes. Summary - Version number 1.c to 2 - Inserted completion date - Name change African Explosives Ltd to AEL Mining Services Limited as previously accepted by UNFCCC - Estimated amount of annual average GHG Emission reductions - Addition of Nordic Environment Finance Corporation as project participant as previously accepted by UNFCCC A.4. Parties and project participants - Name change African Explosives Ltd to AEL Mining Services Limited as previously accepted by UNFCCC - Addition of Norway as Party and Nordic Environment Finance Corporation as project participant as previously accepted by UNFCCC - Addition of Switzerland as Party and N.serve Environmental Services GmbH as project participant as previously accepted by UNFCCC Footnote 16: the statement was previously in Annex 6 and is now part of Appendix 5. - Changed tables and data to reflect actual baseline campaign - Changed assumptions in section “Ex-ante calculation of Emission Reductions” B.6.4 Summary of ex ante estimates of emission reductions - Values of table updated B.7.2 Sampling plan - Added “not applicable” to sampling plan as per new template B.8 Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities - Added names of the people responsible by now Section F Approval and authorization - Completed section F as per the new template. Appendix 1 - Updated contact information and added details for new project participant Appendix 5 - Merged former Annex 6 into Appendix 5, point 6
	2	Issue:	
	The PDD has been revised accordingly: (New) version No.: 2 Revision date: 08/07/2016		
	It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.		
	☒ A related post registration change has been submitted prior to the issuance request. The approval has been received on 13/02/2017 via approval number PRC-1364-001. ☐ A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

E.4.3. Change to the start date of the crediting period of the project activity

☒	N/A - as this is not the first verification within the crediting period
☐	The PPs do not intend to change the start date of the crediting period.
☐	As the change in the start date was below the related time period as indicated in PS § 234 and § 235 no prior approval was required but only a notification. This notification has been submitted by the PP without involvement of the DOE. The change and new start date has been checked from the related UNFCCC project webpage.
☐	The PPs intend to change the start date of the crediting period. As the intended change in start date beyond the related time period as indicated in PS § 236 and as per §237 prior approval by the Board is required. For detailed assessment of the change please refer to related PRC validation report. As per assessment in this report the DOE confirms that the change to the start date of the crediting period are in line with the related requirements of the VVS and PS.
☐	The approval to change the start date of the crediting period has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z

E.4.4. Inclusion of a monitoring plan

☒	N/A - as this monitoring plan was part of the registered PDD
☐	In line with PS § 238 and §78 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 78 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
☐	In line with PS § 238 and §78 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other applied standards or tools

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☐	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
☒	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	B.6.2 Data and parameters fixed ex ante - “The South African Bureau of Standards (SABS) is the designated auditor for these standards at AEL. Therefore, all of the monitoring equipment is subjected to the regular “SABS testing loops” as part of the ISO 9001/14001 procedures.” has been deleted as SABS is not always the designated auditor. - Completed tables (mainly added “Purpose of data”) as per new template - Changed “Value(s) applied” to depict the values of the actual baseline for all relevant parameters. - Added to “Additional comment” of B.1 NCSGBC, B.2 VSGBC, B.5 NAPBC, B.6 TSG, B.7 PSG, B.10 AFR, B.12 AIFR, B.16 OTh, B.18 OPh - Source of data: B.5 NAPBC, B.18 OPh - Choice of data: B.8 EFBL, B.9 UNC, B.13 CLBL, B.14 CLnormal, - Unit: B.10 AFR and B.11 AFRmax

			B.7.1 Data and parameters to be monitored - SABS: o Deleted “The South African Bureau of Standards (SABS) is the designated auditor for these standards at AEL. Therefore, all of the monitoring equipment is subjected to the regular “SABS testing loops” as part of the ISO 9001/14001 procedures.” from first paragraph as SABS is not always the designated auditor. o Deleted reference from OHn, TSG, PSG, OPh,OTh, AFR, AIFR, - Completed tables (mainly added “Purpose of data” and “Monitoring frequency”) as per new template
		Status	☐ under approval; ☒ approved
		Appr.date	13/02/2017
		Ref. No.	PRC-1364-001
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.4.6. Changes to the project design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
☐	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref.No.	
☐	During the verification of the current MP no need for a CoPD has been identified. The monitoring		

	plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following CoPD.is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following CoPD for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.4.7. Changes specific to afforestation and reforestation project activities

☒	N/A - as this is no A/R project activity

E.5. Compliance of the registered monitoring plan with the methodology including applicable tools and standardized baselines

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: • /MR/ • /METH/ • /TOOL/ • /unfccc/			
Findings	☒	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)		
	☒	The breakdown of MP accordance of the referenced tools is as follows:		
		1	Title (of the tool)	Tool for demonstration and assessment of additionality
			Version	7.0.0
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A (for MP)
		2	Title (of the tool)	-
			Version	-
			MP compliance	☐ full compliance ☐ findings have been raised ☐ N/A
	☐	The breakdown of MP accordance of the applicable SB is as follows:		
		1	Title (of the SB)	Name of SB
			Version	
			MP compliance	
	☐	In this context the following CARs, CLs, FARs have been raised:		
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be		

		closed out. For details please refer to Appendix 4.
	-	

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification

By means of comparison of the MR and the ER calculation with the latest version of the registered PDD the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly.
Further it has been checked whether the GWP for the respective period have been correctly applied.
The following list of ex-ante fixed parameters have been applied:

Nbr.	Parameter abbreviation	Description	Value	Unit
1	$NCSG_{BC}$	N2O concentration in the stack gas during the baseline campaign.	1,630.03	mg/Nm³
2	VSG_{BC}	Normal gas volume flow rate of the stack gas during the baseline campaign.	72,468	Nm³/h
3	BE_{BC}	Total N_2O mass flow during baseline campaign	651.983	tN2O
4	OH_{BC}	Operating hours	4,950	h
5	NAP_{BC}	Metric tonnes of 100% concentrated nitric acid produced during the baseline campaign.	134,700	tHNO3
6	TSG	Temperature in the stack gas	n.a.	°C
7	PSG	Pressure in the stack	n.a.	PA (absolute)
8	EF_{BL}	Emission factor for baseline period	0.004647	tN_2O / $tHNO_3$
9	UNC	Calculated overall uncertainty of the Automated Monitoring System (AMS)	3.99	%
10	AFR	Mean Ammonia gas flow rate to the ammonia oxidation reactor	Not applicable, monitored data of AFR will be used to determine if plant was operating outside of AFR_{max}	-
11	AFR_{max}	Maximum Ammonia gas flow rate to the ammonia oxidation reactor	9.094	tNH_3/h (converted from originally measured Nm³/h)
12	AIFR	Ammonia to air ratio into the ammonia oxidation reactor	8.3 to 11.5	(AIFR will be used to determine

				AIFRmax).
13	CL_{BL}	Length of the baseline campaign measured in metric tonnes of 100% concentrated nitric acid produced during that baseline campaign.	134,700	tHNO3
14	CL_{normal}	Average length of the historic campaigns measured in metric tonnes of 100% concentrated nitric acid produced during the historic campaigns.	127,302.4	tHNO3
15	$AIFR_{max}$	Maximum Ammonia to air ratio into the ammonia oxidation reactor.	11.5	%v/v
16	OT_h	Oxidation temperature for each hour during the baseline campaign	n.a.	
17	OT_{normal}	Normal range operating temperature	820 to 905	°C (min and max)
18	OP_h	Oxidation Pressure for each hour during the baseline campaign	n.a.	kPa
19	OP_{normal}	Normal range of operating pressure in the ammonia oxidation reactor	365 – 450	kPa (gauge) min and max
20	GS_{normal}	Gauze supplier for the operating condition (i.e. historic) campaigns	W.C. Heraeus Name of Supplier	
21	GS_{BL}	Gauze supplier for the baseline condition campaign	W.C. Heraeus Name of Supplier	
22	GC_{normal}	Gauze composition during the historic operating campaigns expressed as percentage by weight of the precious metals Platinum, Rhodium and, if applicable, Palladium comprising the Ammonia Oxidation Catalyst gauzes.	Platinum (Pt) 56.5; Rhodium (Rh) 3.8; Palladium (Pd) 39.7	%
23	GC_{BL}	Gauze composition during the baseline campaign expressed as percentage by weight of the	Platinum (Pt) 56; Rhodium (Rh) 3.8; Palladium (Pd) 40.2	%

		precious metals Platinum, Rhodium and, if applicable, Palladium comprising the Ammonia Oxidation Catalyst gauzes.		
24	EF_{reg}	Emissions cap for N_2O from nitric acid production set by government regulation	None	$tN_2O/tHNO_3$

Further the record of the Gauze compositions installed during the historic campaigns are as follows:

Campaign	Gauze Supplier	Gauze Composition		
		Pt (%)	Rh (%)	Pd (%)
C10	Heraeus	58.3	3.9	37.9
C12	Heraeus	56.1	3.8	40.1
C13	Heraeus	56.4	3.8	39.8
C14	Heraeus	56.1	3.8	40.1
C15	Heraeus	55.4	3.8	40.8
Average		**56.5**	**3.8**	**39.7**

The following sources of information have been used in this context:

- /MR/
- /XLS/
- /PDD/
- /PS/
- /VVS/
- /unfccc/

Findings	☒	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.
	☐	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	

E.6.2. Data and parameters monitored

Means of verification	During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) 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 (Appendix 5).	
Findings	For details please refer to appendix 5 CAR E.6.2.1 and CAR E.6.2.2	
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	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.	

E.6.3. Implementation of sampling plan

Means of verification	The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values. Further it has been checked whether the PPs have correctly applied the implemented sampling plan including (i) description of the implemented sampling design (ii) collected data (iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met. The following sources of information have been used in this context: • /MR/ • /XLS/ • /PDD/.			
Findings	☒	The PPs have not applied sampling approaches for the parameters monitored.		
	☐	The PPs have applied sampling approaches for the following parameters monitored.		
		1	Parameter:	
			Name:	
			Description on how the sampling efforts and survey comply with the validated sampling plan:	
		2	Parameter:	
			Name:	
			Description on how the sampling efforts and survey comply with the validated sampling plan:	
	☐	In this context the following CARs, CLs, FARs have been raised:		
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	-			

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated PDD and/or the applicable calibration standards. The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6). The following sources of information have been used in this context: • /MR/ • /XLS/ • /CAL/, /QAL1/, QAL2/, /AST/.

Findings	☐	Based on the details listed in appendix 6 the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.
	☒	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6
	☐	In this context the following CARs, CLs, FARs have been raised:
		FAR 01, CAR E.6.2.1
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The installed equipment is either calibrated or related requirements w.r.t. delay of calibration has been applied in conservative manner. Besides see assessment to related findings raised. Further FAR 01 has been raised during previous verification as it has been identified that the gas bottle used for QAL3 tests containing span gas for NO is still the previous bottle with a production date of 24/08/2015 and a stated gas stability of 12 months resulting in 23/08/2016. This is after the end date of previous monitoring period. Therefore this FAR was raised in order to consider that the bottle was still in use during onsite inspection on 23/02/2017. This has been considered during this verification accoridngly. Please refer to Appendix 4 for related final DOE assessment. As per onsite check of related supporting documents the end subsequent QAL3 has been conducted on 23/05/2017. Therefore the delayed calibration period is from 24/08/2016 until 22/05/2017. The max value of the last two QAL2 tests has been applied in conservative why, leading to less emission reductions, for this period. The applied method has been checked and found correct.	

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified: • *Transparency:* It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • *Parameter consistency:* It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • *Correctness:* It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. • *Completeness:* It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/, /PDD/, /QAL2/, /AST/, /OCS/ • /RAW/, /PROD/, /XLS/, /LOG/.	
Findings	☐	The calculation of the baseline emissions was found to be fully compliant with the above stated principles. The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission

		factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	☒	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	☒	In this context the following CARs, CLs, FARs have been raised:
		CAR E8.1
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

Where corrections where required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.
The emission reductions are calculated as following:
$ER_y = BE_y – PE_y – LE_y$
$ER_y = (EF_{BL} – EF_p) \times NAP \times 10^{-3} \times GWP_{N2O}$

With
EF_{BL} depending on CL_n in comparision to CL_{normal}. For this monitoring period EF_{BL} is

Campaign	CL_n comparison with CL_{normal} and CL_{BL} if required	EFBL value [$tN_2O/tHNO_3$]
PC18	$CL_n > CL_{normal}$	0.0004647
PC19	$CL_n < CL_{normal}$	0.0004293
PC20	$CL_n < CL_{normal}$	0.0004631

The plant specific baseline emission factor is calculated as following:
$EF_{BL} = (BE_{BC} / NAP_{BC}) \times (1 – UNC/100)$
With determined via:
$BE_{BC} = VSG_{BC} \times NCSG_{BC} \times 10^{-9} \times OH_{BC}$
CL_n is longer than CL_{BL} for PC18, therefore no adjustment of the Baseline emissions factor EF_{BL} is necessary. However, CL_n is shorter than CL_{BL} for PC19 and PC20, therefore an adjustment of the Baseline emissions factor EF_{BL} is applied. EF_{BL} is recalculated by eliminating those N_2O values that were obtained during the production of tonnes of nitric acid beyond the CL_{BL} (i.e. the last tonnes produced) from the calculation of EF_{BL}. This was the case at 30/09/2006 10:00 for PC19 and 25/01/2007 20:00 for PC20. All N_2O data measured from the respective hour on got excluded for the recalculation of EF_{BL}.

BE_{PC18} = 72,468 [Nm³/h] * 1.01 * 1,630.03 * 1.104 [mg/Nm³] * 10^{-9} * 4,950 [h] = 651.98 [tN_2O]
EF_{PC18} = 651.98 [tN_2O] / 134,699.8 [$tHNO_3$] * 10^3 * (1 – 3.99/100) = 4.647 [$kgN_2O/tHNO_3$]

BE_{PC19} = 72,468 [Nm³/h] * 1.01 * 1,505.73 * 1.104 [mg/Nm³] * 10^{-9} * 4,950 [h] = 602.267 [tN_2O]
EF_{PC19} = 602.267 [tN_2O] / 134,700 [$tHNO_3$] * 10^3 * (1 – 3.99/100) = 4.293 [$kgN_2O/tHNO_3$]

BE_{PC20} = 72,468 [Nm³/h] * 1.01 * 1,624.23 * 1.104 [mg/Nm³] * 10^{-9} * 4,950 [h] = 649.666 [tN_2O]
EF_{PC20} = 649.666 [tN_2O] / 134,700 [$tHNO_3$] * 10^3 * (1 – 3.99/100) = 4.631 [$kgN_2O/tHNO_3$]

Note that small deviations occur due to rounding. Please refer to the calculation excel file for details.
Should N_2O emissions regulations that apply to nitric acid plants be introduced in the host country or jurisdiction covering the location of the project activity, such regulations shall be compared to the calculated baseline emission factor for the project (EF_{BL}). If the regulatory limit is lower than the baseline factor determined for

	the project, the regulatory limit shall serve as the new baseline emission factor, that is: if $EF_{BL} > EF_{reg}$, then the baseline N_2O emission factor shall be EF_{reg} for all calculations. where: Variable Definition EF_{BL} Baseline emissions factor ($tN_2O/tHNO_3$) EF_{reg} Emissions level set by newly introduced policies or regulations ($tN_2O/tHNO_3$). As per check of related regulations no such emission level set by the host country of South Africa could be identified for this monitoring period. After corrections have been carried out the calculation of the baseline emissions was found to be fully compliant with the above stated principles. Further the calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified after the correction.

E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified: • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/, /PDD/, /QAL2/, /AST/, /OCS/ • /RAW/, /PROD/, /XLS/, /LOG/.	
Findings	☐	The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☒	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☒	In this context the following CARs, CLs, FARs have been raised:
		CAR E8.1
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Where corrections where required a revised PE calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed	

appropriately so that it can be confirmed that the baseline calculation is overall correct.
The emission reductions are calculated as following:
$ER_y = BE_y – PE_y – LE_y$
$ER_y = (EF_{BL} – EF_p) \times NAP \times 10^{-3} \times GWP_{N2O}$
With EF_p to be determined as following:
$EF_p = EF_{ma,n}$ if $EF_{ma,n} > EF_n$ or $EF_p = EF_n$ if $EF_{ma,n} < EF_n$
$EF_{ma,n} = (EF_1+EF_2+ … +EF_n) / n$
$EF_n = PE_n/NAP_n$
$PE_n = VSG \times NCSG \times 10^{-9} \times OH$
As per check of related raw data from AMS against the ER spreadsheet as well as crosscheck with nitrates balance and log sheets besides calibration sheets of related measurement equipment as well as interviews with personnel the following data is to be applied:
For the number of data sets and the respective amount of NAP during the campaigns included in this monitoring period:

Campaign	Data sets	NAP (in $tHNO_3$)
PC18	5,424	139,630
PC19	2,832	49,837
PC20	4,584	119,572

After elimination of implausible data sets as per trip value of the plant OT_h > 820 °C the remaining operating hours are:

Campaign	Data sets
PC18	4,874
PC19	1,733
PC20	4,276

By applying the 95% confidence interval on the remaining NCSG and VSG values mavericks and outliers are excluded. The 95% confidence interval for NCSG and VSG values is derived and the outliers excluded individually for VSG and NCSG. Hence, the remaining number of data sets may differ between NCSG and VSG. The resulting mean values for NCSG and VSG are applied for calculation of the Project emissions (PE).

The resulting values for $NCSG_n$, VSG_n, OH_n, NAP_n, project emissions (PE_n) and project emission factor (EF_n) for the project campaigns covered by this monitoring report are:

Value	Unit	PC18	PC19	PC20
$NCSG_n$	mg/Nm³	566.89	583.11	448.07
QAL2 NCSG		1.0058	1.0354	1.0354
VSG_n	Nm³/h	76,967	80,127	78,899
QAL2 VSG		0.992	1.216	1.216
OH_n	H	4,874	1,733	4,276
NAP_n	t HNO_3	139,630	49,837	119,572
PE_n	t N_2O	212.186	101.944	190.322
EF_n	kg N_2O/t HNO_3	1.520	2.046	1.592

If the length of each individual project campaign CL_n is longer than or equal to the average historic campaign length CL_{normal} or to the baseline campaign length whichever is shorter, then all N_2O values measured during the baseline campaign can be used for the calculation of EF (subject to the elimination of data from the operational limits analysis, see above under recalculation of Baseline Emission factor).
PE_{PC18} = 76,967 [Nm³/h] x 0.992 x 567 [mg/Nm³] x 1.006 x 10^{-9} x 4,874 [h] = 212.2 [tN2O]
EF_{PC18} = 212.2 [tN2O] / 139,630 [tHNO3] x 10^3 = 1.52 [kgN2O/tHNO3]

PE_{PC19} = 80,127 [Nm³/h] x 1.216 x 583 [mg/Nm³] x 1.035 x 10^{-9} x 1,733 [h] = 101.9 [tN2O]
EF_{PC19} = 101.9 [tN2O] / 49,837 [tHNO3] x 10^3 = 2.05 [kgN2O/tHNO3]

	PE_{PC20} = 78,899 [Nm³/h] x 1.216 x 448 [mg/Nm³] x 1.035 x 10^{-9} x 4,276 [h] = 190.3 [tN2O] EF_{PC20} = 190.3 [tN2O] / 119,572 [tHNO3] x 10^3 = 1.59 [kgN2O/tHNO3] Note that small deviations occur due to rounding. The figures stated here reflect the correct values as of the excel calculation. Please refer to the calculation excel file for details. After corrections have been carried out the calculation of the baseline emissions was found to be fully compliant with the above stated principles. Further the calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified after the correction.

E.8.3. Calculation of leakage GHG emissions

Means of verification	During the verification it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. In such cases the same verification principles have been considered as for the baseline and project emissions calculation. Please refer to E.8.1 and E.8.2. The following sources of information have been used in this context: • /MR/ • /XLS/.	
Findings	☒	No leakage emissions were to be considered (LE = 0).
	☐	The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2). The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	As per methodology leakage emissions do not have to be considered. Therefore LEy = 0	

E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately - Total baseline emissions, - Total project emissions, - Total leakage, - Total emission reductions. It has been assessed whether the values are correct or need to be revised as a

	consequence of issues identified above.	
Findings	☒	Section E.4 of the MR includes a summary table of the emission reductions calculation.
	☒	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	☐	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	☐	During the verification issues with impact on the ER calculation have been identified.
	☒	In this context the following CARs, CLs, FARs have been raised:
		CAR E8.1, CAR E.6.2.1, CAR E.3.1
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

$ER_y = BE_y – PE_y – LE_y$

$ER_{PC18} = (EF_{BL} – EF_p) \times NAP \times 10^{-3} \times GWP_{N2O}$
= (4.647kg N2O/t HNO3 - 1.520kg N2O/t HNO3) x 139,630 t HNO3 x 10^{-3} x 298 tCO2e/tN2O
= 130,135 tCO2e

$ER_{PC19} = (EF_{BL} – EF_p) \times NAP \times 10^{-3} \times GWP_{N2O}$
= (4.293kg N2O/t HNO3 – 2.046kg N2O/t HNO3) x 49,837 t HNO3 x 10^{-3} x 298 tCO2e/tN2O
= 33,374 tCO2e

$ER_{PC20} = (EF_{BL} – EF_p) \times NAP \times 10^{-3} \times GWP_{N2O}$
= (4.631kg N2O/t HNO3 - 1.592kg N2O/t HNO3) x 119,572 t HNO3 x 10^{-3} x 298 tCO2e/tN2O
= 108,284 tCO2e

Differences with MR, ER spreadsheet or recalculation by applying stated values are due to rounding or not applying all digits.
The emission reductions for this monitoring period covering one campaign are as following:

Campaign	Baseline Emissions [tCO2e]	Project Emissions [tCO2e]	Emission Reductions [tCO2e]
PC18	193,367	63,231	130,135
PC19	63,725	30,379	33,374
PC20	165,000	56,716	108,284

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	☒	*Case 1:* The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	☐	*Case 2:* The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	☐	*Case 3:* The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	No further justification required as the achieved emissions are lower than the ex-ante estimated value.	

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	☒	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	☐	*For case 3:* The PP has provided a related justification in the MR. The reasons for the increase are as follows: - N/A
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The verification team has checked chapter E.4 of the MR and the emission reduction calculation sheet /XLS/.			
Findings	☒ The MR in section E.4 includes a summary table of the ER breakdown a) ER before 01/01/2013 and b) ER from 01/01/2013 onwards ☒ The breakdown of the ERs before 01/01/2013 (during the first commitment period) and from 01/01/2013 onwards is as follows: ☐ The ER have completely been generated before 01/01/2013 (during the first commitment period) ☒ The ERs have completely been generated from 01/01/2013 onwards, ☐ The ERs have partly been generated before 01/01/2013 (during the first commitment period) and partly from 01/01/2013 onwards. ☒ The breakdown of the ERs is correct, considering the applicable guidance.			
		before 01/01/2013	**from 01/01/2013**	**Sum**
	Emission reductions [tCO_{2e}]	0	271,793	271,793
	☐	In this context the following CARs, CLs, FARs have been raised:		
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	The data provided in the MR is correct as well as the related breakdown. The calculations of GHG emission reductions or net anthropogenic GHG removals are in accordance with the project standard.			

E.9. Assessment of reported sustainable development co-benefits

Means of verification	☒	N/A – as the PP has not monitored the sustainable development co-benefits

		of the registered CDM project activity or not requested the DOE to verify them.
	☐	The project participants have monitored the sustainable development co-benefits of the registered CDM project activity, and requested the DOE to verify them. The following sources of information have been used in this context: • /MR/ • /PDD/ • /DSD/ • /unfccc/.
Findings	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	☐	Therefore the DOE has assessed and confirms that: (a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the "CDM project standard for project activities"; (b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	-	

E.10. Global stakeholder consultation

Means of verification		In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage. The monitoring report has been published for the period 08/02/2018 to 28/02/2018. The following sources of information have been used in this context: • /MR/ • /unfccc/.
Findings	☒	No comments have been received on the published monitoring report for this monitoring period.
	☐	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	☐	Comments have been received. The DOE has - requested further information from the submitters of the comments - informed the project participants of the comments received, and requested their feedback within a specified timeframe, - considered the input received and has assessed whether such comments are relevant to the CDM project activity, - acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity, - assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below), - used all possible means to determine the authenticity of the name

		and contact details of the individual or organization on whose behalf the comments have been submitted, - contacted the secretariat to make them publicly available (if only addressed to the DOE), - determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.
	☐	In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.

As the DOE has concluded that comments are related to issues outside the CDM rules and requirements the comments and information gathered are listed as follows:

Nbr.	Original comment received	Feedback by the PP	Statement by DOE
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-

SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are 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 have been confirmed or revised. Furthermore reporting improvements might have been achieved.
After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.
After this step the submission for requesting for issuance is conducted.

SECTION G. Verification opinion

AEL mining Services Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 10th periodic verification of the project: “N2O ABATEMENT PROJECT AT NITRIC ACID PLANT NO. 11 AT AFRICAN EXPLOSIVES LTD. (AEL), SOUTH AFRICA”, with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to abatement of N2O emissions by a secondary catalyst. This verification covers the period from 18/08/2016 to 07/02/2018 (including both days).

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 validated project design document,
- the monitoring plan is in accordance with the applied approved CDM methodology,

- 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,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above mentioned reporting period as stated on the title page.

SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the project

"N2O ABATEMENT PROJECT AT NITRIC ACID PLANT NO. 11 AT AFRICAN EXPLOSIVES LTD. (AEL), SOUTH AFRICA"

registered under

UNFCCC-No. : 1364

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 10

from: 18/08/2016

to: 07/02/2018

(including both days) as follows:

Emission reductions: 271,793 tCO_{2e}.

Essen, 13/04/2018

Stefan Winter
Team leader

Appendix 1. Abbreviations

Abbreviations	Full texts
AEL	AEL Mining Services Limited
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO_2	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
CL	Clarification Request
DVerR	Draft Verification Report
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GSC	Global Stakeholder Consultation
IM	Interview Memo
MP	Monitoring Plan or Monitoring Period
MPE	Maximum Permissible Error
MR	Monitoring Report
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet

Appendix 2. Competence of team members and technical reviewers

TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 5, Date: 2017-07-20

163_S01-VA060-F20_2017-07-20_rev5 S01-VA060-F20 rev3 / 2012-10-25

TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Grzegorz Kochaniewicz

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-02-08
VCS / ISO 14064-2	Senior Assessor	2019-02-08

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy Demand
14.1	Afforestation and Reforestation

173 - Rev. 7, Date: 2016-02-09

173_S01-VA060-F20_2016-02-09_rev7.doc S01-VA060-F20 rev3 / 2012-10-25

TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Rainer Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-07-01
JI	Senior Assessor Technical Reviewer	2019-07-01
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2019-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewables
4.1	Cement and lime production
4.2	Paper
5.1	Chemical Industry
5.2	Caprolactam, nitric and adipic acid
8.1	Mining/mineral production
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
11.1	Emissions of fluorinated gases
11.2	Refrigerant gas production
12.1	Chemical industry
13.1	Solid waste and wastewater

003 - Rev. 10, Date: 2016-07-01

003_S01-VA060-F20_2016-07-01_rev10.doc S01-VA060-F20 rev3 / 2012-10-25

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	UNFCCC	**/AM34/**	ACM0034 "Catalytic reduction of N2O inside the ammonia burner of nitric acid plants", version 2 Furthermore, the project draws on approved baseline methodology AM0028 "N2O destruction in the tail gas of Caprolactam production plants", version 04.1 for the baseline scenario selection	https://cdm.unfccc.int/methodologies/DB/993RRDBB2WJI9TAD2XCKPK5YATQXY6 https://cdm.unfccc.int/methodologies/DB/Y0S50SAZFK4FJOMZH2T7EN1I3HI8T0	Other
2	DOE	**/CPM/**	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
3	PP	**/DSD/**	Documents for monitoring sustainable development co-benefits		Other
4	UNFCCC	**/GOT/**	Glossary "CDM terms" (version 09.1)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20170831165430180-Glos_CDMv9_1.pdf/Glos_CDMv9_1.pdf?t=THR8cDB1cjhjfDA3nY9J2NxQKB7POsLROrM-	Other
5	IPCC	**/IPCC/**	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other
6	UNFCCC	**/KP/**	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
7	UNFCCC	**/MA/**	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
8	PP	**/MR/**	Monitoring Report for CDM project: "N2O ABATEMENT PROJECT AT NITRIC ACID PLANT NO. 11 AT AFRICAN EXPLOSIVES LTD. (AEL), SOUTH AFRICA" version 1, dated 08/02/2018 version 2, dated 05/03/2018 version 3, dated 11/04/2018 version 4, dated 13/04/2018		Other
10	UNFCCC	**/MRT/**	Monitoring Report Form (CDM-MR-FORM), Version 6.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other

No.	Author	Reference	Title	References to the document	Provider
11	UNFCCC	**/PDD/**	Project Design Document for CDM project: "N2O ABATEMENT PROJECT AT NITRIC ACID PLANT NO. 11 AT AFRICAN EXPLOSIVES LTD. (AEL), SOUTH AFRICA" version 2, dated 08/07/2016	https://cdm.unfccc.int/filestorage/L/H/2/LH2DQAYUZ4VSCWX7NM96KBTG3PIRJ5/PDD_AEL11_revision_2016.pdf?t=TDh8cDU1cmFpfDAjz5DMwhGNKefTYH0qKArv	Other
12	UNFCCC	**/PS/**	CDM Project Standard (Version 1.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
13	UNFCCC	**/SAMPLE/**	"Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" (Version 04.0) "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" (version 7.0)	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other
14	UNFCCC	**/TOOL/**		http://cdm.unfccc.int/Reference/tools/index.html	Other

Rel.	Name	Ver.
☐	Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion	2
☐	Emissions from solid waste disposal sites	7
☐	Tool to calculate baseline, project and/or leakage emissions from electricity consumption	1
☐	Project emissions from flaring Version	2.0.0
☐	Tool to calculate the emission factor for an electricity system	4.0
☐	Tool to determine the mass flow of a greenhouse gas in a gaseous stream	2.0.0
☐	Tool to determine the baseline efficiency of thermal or electric energy generation systems	1
☐	Tool to determine the remaining lifetime of equipment	1
☐	Project and leakage emissions from transportation of freight	1.1.0
☐	Project and leakage emissions from composting	1
☐	Project and leakage emissions from anaerobic digesters	1
☐	Upstream leakage emissions associated with fossil fuel use	2.0

No.	Author	Reference	Title	References to the document	Provider
			☐ Project and leakage emissions from biomass 2 ☐ Leakage in biomass small-scale project activities 4.0		
15	PP	**/VAL/**	Validation Report for CDM project "N2O abatement project at nitric acid plant No. 11 at African Explosives Ltd. (AEL), South Africa" version 1, dated 27/09/2007 Validation report form for post-registration changes for CDM project activities for project "N2O abatement project at nitric acid plant No. 11 at African Explosives Ltd. (AEL), South Africa" version 1, dated 23/12/2016	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1190979826.1/view	Other
16	PP	**/VER/**	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)	https://cdm.unfccc.int/Projects/DB/TUEV-SUED1190979826.1/view	Other
17	UNFCCC	**/VVS/**	CDM Validation and Verification Standard (Version 01.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
18	Müller-BBM GmbH	**/AST/**	Report for AST (03/07/2012 – 04/07/2012) issued by Müller-BBM GmbH, Report Nr: M100097/02 dated 08/08/2012 Report for AST (07/08/2013 and 22/10/2013 – 24/10/2013) issued by Müller-BBM GmbH, Report Nr: M106390/02 dated 13/02/2014 Report for AST (01/03/2016 – 02/03/2016) issued by Müller-BBM GmbH, Report Nr: M124040/02 dated 21/03/2016		PP
19	PP	**/BR/**	Breakdown/Downtime reports		PP
20	PP, supplier	**/CAL/**	• Calibration procedures • Calibration certificates and documentation done by supplier • Calibration certificates from day-to-day checks/calibrations and documentation done by AEL • E+H differential pressure flow meter		PP
21	AFROX Analytical Services	**/CoC/**	Certificate of Conformance for Test Gases: N_2O, Nitrogen (zero and span gas)		PP
22	PP	**/FSNA/**	Flow Sheet Nitric Acid Plant		PP
23	PP SABS	**/ISO/**	• ISO 9001:2008 certificate for "The design, manufacture and supply of ANFO explosives (ammonium nitrate fuel oil), powergel emulsion explosives and energan bulk explosives"	https://www.sabs.co.za/Business_Units/Standards_SA/SABSTAN/STANDARDS_DEVELOPMENT/Published_Stand	PP

No.	Author	Reference	Title	References to the document	Provider
			• ISO 14001:2004 certificate for "The manufacture, sale and distribution of fertilizer and related products" • Related procedures of the Quality Management System handbook esp. those with respect to the project activity - CSQMS0014: Calibration and Maintenance - CSQMS0018: Supplier quality assurance - CSHR0003: Process operations: Eduction, Training and Development List of local standards in South Africa	ards/PS070.PDF	
24	PP	**/LOG/**	Record log sheet of operator including main operation data and HNO3 temperature and density taken by manual measurement and concentration.		PP
25	PP	**/NATGAS/**	Gas Composition Specification for calibration gas for NO, NOx and N2O		PP
26		**/OCS/**	Actual operating condition values of the N2O destruction facility during the on-site visit.		PP
27	PP	**/P&I/**	P&I Diagram		PP
28	PP	**/PPT/**	Presentation of the company AEL Mining Services Ltd. and production facilities		PP
29	PP	**/PROD/**	Production data for the period August 2016 to February 2018 on monthly basis Nitrates balance for years 2016, 2017 and 2018 (till Feb)		PP
30	TÜV SÜD	**/QAL1/**	Suitability testing report by TÜV SÜD, Germany, report no. 2410 6657 and 170 608 dated June 2006		PP
31	Müller-BBM GmbH	**/QAL2/**	Report for QAL2 test (22/06/2011 – 25/06/2011) issued by Müller-BBM GmbH, Report Nr: M92 321/2 , dated 30/09/2011 Report for QAL2 test (23/09/2014 – 25/09/2014) issued by Müller-BBM GmbH, Report Nr: M114144/02 , dated 08/12/2014 Report for QAL2 test (26/04/2017 – 28/04/2017) issued by Müller-BBM GmbH, Report Nr: M130195/12, dated 10/10/2017		PP
32	PP	**/QAL3/**	Daily and Monthly Check log sheets for the Emerson N_2O analysers		PP
33	PP	**/RAW/**	Raw data: Hourly and monthly summarized data from AMS Technical Managers log spreadsheet		PP
34	PP	**/TRAIN/**	Training protocols for the operation of the Monitoring System esp. the		PP

No.	Author	Reference	Title	References to the document	Provider
			Analyser. QAL3 training and attendance register		
35	PP	**/TS/**	Technical data sheets of installed monitoring equimpment		PP
36	PP	**/XLS/**	Initial emission reduction calculation spreadsheet ver 1 and emission reduction calculation spreadsheet ver 2 emission reduction calculation spreadsheet ver 3		PP
37	Heraeues	**/GC/**	Confirmation by manufacturer Heraeus of thegauze composition used during the project campaigns for this monitoring period dated 15/01/2018		PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	01	**Section no.**		**Date:** DD/MM/YYYY
Description of FAR				
During assessment it has been identified that the gas bottle used for QAL3 tests containing span gas of NO is still the previous bottle with a production date of 24/08/2015 and a stated gas stability of 12 months resulting in 23/08/2016. This is after the end date of this monitoring period. Therefore this FAR is raised in order to consider that the bottle was still in use during onsite inspection on 23/02/2017.				
Project participant response				**Date:** DD/MM/YYYY
A new gas bottle has been installed on 18/05/2017. The first QAL3 test with the new gas bottle were conducted on 23/05/2017. In order to adhere the guidelines for assessing compliance with the calibration frequency requirements as stipulated in paragraph 369 of VVS the maximum permissible error of the instruments for NCSG were applied. The error was applied in a conservative manner for the period between the expiration date of the bottle and the first valid zero and span check after the installation of the new bottle. The more conservative error of the two QAL2 reports has been selected and it was applied for the period from 24/08/2016 to 22/05/2017.				
Documentation provided by project participant				
MR, picture of new gas bottles, QAL3 records				
DOE assessment				**Date:** 02/03/2018
Ok. In line with VVS related regulations for delayed calibration have been applied. The MPE has been applied correctly and in conservative manner to all values from 24/08/2016 to 22/05/2017 when QAL 3 was done again and new bottle was in. As MPE the higher of the last two QAL2 has been applied due to conservativeness for NCSG values for the delayed period.				

Table 2. CL from this verification

CL ID	xx	**Section no.**		**Date:** DD/MM/YYYY
Description of CL				
n.a.				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY

Table 3. CAR from this verification

CAR ID	E.1	**Section no.**	E.1	**Date:** 01/03/2018
Description of CAR				
Following editorial issues and issues w.r.t. filling MR have been identified: - The date of completion of MR is not reasonable - Clarify why AM0028 and AM0034 are given on title page as, as per related UNFCCC project page only AM0034 is stated. - There have been PRCs prior to this monitoring period which have been already approved. As per instructions to fill MR the following is to be given, "list all changes/corrections since the registration of the project" and "provide the approval dates and reference numbers of the post-registration changes."				
Project participant response				**Date:** 05/03/2018
- The typo in the date of completion of MR has been corrected. - The summarizing UNFCCC project page only states AM0034 as the used methodology, while AM0034 refers to AM0028. The first summary page of the MR has been corrected to reflect the summarizing UNFCCC project page. It now only states AM0034. - All PRCs prior to this monitoring period, which have already been approved are now stated in the MR. All changes and corrections since the registration of the project are now stated as well as the approval dates and reference numbers of the post-registration changes.				
Documentation provided by project participant				
MR ver 2				
DOE assessment				**Date:** 06/03/2018
- Ok. The date has been revised and MR ver 2 is dated 05/03/2018. - Ok. In line with UNFCCC project webpage as well as latest PDD only AM0034 (ver 2) is given now on title page. - Ok. Related PRCs for correction and permanent changes to MP have now been provided in updated MR in line with instructions to fill MR. As all issues are solved, this finding is closed.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	E.3.1	**Section no.**	E.3	**Date:** 01/03/2018
Description of CAR				
During check of raw data it has been identified that the plant was also shut down for the time priod from 02/02/2018 9:00 until 02/02/2018 23:00. The same has not been considered in the MR section B.1. Update requested.				
Project participant response				**Date:** 05/03/2018
Section B.1. has been updated and the shut down is now considered in the table.				
Documentation provided by project participant				
MR ver 2				
DOE assessment				**Date:** 06/03/2018
Ok. The related shut down period has been added to the list in section B.1 of updated MR.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	E.6.2.1	**Section no.**	E.6.2, E.7	**Date:** 01/03/2018
Description of CAR				
1. Parameter NCSG the date when QAL has been done with new bottle is inconsistent with actual date as found during onsite inspection. As per onsite check the QAL 3 has been conducted 23/05/2017. Revision requested. 2. Parameter NAP: The information given under "Additional comment" are inconsistent to data as per value monitored and title page. Clarify and revise accordingly.				
Project participant response				**Date:** 05/03/2018
1. The date of the first QAL3 conducted with the new gas bottle has been updated to reflect the actual date. 2. The Additional comment of the NAP parameter has been revised to be consistent with the values monitored.				

Documentation provided by project participant	
MR ver 2	
DOE assessment	**Date:** 06/03/2018
1. Ok. Related correction under parameter NCSG has been applied in updated MR. MR refers now to the correct date of 23/05/2017 and end date of delayed calibration period 22/05/2017. 2. Ok. The descitrpion provided has been revised to actual values for this monitoring period as checked with related ER spreadsheet and related supporting documents. 3. Not ok. However it has been identified that the accuracy stated for parameter OTh of +-0.4% is inconsistent with related applied calibration certs and previous verifications.	
Project participant response	**Date:** 13/04/2018
3. Corretced	
Documentation provided by project participant	
MR ver 4	
DOE assessment	**Date:** 13/04/2018
3. Ok. Related change has been conducted to MR and now correctly states an accuracy of +-1.0%.	
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	E.6.2.2	**Section no.**	E.6.2	**Date:** 01/03/2018
Description of CAR				
During onsite inspection it has been identified that in July 2017 during shutdown and gauze change the mass flow meter has been exchanged for a new one of same manufacturer, model, type and accuracy. However only the details of the previous meter are stated in MR. Revision requested.				
Project participant response				**Date:** 05/03/2018
The MR has been revised and the details of both NAP flow meters are now stated in the MR.				
Documentation provided by project participant				
MR ver 2				
DOE assessment				**Date:** 06/03/2018
Ok. Also the serial number as checked during onsite inspection has been provided now in the MR under “monitoring equipment” of the parameter NAP.				
Conclusion *Tick the appropriate checkbox*		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	D.1	**Section no.**	ER calc, D.2	**Date:** 01/03/2018
Description of CAR				
Following issues w.r.t. ER calculation have been identified: 1. During check with original data it has been identified that the data used for ER calculation for the months February 2018 are inconsistent with the original data. Revision to original data is requested. 2. Further the MR and ER spreadsheet state a delay in calibration form 29/02/2017 whereas there was no 29th Februray in 2017. Please clarify and revise MR and ER spreadsheet. 3. Besides for the calculation of the delayed calibration the maximum permissible error has not been applied for all values during the delayed period for VSG.				
Project participant response				**Date:** 05/03/2018
1. The data used for ER calculation for the month February 2018 have been revised and the original data has been used. 2. The previous AST was valid unitl 28/02/2017 and thus the delay in calibration started on 01/03/2017 and not on 29/02/2017. The spreadsheet has been corrected. 3. The formula used for the calculation of the delayed calibration the maximum permissible error for the delayed period for VSG was applied incorrectly. The formula has been corrected and now all VSG values are calculated correctly.				
Documentation provided by project participant				
ER spreadsheet ver 2, MR ver 2				
DOE assessment				**Date:** 06/03/2018

1. Ok. The ER spreadsheet has been updated with correct data for month Februrary 2018 as per onsite checked actual raw data. 2. Ok. The ER spreadsheet has been corrected accordingly. The correct date of 01/03/2017 is given now. 3. Ok. As per updated ER spreadsheet the correct MPE is now applied for the delayed period for parameter VSG and the method of calculation is also correct and leads to a conservative final emission reductions result, to lower emission reductions. 4. However it has been identified that the recalculation of the baseline for CP19 and CP20 is not fully correct.	
Project participant response	**Date:** 11/04/2018
4. ER calculation has been corrected. MR revised accordingly.	
Documentation provided by project participant	
ER spreadsheet ver 3, MR ver 3	
DOE assessment	**Date:** 11/04/2018
4. Ok. ER spreadsheet has been checked and PC19 and PC20 are now correctly calculated as per reg PDD and methodology. MR has been updated accoridingly in line with ER changes.	
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 4. FAR from this verification

FAR ID	xx	**Section No.**		**Date:** DD/MM/YYYY
Description of FAR				
n.a.				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY

Appendix 5. Monitored Parameter

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
A. ***NCSG***		N2O concentration in the stack gas during each project campaign		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /QAL3/ /RAW/	*Description:* The N2O concentration is measured by continuous gas analyzer ABB AO2040 URAS 14. The analyzer is part of an automated monitoring system which is in line with standard EN 14181. AM0034 requires all key meters for the N2O determination to be subject to a quality control regime that will include regular maintenance and calibration according to the European Norm EN 14181. The analyzer has a QAL1 approval. The QAL 2 has been performed on 22/06/2012 to 25/06/2012 and 23/09/2014 to 25/09/2014 and 26/04/2017 to 28/04/2017 by Müller-BBM GmbH. The AST according to EN 14181 was performed on 03/07/2012 to 04/07/2012 and 06/08/2013 and 22/10/2013 to 24/10/2013 also by Müller-BBM GmbH as well as from 01/03/2016 to 02/03/2016 again by Müller-BBM GmbH. The overall measurement accuracy As per QAL2 report dated 08/12/2014 valid until 07/12/2017 is 1.60% and as per QAL2 report dated 10/10/2017 2.12%. AST has been conducted 01/03/2016 valid until 28/02/2017. The gas analyzer is connected to the AMS which automatically records the values every 2 seconds. The AMS also generates hourly data from the 2-sec data. The files are saved month-wise. Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a	~~CAR E.6.2.1~~ ~~FAR 01~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to n.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The monitoring equipment has been checked physically during onsite visit. Besides interview with personnel has been conducted. The measured N2O concentration values were checked during on-site visit, by means of data comparison tests, interviews and observations. Raw data, data from AMS, the ER calculation spreadsheet as well as QA/QC documentation has been checked. Furthermore the calibration procedures under QAL 3 and certificates of used span and zero gases have been analyzed. *Conclusion:* The monitoring procedure is as per reg PDD. Numerous QA/QC checks are implemented and foreseen, such as: - EN 14181 compliance (QAL 1 to QAL 3, AST) including check of analytical function (zero and span check) - Regular checks by the plant maintenance team, - Service checks by the manufacturer and - Data checks by the CDM team Based on the above the monitoring system is duly calibrated. However delay in calibration has been identified as per FAR 01 from previous verification. ☒ In this context the following findings have been raised: ☒ CAR E.6.2.1		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☒	*FAR 01 from previous verification has been considered as validity of gas for QAL3 has been expired from 24/08/2016*		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /QAL3/ /RAW/ /CAL/ /CoC/ /NATGAS/	☐	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan		~~CAR E.6.2.1~~ ~~FAR 01~~	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☐	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☒	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: 24/08/2016 End date of delay: 23/05/2017			
		☒	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☒	The higher maximum permissible error of the latest two QAL2 has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☒	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☒	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		☐ ☐ calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals ☒ The error has been applied to all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. ☒ In this context the following findings have been raised: ☒ CAR E.6.2.1 ☒ *FAR 01 from previous verification has been considered as validity of gas for QAL3 has been expired from 24/08/2016*		
B. VSG		Normal gas volume flow rate of the stack gas during each project campaign		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/	*Description:* The normal gas volume flow of the stack gas during the campaign on a dry basis is monitored by gas flow meter, Emerson Rosemount Annubar® Model 485. The flow meter is part of an automated monitoring system which is in line with standard EN 14181. AM0034 requires all key meters for the N2O determination to be subject to a quality control regime that will include regular maintenance and calibration according to the European Norm EN 14181. The flow meter is part of the QAL1 approval. The QAL 2 has been performed on 22/06/2012 to 25/06/2012 and 23/09/2014 to 25/09/2014 and 26/04/2017 to 28/04/2017 by Müller-BBM GmbH. The AST according to EN 14181 was performed on 03/07/2012 to 04/07/2012 and 07/08/2013 and 22/10/2013 to 24/10/2013 also by Müller-BBM GmbH as well as from 01/03/2016 to 02/03/2016 again by Müller-BBM GmbH. The overall measurement accuracy as per QAL2 report dated 08/12/2014 valid until 07/12/2017 is 2.082% and as per QAL2 report dated 10/10/2017 1.451%. AST has been conducted 01/03/2016 valid until 28/02/2017. The flow meter is connected to the AMS which automatically records the values every 2 seconds. The AMS also generates	~~CAR E.8.1~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		hourly data from the 2-sec data. The files are saved month-wise. Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to n.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report.		
		Verifier´s action: The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The monitoring equipment has been checked physically during onsite visit. Besides interview with personnel has been conducted. The measured flow gas values were checked during on-site visit, by means of data comparison tests, interviews and observations. Raw data, data from AMS, the ER calculation spreadsheet as well as QA/QC documentation has been checked. Furthermore the calibration procedures under QAL 3 and certificates of used span and zero gases have been analyzed.		
		Conclusion: The monitoring procedure is as per reg PDD. Numerous QA/QC checks are implemented and foreseen, such as: - EN 14181 compliance (QAL 1 to QAL 3, AST) including check of analytical function (zero and span check) - Regular checks by the plant maintenance team, - Service checks by the manufacturer and - Data checks by the CDM team However delay in calibration has been identified as well as following finding.		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
		☒	In this context the following findings have been raised:			
			☒	*CAR E.8.1*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/CAL/ /MM/ /MR/	☐	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan		~~CAR E.8.1~~	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☒	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: 01/03/2017 End date of delay: 25/04/2017			
		☒	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☒	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☒	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		permissible error of the instrument ☐ The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals ☒ The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. ☒ In this context the following findings have been raised: ☒ CAR E.8.1 ☐		
C. PEn		Total mass N2O emissions in each project campaign		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/ /LOG/	*Description:* The total mass N2O emissions in each project campaign is not monitored directly but calculated via following equation: PEn = VSG x NCSG x 10-9 x OH For further details of the VSG, NCSG and OH please see related parameter assessments. The gas analyzer (NCSG) and flow meter (VSG) are connected to the AMS which automatically records the values every 2 seconds. The AMS also generates hourly data from the 2-sec data. The files are saved month-wise. The operation time is recorded by the process control system and noted in production log. The value is also recorded in the technical manager log spreadsheet shift-wise for each of the two plants. Every Friday the data from AMS and process control system is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager	Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to n.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report.			
		Verifier´s action: The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The monitoring equipment has been checked physically during onsite visit. Besides interview with personnel has been conducted.			
		Conclusion: The monitoring procedure is as per reg PDD.			
		☐	In this context the following findings have been raised:		
			☐ *N/A*		
			☐		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6		
		☒	No delayed calibration has occurred		
		☒	As per the initial assessment the monitored value is deemed to be correct.		
		☒	The value is calculated and no specific QA/QC procedure is applicable as this parameter is calculated.		
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			
D. OHn		Total operating hours during each project campaign				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if*	/IM01/ /PDD/ /AM34/ /MR/ /PDD/	*Description:* The total operation hours for each campaign are monitored by the process control system. The operation time is recorded by the process control system and noted in production log. The value is also recorded in the technical manager log spreadsheet shift-wise for each of the two plants. Every Friday the data from AMS and process control system is			Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/LOG/ /RAW/ /XLS/	transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to n.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report.			
		Verifier´s action: The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The monitoring equipment has been checked physically during onsite visit. Besides interview with personnel has been conducted.			
		Conclusion: The monitoring parameter is measured and determined as per requirements.			
		☐	In this context the following findings have been raised:		
			☐ *N/A*		
			☐		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MR/ /PDD/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	Ok	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6		
		☒	No delayed calibration has occurred		
		☒	As per the initial assessment the monitored value is deemed to be correct.		
		☒	No specific measurement equipment is installed to monitor this parameter. The parameter is recorded by the process control system of the related nitric acid plant. As the signal is		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.				logged continuously in the plant's DCS, there is a high accuracy. Based on onsite observation and document check, it can be confirmed that the measurement / determination method is in line with the registered monitoring plan of the PDD and the methodology		
		☐		Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		☐		A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☒		In this context the following findings have been raised:		
			☐	N/A		
			☐			

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
E. NAP		Metric tonnes of 100% concentrated nitric acid during each project campaign		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /MR/ /RAW/	*Description:* The Nitric Acid plant output is measured by a Coriolis flow meter (Micro Motion Emerson mass flow meter) CMF 300 serial number 14740820 and 11007573 according to the registered monitoring plan. The instrument measures nitric acid temperature, density and mass flow. The concentration is then calculated internally from this data and the DSC converts the signal to tons 100% HNO3/h. Operation personal creates a print out which is forwarded to the technical manager on daily basis. The technical manager inserts the data into the monthly technical manager log which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data shift-wise. This monthly file is then forwarded to n.serve on weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. Maintenance and calibration of the flow meter and density meter has been applied under the internal QA/QC procedures implemented for this instrument. No inaccuracies in the measurements have been identified. Neither were inaccuracies beyond the permitted range identified during the calibration process. External calibrations have been carried out on as per Appendix 6. The validity of the calibrations is three years. The accuracy of the coriolis mass flow meter is <=0.1%. *Verifier´s action:* By means of checking the daily print-out of DCS, raw data check and interview with the plant personnel the verifier can confirm that the measurement of this parameter is in line with the monitoring plan described in the PDD as well as the applied methodology. Calibration reports have been verified for checking possible inaccuracies detected in the instrumentation. Furthermore the PP investigates the correct function of the instrument by daily density & concentration analysis based on 3 samples per day. The differences of these figures are in the focus regarding an	~~CAR E.6.2.1~~ ~~CAR E.6.2.2~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
		adjustment of the instrumentation and plant operation.				
		Conclusion: The verification team concludes that the measurement of this parameter is in line with the monitoring plan described in the PDD as well as according to the requirements of the applied methodology. All applicable QA/QC procedures are met by the project owner and it can be concluded that the installed monitoring equipment is duly calibrated for this entire monitoring period.				
		☒	In this context the following findings have been raised:			
			☒	*CAR E.6.2.1*		
			☒	*CAR E.6.2.2*		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/CAL/ /MR/ /PDD/ /XLS/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan		Ok	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☒	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☒	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☒	In this context the following findings have been raised:			
			☐	N/A		
			☐			
F. TSG		Temperature in the stack gas				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.*	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/	*Description:* The temperature measurement device is part of the volume flow measurement instrument. The measurement is at the same place as the volume flow/pressure measurement. A Rosemount thermocouple PT100_385 3-wire RTD is installed to monitor the temperature of the stack gas. The thermocouple is part of an automated monitoring system which is in line with standard EN 14181. AM0034 requires all key meters for the N2O determination to be subject to a quality control regime that will include regular maintenance and calibration according to the European Norm EN 14181. The analyzer has a QAL1 approval. The QAL 2 has been			Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		performed on 22/06/2012 to 25/06/2012 and 23/09/2014 to 25/09/2014 and 26/04/2017 to 28/04/2017 by Müller-BBM GmbH. The AST according to EN 14181 was performed on 03/07/2012 to 04/07/2012 and 06/08/2013 and 22/10/2013 to 24/10/2013 also by Müller-BBM GmbH as well as from 01/03/2016 to 02/03/2016 again by Müller-BBM GmbH. As per inital QAL2 report in 2007 the overall measurement accuracy is 2.55%. The overall measurement accuracy has only been established during initial QAL 2 as the vaue is not relevant as the combined error for VSG includes the error of TSG and PSG. The value from the thermocouple is used together with the actual pressure for the normalisation of the volume flow directly in the AMS. The thermocouple is connected to the AMS which automatically records the values every 2 seconds. The AMS also generates hourly data from the 2-sec data. The files are saved month-wise. Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to n.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The monitoring equipment has been checked physically during onsite visit. Besides interview with personnel has been conducted. The measured temperature values were checked during on-site visit, by means of data comparison tests, interviews and observations. Raw data, data from AMS, the ER calculation spreadsheet as well as QA/QC documentation has been checked.		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		Furthermore the calibration procedures under QAL 3 and certificates of used span and zero gases have been analyzed.			
		Conclusion: The monitoring procedure is as per reg PDD. Numerous QA/QC checks are implemented and foreseen, such as: - EN 14181 compliance (QAL 1 to QAL 3, AST) including check of analytical function (zero and span check) - Regular checks by the plant maintenance team, - Service checks by the manufacturer and - Data checks by the CDM team			
		☐	In this context the following findings have been raised:		
			☐ *N/A*		
			☐		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/ /CAL/ /CoC/ /NATGAS/	☐	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	Ok	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6		
		☐	No delayed calibration has occurred		
		☒	As per the initial assessment the monitored value is deemed to be correct.		
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		☒	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: 01/03/2017 End date of delay: 25/04/2017		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		☒ A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the: ☒ The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration ☒ The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument ☐ The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument ☒ The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals ☒ The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. ☐ In this context the following findings have been raised: ☐ N/A ☐		
G. PSG		Pressure in the stack		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment*	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/	*Description:* The pressure measurement device is part of the volume flow measurement instrument. The measurement is at the same place as the volume flow/pressure measurement. A Rosemount pressure equipment is installed to monitor the pressure of the stack gas. The pressure measurement device is part of an automated monitoring system which is in line with standard EN 14181. AM0034 requires all key meters for the N2O determination to be	Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/QAL2/ /RAW/ /CAL/ /CoC/ /NATGAS/	subject to a quality control regime that will include regular maintenance and calibration according to the European Norm EN 14181. The analyzer has a QAL1 approval. The QAL 2 has been performed on 22/06/2012 to 25/06/2012 and 23/09/2014 to 25/09/2014 and 26/04/2017 to 28/04/2017 by Müller-BBM GmbH. The AST according to EN 14181 was performed on 03/07/2012 to 04/07/2012 and 06/08/2013 and 22/10/2013 to 24/10/2013 also by Müller-BBM GmbH as well as from 01/03/2016 to 02/03/2016 again by Müller-BBM GmbH. As per inital QAL2 report in 2007 the overall measurement accuracy is 0.70%. The overall measurement accuracy has only been established during initial QAL 2 as the vaue is not relevant as the combined error for VSG includes the error of TSG and PSG. The value from the pressure measurement device is used together with the actual temperature for the normalisation of the volume flow directly in the AMS. The thermocouple is connected to the AMS which automatically records the values every 2 seconds. The AMS also generates hourly data from the 2-sec data. The files are saved month-wise. Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to N.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The monitoring equipment has been checked physically during onsite visit. Besides interview with personnel has been conducted. Numerous QA/QC checks are implemented and foreseen, such as:		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		- EN 14181 compliance (QAL 1 to QAL 3, AST) including check of analytical function (zero and span check) - Regular checks by the plant maintenance team, - Service checks by the manufacturer and - Data checks by the CDM team			
		Conclusion: The monitoring procedure is as per reg PDD			
		☐	In this context the following findings have been raised:		
			☐ *N/A*		
			☐		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/ /CAL/ /CoC/ /NATGAS/	☐	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	Ok	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6		
		☐	No delayed calibration has occurred		
		☒	As per the initial assessment the monitored value is deemed to be correct.		
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		☒	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: 01/03/2017 End date of delay: 25/04/2017		
		☒	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☒	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☒	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☒	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☒	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			
H. EFn		Emission factor for campaign n				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/	*Description:* The emission factor for campaign n is calculated from parameter PEn an NAP as following: EFn = PEn / NAPn For the measurement method of the parameters PEn and NAP please refer to related checklist items. The value is calculated on monthly basis from the raw data in the technical manage log. The technical manager processes the raw data into the monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then			Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		forwarded to N.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report.			
		Verifier´s action: The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The procedure has been checked against reg PDD and MR as well as methodology and interview with personnel.			
		Conclusion: The monitoring procedure is as per reg PDD.			
		☐	In this context the following findings have been raised:		
			☐ *N/A*		
			☐		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/ /IM01/	☒	Not applicable as value is calculated.	Ok	OK
		☐	For details regarding the accuracy and calibration details please refer to Appendix 6		
		☐	No delayed calibration has occurred		
		☒	As per the initial assessment the monitored value is deemed to be correct.		
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			
I. EFma,n		Moving average emissions factor derived over time from campaign specific emissions factors				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/	*Description:* The moving average emission factor for campaign n is calculated from campaign specific emission factors EFn as following: EFma,n = (EF1+EF2+…+EFn) / n The value is only calculated after a campaign is finished from the data for the specific campaign. This value is calculated by N.serve. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report.			Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		*Verifier´s action:* The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The procedure has been checked against reg PDD and MR as well as methodology and interview with personnel.				
		Conclusion: The monitoring procedure is as per reg PDD.				
		☐	In this context the following findings have been raised:			
			☐	*N/A*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/ /IM01/	☒	Not applicable as value is calculated.		Ok	OK
		☐	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
				calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			
J. EFp		Emissions factor used for the specific campaign n to determine the emission reductions of that campaign				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/	*Description:* The emission factor for the specific campaign n to determine the emission reduction of that campaign is derived as following: If EFma,n > EFn then EFp = EFma,n If EFma,n < EFn then EFp = EFn The value is only calculated after a campaign is finished from the data for the specific campaign. This value is calculated by N.serve. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* The data in the final emission reduction			Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
method is in line with the registered monitoring plan of the PDD and the applied methodology.		calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The procedure has been checked against reg PDD and MR as well as methodology and interview with personnel.				
		Conclusion: The monitoring procedure is as per reg PDD.				
		☐	In this context the following findings have been raised:			
			☐	*N/A*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/ /IM01/	☒	Not applicable as value is calculated.		Ok	OK
		☐	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☒	In this context the following findings have been raised:			
			☐	N/A		
			☐			
K. EFmin		EFmin is equal to the lowest EFn observed during the first 10 campaigns of the project crediting period.				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/ /VER/	*Description:* The minimum emission factor for the first campaigns is determined as following: If EFmin = Min(EF1 to EF10) The value is only calculated once after the 10th campaign is finished from the data for the specific campaigns. As this monitoring period covers the 13th and 14th campaign the value is already determined. No update was conducted. This value was calculated by N.serve as N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* The data was checked against previous verification documents. The data in the final emission reduction calculation has been checked with the monthly files of the technical manager as well as raw data files from the AMS. The procedure			Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
		has been checked against reg PDD and MR as well as methodology and interview with personnel.				
		Conclusion: The monitoring procedure is as per reg PDD.				
		☐	In this context the following findings have been raised:			
			☐	*N/A*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/ /IM01/	☒	Not applicable as the value is calculated.		Ok	OK
		☐	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
				instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			
L. EFreg		Emissions cap for N2O from nitric acid production set by government regulation				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/MR/ /PDD/	*Description:* The emission factor derived from national regulations is observed by the PP. Currently there is no N2O regulation in place which affects the project activity.			Ok	OK
		Verifier´s action: The national legislation on N2O emissions and situation of the environmental laws related NOX emissions have been cross-checked by local expert. Following web articles have been checked http://www.sataxguide.co.za/category/carbon-tax				
		Conclusion: No (new) relevant legislation affecting the project activity in South Africa has been promulgated during the current monitoring period. Furthermore the environmental management system is certified acc. to ISO 14001. No host country legislation that would affect the project activity has changed.				
		☐	In this context the following findings have been raised:			

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☐	*N/A*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/	☒	Not applicable		Ok	OK
		☐	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		☐ calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals ☐ The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. ☒ In this context the following findings have been raised: ☐ N/A ☐		
M. CLn		Length of each project campaign measured in metric tonnes of 100% concentrated nitric acid produced during that campaign.		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/	*Description:* The length of each project campaign is determined in comparison with the established historic campaign length CLnormal as following: If CLn >= CLnormal then all N2O values measured during baseline campaign are to be used for calculation of EF If CLn < CLnormal then EFBL has to be recalculated by eliminating all N2O values obtained during production beyond CLn from the calculation of EFn. This determination is conducted after the end of a project campaign by N.serve. N.serve receives the operation data from the technical manager on weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* By means of checking MR, PDD, methodology and emission reduction calculation spreadsheet as well as interview with PPs. *Conclusion:* Based on onsite observation and document check, it can be confirmed that the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology and the value considered is deemed correct.	Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
		☐	In this context the following findings have been raised:			
			☐	*N/A*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/ /IM01/	☒	Not applicable as no measurement equipment is involved.		Ok	OK
		☐	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		☐ The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals ☐ The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. ☒ In this context the following findings have been raised: ☐ N/A ☐		
N. OPh		Oxidation pressure for each hour		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/ /CAL/	*Description:* The oxidation pressure is monitored by Yokogawa Press Tx – pressure transmitter serial number F576FB671708. The data is observed and recorded digitally by the process control system continuously. The PCS provides directly hourly average values. The pressure transmitters have an accuracy of 1.7%. The calibration is valid until the restart of the next campaign. This is due to practical means as the transmitters can only be dismounted when the plant is not in operation. For details see Appendix 6. Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to N.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* By means of checking calibration certificates, MR, reg PDD as well	Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		as ER spreadsheet and technical manager log and interview with PP.			
		Conclusion: The measurement procedure and data aggregation is as per reg PDD. QA/QC procedures were established and requirements are fulfilled. The monitoring equipment was duly calibrated for this entire monitoring period. However delay in calibration has been identified. The parameter has no influence on the ER calculation therefore no adjustment was required.			
		☐	In this context the following findings have been raised:		
			☐ *N/A*		
			☐		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/CAL/ /PDD/ /MR/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	Ok	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6		
		☒	No delayed calibration has occurred		
		☒	As per the initial assessment the monitored value is deemed to be correct.		
		☒	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		☐	A delay in calibration has been identified, the PP applied		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		related actions and therefore the DOE can confirm that the: ☐ The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration ☐ The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument ☐ The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument ☐ The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals ☐ The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. ☐ In this context the following findings have been raised: ☐ N/A ☐		
O. OTh		Oxidation temperature in the ammonia oxidation reactor (AOR) for each hour		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/	*Description:* The oxidation temp. is monitored by thermocouple K310 S/steel serial number TP3285-3290 and TAG number 76159-1 to -5. The data is observed and recorded digitally by the process control system continuously. The PCS provides directly hourly average values. The thermocouples have an accuracy of +/-1.0%. The calibration is valid until the restart of the next campaign. This is due to practical means as the thermocouples can only be dismounted when the plant is not in operation. Therefore delay in calibration has been identified as per Appendix 6 of this report.	~~CAR E.6.2.1~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to N.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report.				
		Verifier´s action: By means of checking calibration certificates, MR, reg PDD as well as Er spreadsheet and technical manager log and interview with PP.				
		Conclusion: The measurement procedure and data aggregation is as per reg PDD. QA/QC procedures were established and requirements are fulfilled.				
		☒	In this context the following findings have been raised:			
			☒	*CAR E.6.2.1*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /PDD/ /MR/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan		~~CAR E.6.2.1~~	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☒	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☒	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.		☐ Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY ☐ A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the: ☐ The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration ☐ The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument ☐ The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument ☐ The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals ☐ The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. ☒ In this context the following findings have been raised: ☒ *CAR E.6.2.1* ☐		
P. AFR		Ammonia gas flow rate to the ammonia oxidation reactor		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation*	/IM01/ /PDD/ /AM34/	*Description:* The ammonia gas flow rate is continuously monitored by orifice plate differential pressure transmitter Yokogawa serial number F570FD073708. The data is observed and recorded digitally by the process control system continuously. The PCS provides directly hourly average values.	Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/QAL2/ /QAL3/ /CAL/	The accuracy of the equipment is 1.25%. The calibration is valid until the restart of the next campaign. This is due to practical means as the thermocouples can only be dismounted when the plant is not in operation. Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to N.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report.			
		Verifier´s action: By means of checking calibration certificates, MR, reg PDD as well as ER spreadsheet and technical manager log and interview with PP.			
		Conclusion: The measurement procedure and data aggregation is as per reg PDD. QA/QC procedures were established and requirements are fulfilled.			
		☐	In this context the following findings have been raised:		
			☐ *N/A*		
			☐		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/MR/ /PDD/ /CAL/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	Ok	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6		
		☒	No delayed calibration has occurred		
		☒	As per the initial assessment the monitored value is deemed		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*			to be correct.			
		☒	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Q. AIFR		Ammonia to air ratio into the ammonia oxidation reactor		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/ /QAL2/ /CAL/	*Description:* The ammonia to air ratio is calculated based on results from parameter AFR and monitoring of air flow rate. Air flow rate is monitored continuously by orifice plate differential pressure transmitter Endress & Hauser Deltabar S serial number JA08710109D which has been exchanged to Endress and Hauser FT-76002-1. The data is observed and recorded digitally by the process control system continuously. The PCS provides directly hourly average values. The accuracy of the Endress & Hauser Deltabar S equipment is 1.25%. The calibration is valid until the restart of the next campaign. This is due to practical means as the thermocouples can only be dismounted when the plant is not in operation. Every Friday the data is transferred on a portable hard disk by the instrument engineer and also handed over to the technical manager. The technical manager archives the data on his computer. The technical manager processes the data into a monthly file which includes, shut down details, raw data from SCADA, pre-calculation of the related CDM data and ER, chart of the NCSG and daily NAP data. This monthly file is then forwarded to N.serve on a weekly basis. N.serve is processing the data and calculating the final emission reductions which are stated in the monitoring report. *Verifier´s action:* By means of checking calibration certificates, MR, reg PDD as well as Er spreadsheet and technical manager log and interview with PP. *Conclusion:* The measurement procedure and data aggregation is as per reg PDD. QA/QC procedures were established and requirements are fulfilled. ☐ In this context the following findings have been raised: ☐ *N/A*	Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/CAL/ /PDD/ /MR/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan		Ok	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☒	No delayed calibration has occurred			
		☒	As per the initial assessment the monitored value is deemed to be correct.			
		☒	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☐	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
				reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			
R. GSproject		Gauze supplier for the project campaign				
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /GC/	*Description:* Is monitored / invoices received from the supplier of the gauze, for this monitoring period W.C. Heraeus.			Ok	OK
		Verifier´s action: By means of checking PDD as well as related invoice from gauze supplier as well as site observation and interview with personnel.				
		Conclusion: Ok based on related docsuments provided.				
		☐	In this context the following findings have been raised:			
			☐	*N/A*		
			☐			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring*	/PDD/ /MR/	☒	No measurement and crosscheck required.		Ok	OK
		☐	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred			
		☐	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for			

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
equipment has been carried out in line with the latest EB guidance. *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*				this entire monitoring period.		
		☐		Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		☐		A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐		In this context the following findings have been raised:		
			☐	N/A		
			☐			
S. GCproject		Gauze composition during the project campaign expressed as % by weight of the precious metals Platinum, Rhodium and, if applicable, Palladium comprising the Ammonia Oxidation Catalyst gauzes.				

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PDD/ /AM34/ /MR/ /GC/	*Description:* The gauze composition for this monitoring period is given with PC18: 56% Pt, 4% Rh and 40% Pd. PC19: 56% Pt, 4% Rh and 40% Pd. PC20: 56% Pt, 4% Rh and 40% Pd. *Verifier´s action:* By means of checking the invoice of the supplier. *Conclusion:* The gauze compistion is stated as per related invoice of the supplier. ☐ In this context the following findings have been raised: ☐ *N/A* ☐	Ok	OK
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/GC/ /PDD/ /MR/	☒ Not applicable as this parameter is not monitored by measurement equipment. ☐ For details regarding the accuracy and calibration details please refer to Appendix 6 ☐ No delayed calibration has occurred ☒ As per the initial assessment the monitored value is deemed to be correct. ☐ Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period. ☐ Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY	Ok	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
		☐	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☐	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			☐	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☐	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			☐	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☐	In this context the following findings have been raised:			
			☐	N/A		
			☐			

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
Emission analyzer	NCSG	3.346857.7	ABB AO2040 URAS 14	1.60% as per 2014 QAL2 and 2.12% as per 2017 QAL2	23/09/2014[2,3] 01/03/2016[3]	26/04/2017[2,3]	QAL2 every 5 years AST every year	☐ No ☒ Yes	From: 01/03/2017 To: 25/04/2017
Gas flow meter /FT-76550/	VSG	817087	Emerson Rosemount Anubar	2.082% as 2014 QAL2 and 1.451% as per 2017 QAL 2	23/09/2014[2,3] 01/03/2016[3]	26/04/2017[2,3]	QAL2 every 5 years AST every year	☐ No ☒ Yes	From: 01/03/2017 To: 25/04/2017
Stack pressure	PSG	-	Emerson Rosemount	10mbar	23/09/2014[2,3]	26/04/2017[2,3]	1 year	☐ No	From: 01/03/2017

[2] Related QAL2 and AST as the monitoring equipment is included in the tests as per EN 14181
[3] AST

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
probe /PT-76506/			Anubar		01/03/2016[3]			☒ Yes	To: 25/04/2017
Stack temperature probe /TE-76170/	TSG		Emerson Rosemount Anubar	5°C	23/09/2014[2,3] 01/03/2016[3]	26/04/2017[2,3]	1 year	☐ No ☒ Yes	From: 01/03/2017 To: 25/04/2017
				2.55% as per QAL2 2014 2.12% as per 2017 QAL2	23/09/2014[2,3] 01/03/2016[3]	26/04/2017[2,3]	1 year	☐ No ☒ Yes	From: 01/03/2017 To: 25/04/2017
Nitric acid flow meter /FT-76010/	NAP	11007573	Emerson coriolis flow meter CMF300	<=0.1%	19/04/2014	-	No subsequent calibration required as per manufacturer	☒ No ☐ Yes	From: To:
		14740820	Emerson coriolis flow meter CMF300	<=0.1%	05/11/2017	-		☒ No ☐ Yes	From: To:
Pressure probe /PT-76002-1/	OPh	F576FB671708	Yokogawa Oress Tx	1.7%	11/11/2015	19/08/2016 03/04/2017 31/07/2017	For one campaign	☒ No ☐ Yes	From: To:
Thermocouples	OTh	TP3285-3290	K310 S/steel	±1%	11/11/2015	19/08/2016	For one campaign	☒ No	From:

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
/TC76159-1 to -5 /			Thermocouple			03/04/2017 31/07/2017		☐ Yes	To:
Pressure measurement /FT-76003-1/	AFR	F570FD073708	Yokogawa Orifice plate with D.P. transmitter	1.25%	11/11/2015	19/08/2016 03/04/2017 31/07/2017	For one campaign	☒ No ☐ Yes	From: To:
Flow meter /FT-76002-1/	AIFR	JA08710109D	Deltabar S Endress + Hauser PMD75	1.25%	11/11/2015	19/08/2016 03/04/2017 31/07/2017	For one campaign	☒ No ☐ Yes	From: To:

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Document information

Version	*Date*	*Description*
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: project activities, verifying and certifying