



Verification and certification report form for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the verification and certification report form for CDM project activities" at the end of this form.

VERIFICATION AND CERTIFICATION REPORT

Title of the project activity	N2O ABATEMENT PROJECT AT NITRIC ACID PLANT NO. 11 AT AFRICAN EXPLOSIVES LTD. (AEL), SOUTH AFRICA
Reference number of the project activity	UNFCCC ID: 1364 TN P-No. : 8000469537 – 17/016
Version number of the verification and certification report	1.0
Completion date of the verification and certification report	27/03/2017
Monitoring period number and duration of this monitoring period	MP 9 06/01/2016 – 17/08/2016
Version number of monitoring report to which this report applies	02
Crediting period of the project activity corresponding to this monitoring period	08/02/2008 – 07/02/2018 (including both days)
Project participant(s)	AEL Mining Services Limited N.serve Environmental Services GmbH Nordic Environment Finance Corporation
Host Party	South Africa
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Scope: 5 / Technical Area: 5.2 CDM Methodology: AM0034 ver.2 "Catalytic reduction of N2O inside the ammonia burner of nitric acid plants"
Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD	188,694 t CO _{2e}
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	148,609 t CO _{2e}
Name of DOE	TÜV NORD CERT GmbH
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 the 8th 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 from 06/01/2016 to 17/08/2016 (including both days).

The project activity aims to reduce levels of N₂O emissions from the production of nitric acid with secondary N₂O 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 / Modderfontein
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, i.e., AM0034 ver. 2
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 9th periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: 148,609 t CO₂e

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 review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	Winter	Stefan	TÜV NORD CERT	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	IR	Stöhr	Christina	TÜV NORD CERT
2.	Technical Reviewer/Approver	IR	Winter	Rainer	TÜV NORD CERT

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 %	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	Check of monitoring equipment, esp. with regards to appropriateness

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

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	
			<i>results</i>	<i>of the location</i>
2.	<i>Dysfunction of installed equipment</i>	<i>Medium</i>	<i>Dysfunction of equipment might lead to wrong measuring results</i>	<i>Check of operational data</i>
3.	<i>Exchange of measurement equipment</i>	<i>Medium</i>	<i>Exchange of measurement equipment might lead to incorrect data processing</i>	<i>Check of serial-numbers of installed measurement equipment</i>
4.	<i>Wrong or insufficient quality assurance of monitoring equipment</i>	<i>High</i>	<i>Wrong or insufficient QA/QC might lead to incorrect monitoring results</i>	<i>Check of</i> - calibration intervals - calibration certificates - QAL 2 report - QAL 3 records - Qualification records of involved entities and personnel
5.	<i>Mismatch or wrong implementation of formulae and algorithms</i>	<i>Medium</i>	<i>It has to be ensured that e.g. calibration functions are correctly implemented</i>	<i>Check of data aggregation trails, spreadsheet programming, IT Systems etc.</i>
6.	<i>Incomplete data</i>	<i>High</i>	<i>Data gaps shall be addressed in line with applicable rules</i>	<i>The completeness of data was checked in detail during the on-site visit. Further crosschecking was done to ensure data quality.</i>
7.	<i>Mistakes in data transfer</i>	<i>High</i>	<i>The likeliness of data transfer mistakes is considered low where automatic procedures are applied and high where manual aggregation is required</i>	<i>Check of</i> - Data aggregation trails - IT systems - Spreadsheet programming - Data protection measures - responsibilities
8.	<i>Wrong usage of emission factors, coefficients etc.</i>	<i>Low</i>	<i>Such factors may not be applicable for current conditions</i>	<i>Check of relevant parameters, e.g. GWP, molecular masses etc.</i>

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 site visit.

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	Corrected	Remaining verification risk
NCSG	COM	☒	CAR 2	☒	Not material
VSG	COM	☒	CAR 2	☒	Not material

Parameter	Approach ⁺	Errors* detected	Findings reference	Corrected	Remaining verification risk
PE_n	CDC	☒	CAR 2 CL 1 CL 2	☒	Not material
OH_n	CDC	☐		☐	Not material
NAP	CDC	☒	CL 2	☒	Not material
TSG	COM	☒	CAR 2	☒	Not material
PSG	COM	☒	CAR 2	☒	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	☒	CL 01	☒	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 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: 22/02/2017 to 23/02/2017				
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	22/02/2017	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		
	Site/Plant Visit: • Control room • Analyzer cabinet • Field equipment • Laboratory	AEL Mining Ltd		
5.	Data analysis and calculation: • Raw data analysis • Check of DCS programming • Check of ER calculation • Counter calculation	AEL Mining Ltd	23/02/2017	
6.	Check of additional evidences: • Technical data of the plant • Situation of legislation	AEL Mining Ltd		
7.	Quality Management System: • Check of ISO certificates • Calibration procedure • Data storage/Back-up • Data aggregation and processing • Qualification of personnel	AEL Mining Ltd		
8.	Closing meeting	AEL Mining Ltd		

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Burger	Hendrik	AEL	22 and 23/02/2017	All issues	Stefan Winter, Gregor Kochaniewicz
2.	Gutknecht-Stöhr	Niko	n.serve			
3.	Klopper	Qinton	AEL Reliability	22/02/2017	Training for QAL3, QAL3	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
			Team Member		test conducted	
4.	Ndebele	Menzi	AEL Process Controller	22/02/2017	Production process control, showing how to take sample for Acid density and temp. For concentration	

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
	<i>n.a.</i>				

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage 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	225 days / hourly data 5,400 / 2s data logging 9,720,000	hourly data 359 / 2s data logging 385
	VSG	SiRS	COM		
	TSG	SiRS	COM		
	PSG	SiRS	COM		
	OT _h	SiRS	COM		
	OP _h	SiRS	COM		
	AFR	SiRS	COM		
	AFIR	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	5,400 (225 days x 24 h/d)	359	2 months = 1440 hours
2 sec raw data for OTh, OPh, AFR, AFIR, NCSG, VSG, PSG and TSG	9,720,000 (225 days x 24 h/d x 3,600 s/h / 2)	385	500

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form (E.1)	-	-	-
Compliance of the project implementation with the registered PDD (E.3)	-	-	-
Post-registration changes (E.4)	-	-	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline (E.5)	-	-	-
Compliance of monitoring activities with the registered monitoring plan (E.6)	1	-	-
Compliance with the calibration frequency requirements for measuring instruments (E.7)	1	-	1
Assessment of data and calculation of emission reductions or net removals (E.8)	-	-	-
Others (please specify: Instructions to fill MR and missing documents)	-	2	-
Total	2	2	0

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:
		-
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.
	The provided MR is in compliance with related requirements.	

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

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

Three FARs have been raised during last verification. During site visit for this monitoring period the related issues have been checked and it could be confirmed that the related issues have been resolved. Please refer to FAR ID 01 to ID 03 under Table 3. in Appendix 4 of this report for further details.

E.3. Compliance of the project implementation 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 it 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/ • /TS/ • /QAL1/, /QAL2/, /QAL3/ • /LOG/ • /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:
		-
	<i>In case of phased implementation:</i>	

	☒	N/A
	☐	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	☐	The description in section 3.1 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
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.
	The project is implemented as per description provided in the registered PDD.	

E.4. Post-registration changes

- ☒ By means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered PDD and the applied methodology.
- ☐ Post registration changes have been identified and are assessed in detail in the subsequent steps E.4.1 to E.4.7.

E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

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. Changes to the start date of the crediting period

☒	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 § 277 and § 278 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 § 279 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 to a registered project activity

☒	N/A - as this monitoring plan was part of the registered PDD
☐	In line with PS § 281 or § 282 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 § 282 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 § 282 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, monitoring methodology or standardized baseline

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 of a registered project activity

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. Types of changes specific to afforestation and reforestation project activities

☒	N/A - as this monitoring plan was part of the registered PDD
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E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

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: <table border="1" data-bbox="534 772 1407 996"> <tr> <td data-bbox="534 772 606 840">1</td><td data-bbox="606 772 853 840">Title (of the tool)</td><td data-bbox="853 772 1407 840">Tool for demonstration and assessment of additionality</td></tr> <tr> <td data-bbox="534 840 606 884"></td><td data-bbox="606 840 853 884">Version</td><td data-bbox="853 840 1407 884">7.0.0</td></tr> <tr> <td data-bbox="534 884 606 996"></td><td data-bbox="606 884 853 996">MP compliance</td><td data-bbox="853 884 1407 996"> ☒ full compliance ☐ findings have been raised ☐ N/A (for MP) </td></tr> </table>		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)
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)										
	☐	The breakdown of MP accordance of the applicable SB is as follows: <table border="1" data-bbox="534 1019 1407 1198"> <tr> <td data-bbox="534 1019 606 1064">1</td><td data-bbox="606 1019 853 1064">Title (of the SB)</td><td data-bbox="853 1019 1407 1064">Name of SB</td></tr> <tr> <td data-bbox="534 1064 606 1108"></td><td data-bbox="606 1064 853 1108">Version</td><td data-bbox="853 1064 1407 1108"></td></tr> <tr> <td data-bbox="534 1108 606 1198"></td><td data-bbox="606 1108 853 1198">MP compliance</td><td data-bbox="853 1108 1407 1198"> ☐ full compliance ☐ findings have been raised ☐ N/A </td></tr> </table>		1	Title (of the SB)	Name of SB		Version			MP compliance	☐ full compliance ☐ findings have been raised ☐ N/A
1	Title (of the SB)	Name of SB										
	Version											
	MP compliance	☐ full compliance ☐ findings have been raised ☐ 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. 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 sources of information have been used in this context:
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	• /MR/ • /XLS/ • /PDD/, /VER/ • /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.
		The following values are fixed ex-ante: B.1 NCSG_{BC}: 1,630.03 mg/Nm³ B.2 VSG_{BC}: 72,468 Nm³/h B.3 BE_{BC}: 651.983 tN₂O; B.4 OH_{BC}: 4,950 h B.5 NAP_{BC}: 134,700 tHNO₃ B.6 TSG: n.a. °C B.7 PSG: n.a. PA (absolute) B.8 EF_{BL}: 0.004647 tN₂O / tHNO₃; B.9 UNC: 3.99 % B.10 AFR: Not applicable, monitored data of AFR will be used to determine if plant was operating outside of AFR_{max}. B.11 AFR_{max}: 9.094 tNH₃/h (converted from originally measured Nm³/h) B.12 AIFR: 8.3 to 11.5 (AIFR will be used to determine AIFR_{max}). B.13 CL_{BL}: 134,700 tHNO₃ B.14 CL_{normal}: 127,302.4 tHNO₃ B.15 AIFR_{max}: 11.5 %v/v B.16 OT_h: n.a. B.17 OT_{normal}: 820 to 905 °C (min and max) B.18 OP_h: n.a. kPa B.19 OP_{normal}: 365 – 450 kPa (gauge) min and max B.20 GS_{normal}: W.C. Heraeus Name of Supplier B.21 GS_{BL}: W.C. Heraeus Name of Supplier B.23 GC_{normal}: Platinum (Pt) 56.5%; Rhodium (Rh) 3.8%; Palladium (Pd) 39.7%

	Record of Gauze compositions installed during the historic campaigns:				
	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
	B.24 GC_{BL}: Platinum (Pt) 56%; Rhodium (Rh) 3.8%; Palladium (Pd) 40.2%				
B.26 EF_{reg}: None tN₂O/tHNO₃					
The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly. The values have been crosschecked with the registered latest version of PDD, previous verification documents such as MR and verification report as well as further supporting documents e.g. log book.					

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 CL 01 and CL 02 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.
	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/, /TS/.		
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: - CL 01 and CL 02 and FAR 01 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 and 6.	
	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 as 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. This has to be considered for next verification.
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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: • <i>Transparency:</i> It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • <i>Parameter consistency:</i> 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. • <i>Correctness:</i> 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. • <i>Completeness:</i> It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/ • /XLS/.						
Findings	<table border="1"> <tr> <td>☒</td><td> 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. </td></tr> <tr> <td>☐</td><td>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</td></tr> <tr> <td>☐</td><td>In this context the following CARs, CLs, FARs have been raised:</td></tr> </table>	☒	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:
☒	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:						
Conclusion	<table border="1"> <tr> <td>☒</td><td>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</td></tr> <tr> <td>☐</td><td>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.</td></tr> </table> Where corrections were 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: $ER_y = BE_y - PE_y - LE_y$ $ER_y = (EF_{BL} - EF_p) \times NAP \times 10^{-3} \times GWP_{N_2O}$ With EF_{BL} depending on CL_n in comparison to CL_{normal}. For this monitoring period EF_{BL} is	☒	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 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.						

Campaign	CL _n comparison with CL _{normal} and CL _{BL} if required	EFBL value [tN ₂ O/tHNO ₃]
PC17	CL _n > CL _{normal}	0.0004647
The plant specific baseline emission factor is calculated as following: $EF_{BL} = (BE_{BC} / NAP_{BC}) \times (1 - UNC/100)$ With determined via: $BE_{BC} = VSG_{BC} \times NCSG_{BC} \times 10^{-9} \times OH_{BC}$		

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/ • /XLS/.	
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:
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 were 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: $ER_y = BE_y - PE_y - LE_y$ $ER_y = (EF_{BL} - EF_p) \times NAP \times 10^{-3} \times GWP_{N_2O}$ With EF_p to be determined as following: $EF_p = EF_{ma,n} \text{ if } EF_{ma,n} > EF_n \text{ or } EF_p = EF_n \text{ if } EF_{ma,n} < EF_n$ $EF_{ma,n} = (EF_1 + EF_2 + \dots + EF_n) / n$ $EF_n = PE_n / NAP_n$ $PE_n = VSG \times NCSG \times 10^{-9} \times OH$		

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.
	Where corrections were required a revised LE 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. 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 in 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: CL 01 and CL 02								
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.								
		$ER_y = BE_y - PE_y - LE_y$ $ER_y = (EF_{BL} - EF_p) \times NAP \times 10^{-3} \times GWP_{N_2O}$ $= (4.647 \text{ kg N}_2\text{O/t HNO}_3 - 1.290 \text{ kg N}_2\text{O/t HNO}_3) \times 148,526 \text{ t HNO}_3 \times 10^{-3} \times 298 \text{ tCO}_2\text{e/tN}_2\text{O}$ $= 148,609 \text{ tCO}_2\text{e}$ 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: <table border="1" data-bbox="485 875 1404 1016"> <thead> <tr> <th>Campaign</th><th>Baseline Emissions [tCO₂e]</th><th>Project Emissions [tCO₂e]</th><th>Emission Reductions [tCO₂e]</th></tr> </thead> <tbody> <tr> <td>PC17</td><td>205,686</td><td>57,076</td><td>148,609</td></tr> </tbody> </table>	Campaign	Baseline Emissions [tCO ₂ e]	Project Emissions [tCO ₂ e]	Emission Reductions [tCO ₂ e]	PC17	205,686	57,076	148,609
	Campaign	Baseline Emissions [tCO ₂ e]	Project Emissions [tCO ₂ e]	Emission Reductions [tCO ₂ e]						
PC17	205,686	57,076	148,609							

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 (E.8.5) 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.
	n.a.	

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 title page as well as chapter E.4 of the MR and the emission reduction calculation sheet /XLS/.											
Findings	☒ The MR on title page and in section E.4 includes a summary table of the ER breakdown a) ER up to 2012-12-31 and b) ER from 2013-01-01 onwards											
	☒ The breakdown of the ERs during the first commitment period and from 2013-01-01 onwards is as follows: ☐ The ER have completely been generated during the first commitment period ☒ The ERs have completely been generated from 2013-01-01 onwards, ☐ The ERs have partly been generated during the first commitment period and partly from 2013-01-01 onwards.											
	☒ The breakdown of the ERs is correct, considering the applicable guidance.											
	<table><tr><td></td><td>until 2012-12-31 ¹⁾</td><td>from 2013-01-01 ¹⁾</td><td>Sum</td></tr><tr><td>Emission reductions [tCO_{2e}]</td><td>-</td><td>148,609</td><td>148,609</td></tr></table>					until 2012-12-31 ¹⁾	from 2013-01-01 ¹⁾	Sum	Emission reductions [tCO _{2e}]	-	148,609	148,609
		until 2012-12-31 ¹⁾	from 2013-01-01 ¹⁾	Sum								
Emission reductions [tCO _{2e}]	-	148,609	148,609									
¹⁾ Both days included												
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. No pro-rata approach was required as the entire emission reductions have been achieved after 01/01/2013.											

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 9th 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 06/01/2016 to 17/08/2016 (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, i.e., AM0034 ver. 2,
- 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 follows:

Emission reductions: 148,609 t CO_{2e}.

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.: 9

from: 06/01/2016

to: 17/08/2016

(including both days) as follows:

Emission reductions: 148,609 t CO_{2e}.

Essen, 27/03/2017



Stefan Winter
Team leader

Appendix 1. Abbreviations

Abbreviations	Full texts
AEL	AEL Mining Services Limited
CA	Corrective Action / Clarification Action
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)
IM	Interview Memo
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
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

TUV NORD
Certification

Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27

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
8.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 4, Date: 2015-01-05

163_001-VA050-F20_2015-01-05_rev4.docx 001-VA050-F20 rev3 / 2012-10-25

TUV NORD
Certification

Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM 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_001-VA050-F20_2016-02-09_rev7.docx 001-VA050-F20 rev3 / 2012-10-25

TUV NORD
Certification

Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM Certification Program

Mr. Rainer Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-07-01
JL	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	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_001-VA050-F20_2016-07-01_rev10.docx 001-VA050-F20 rev3 / 2012-10-25

TUV NORD
Certification

Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM Certification Program

Ms. Christina Stöhr

SCHEME	STATUS	VALID UNTIL
CDM	Assessor (Validation, Verification) Technical Reviewer	2017-12-12
VCS / ISO 14064-2	Assessor/ Technical Reviewer	

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
13.1	Solid waste and wastewater

200 - Rev. 4 Date: 2015-06-09

200_001-VA050-F20_2014-12-13_rev4.docx 001-VA050-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 N ₂ O inside the ammonia burner of nitric acid plants", version 2		Other
2	DOE	/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
3	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
4	UNFCCC	/KPI/	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
5	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
6	PP	/MR/	Monitoring Report for CDM project: "N ₂ O ABATEMENT PROJECT AT NITRIC ACID PLANT NO. 11 AT AFRICAN EXPLOSIVES LTD. (AEL), SOUTH AFRICA" version 1, dated 27/01/2017 version 2, dated 28/02/2017		Other
7	UNFCCC	/MRT/	Monitoring Report Form (CDM-MR-FORM), Version 5.1	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
8	UNFCCC	/PDD/	Project Design Document for CDM project: "N ₂ O ABATEMENT PROJECT AT NITRIC ACID PLANT NO. 11 AT AFRICAN EXPLOSIVES LTD. (AEL), SOUTH AFRICA" version 2, dated 08/07/2016		Other
9	UNFCCC	/PSI/	CDM Project Standard (Version 9.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
10	PP	/VAL/	Validation Report for CDM project "N ₂ O 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 "N ₂ O 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
11	PP	/VER/	Documents of previous verifications		Other

No.	Author	Reference	Title	References to the document	Provider
			(Monitoring report, verification report, ER calculation sheet)		
12	UNFCCC	/VVS/	CDM Validation and Verification Standard (Version 09.0)	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 03.0) “Standard for Sampling and Surveys for CDM Project Activities and Programme Activities” (version 4.1)	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other
14	UNFCCC	/TA/	• Tool to calculate baseline, project and/or leakage emissions from electricity consumption Version 1 • Tool to calculate the emission factor for an electricity system Version 4.0 • Tool to determine the mass flow of a greenhouse gas in a gaseous stream Version 2.0.0 • Upstream leakage emissions associated with fossil fuel use Version 2.0	http://cdm.unfccc.int/Reference/tools/index.html	Other
15	UNFCCC	/GOT/	Glossary “CDM terms” (version 08.0)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
16	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
17	PP	/BR/	Breakdown reports		PP
18	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 • Tax invoice for E+H differential pressure flow meter		PP

No.	Author	Reference	Title	References to the document	Provider
			Tax invoice for new ABB sampler		
19	Linde Group	/CoC/	Certificate of Conformance for Test Gases: N ₂ O, Nitrogen (zero and span gas)		PP
20	PP	/FSNA/	Flow Sheet Nitric Acid Plant		PP
21	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” - 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: Education, Training and Development - List of local standards in South Africa	https://www.sabs.co.za/BusinessUnits/Standards_SA/SABSTAN/STANDARDS_DEVELOPMENT/Published_Standards/PS070.PDF	PP
22	PP	/LOG/	Record log sheet of operator including main operation data and HNO ₃ temperature and density taken by manual measurement and concentration.		PP
23	PP	/NATGAS/	Gas Composition Specification for calibration gas for NO, NO _x and N ₂ O		PP
24		/OCS/	Actual operating condition values of the N ₂ O destruction facility during the on-site visit.		PP
25	PP	/P&I/	P&I Diagram		PP
26	PP	/PPT/	Presentation of the company AEL Mining Services Ltd. and production facilities		PP
27	PP	/PROD/	Production data for the period January 2016 to August 2016 on monthly basis Nitrates balance for year 2016		PP
28	TÜV SÜD	/QAL1/	Suitability testing report by TÜV SÜD, Germany, report no. 2410 6657 and 170 608 dated June 2006		PP
29	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		PP
30	PP	/QAL3/	Daily and Monthly Check log sheets		PP

No.	Author	Reference	Title	References to the document	Provider
			for the Emerson N ₂ O analysers		
31	PP	/RAW/	Raw data: Hourly and monthly summarized data from AMS Technical Managers log spreadsheet		PP
32	PP	/Train/	Training protocols for the operation of the Monitoring System esp. the Analyser. QAL3 training and attendance register		PP
33	PP	/TS/	Technical data sheets of installed monitoring equipment		PP
34	PP	/XLS/	Initial emission reduction calculation spreadsheet ver 1 and final emission reduction calculation spreadsheet ver 2		PP

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

Table 3. Remaining FAR from validation and/or previous verification

FAR ID	01	Section No.	E	Date: 16/03/2016
Description of FAR				
FAR is raised as there is delay in calibration due to delayed AST from 23/09/2015 to 01/03/2016 however the monitoring period ends 05/01/2016 and there is remaining delay in calibration from 06/01/2016 to 01/03/2016 which is to be considered during next monitoring period and verification.				
Project participant response				Date: 27/01/2017
The calibration delay due to the delayed AST was considered in ER calculation.				
Documentation provided by project participant				
☐ Changes in the PDD		Section(s):		New version No.:
☐ Changes in MR		Section(s):		New version No.:
☐ Changes in XLS		Worksheet(s):		New version No.:
☒ Other: ER calc spreadsheet				
DOE assessment				Date: 23/02/2017
DOE has checked provided ER calculation spreadsheet and can confirm that the maximum permissible error has been conservatively applied to the values for the related period. As the AST was delayed the parameters NCSG and VSG have been conservatively adjusted. Therefore this FAR is closed.				
Conclusion <i>Tick the appropriate checkbox</i>		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

FAR ID	02	Section No.	C, D.2	Date: 16/03/2016
Description of FAR				
As per interview with EDTP (Education Development Training Practizener) currently only one person is qualified for maintenance and calibration (QAL3) on the N2O analyzer. It is to be checked during next verification that at least one more person is qualified to ensure that QAL3 is conducted in case of holiday, illness etc of the first person.				
Project participant response				Date: 17/03/2017
The manufacturer of the analyzer (ABB) has conducted the training on maintenance and calibration on 07/02/2017. The attendance sheet for the training has been submitted and the following AEL employees participated: - Poki Motshegwa - Quinton Klopper - Donald Maseko - Bhekile Langa - Phule Molefe - Lawrence Malatff				
Documentation provided by project participant				
☐ Changes in the PDD		Section(s):		New version No.:
☐ Changes in MR		Section(s):		New version No.:
☐ Changes in XLS		Worksheet(s):		New version No.:
☐ Other:				
DOE assessment				Date: 17/03/2017
As per interview with one person participating the training, Qinton Klopper, during onsite inspection it has been confirmed that the training took place on 07/02/2017 conducted by service provider ABB. During onsite inspection the assessment team could confirm that his superior explained him the analyzer and how to check and conduct the QAL3 test. Further the related training attendance sheet has been provided which confirms the participation of the above stated persons.				
Conclusion <i>Tick the appropriate checkbox</i>		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

FAR ID	03	Section No.	PDD	Date: 16/03/2016
Description of FAR				
As per related methodology the baseline for the project activity has to be established through continuous monitoring for one complete campaign prior to project implementation. This has been done by the PP correctly and the related values have verified during the first subsequent periodic verification of the project activity^{VER/}. As the current latest PDD on the corresponding UNFCCC project webpage was finished prior to commencement of the baseline campaign the values for the baseline campaign shown in the latest PDD are not as per results of the baseline campaign received. These values are to be found in the related verification report of the first periodic verification. Therefore this FAR has been raised in order to revise the PDD to correct the related values as per results of the baseline campaign and as stated in the verification report of the first periodic verification.				
Project participant response				Date: 22/02/2017
The PRC was approved on 13/02/2017.				
Documentation provided by project participant				
☐	Changes in the PDD	Section(s):	New version No.:	
☐	Changes in MR	Section(s):	New version No.:	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
DOE assessment				Date: 23/02/2017
As per Email by UNFCCC and project webpage at UNFCCC the related PRC has been approved on 13/02/2017 via approval number PRC1364-001. Finding closed.				
Conclusion Tick the appropriate checkbox		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Table 4. CL from this verification

CL ID	01	Section no.	D.2	Date: 23/02/2017
Description of CL				
For measurement equipment PT-76002-1, FT-76003-1 and TC-76159-1 to TC-76159-5 the MR requires calibration frequency of "Once every campaign" and validity is given with "valid until the restart of the plant after gauze change". However last two calibrations have been conducted on 11/11/2015 and 19/08/2016 which are both outside this campaign period. Clarify how the calibration frequency and validity stated in MR is met.				
Project participant response (1st round)				Date: 01/03/2017
The equipment was calibrated during a plant shut down on 11/11/2015. According to the specifications, this calibration was only valid until the gauze change on 06-07/01/2016. However, the subsequent calibration was only conducted during the next gauze change on 19/08/2016. Therefore, the calibration was delayed from 07/01/2016 until 19/08/2016. The parameter OT_h is used in the emission reduction calculation in order to determine if the plant is online or offline. In order to adhere the guidelines for assessing compliance with the calibration frequency requirements as stipulated in paragraph 395 of VVS the maximum permissible error of the instruments for OT_h was applied in a conservative manner. Usually, the plant is considered online at temperatures above 820°C. The maximum permissible error is 0.4%, which has been deducted, resulting in a lower limit of 816.72°C, under which the plant is considered offline. While this has an increasing effect on the operating hours, the resulting emission reductions are lower than before the correction. The parameters OP_h, AFR and AIFR have no effect on the emission reduction calculation and therefore no correction was needed.				
Documentation provided by project participant (1st round)				
☐	Changes in the PDD	Section(s):	New version No.:	
☒	Changes in MR	Section(s):	New version No.: 2	
☒	Changes in XLS	Worksheet(s): ZA1364_ER_calc_V02_MP_9_170227.xlsx	New version No.: 2	
☐	Other:			
DOE assessment (1st round)				Date: 16/03/2017
Ok. No subsequent calibration has been conducted during the campaign related to this monitoring				

period. As checked during site visit by interview and based on document check the related temp measurement equipment has been exchanged during gauze change after the end of the campaign related to this monitoring period. Therefore delay in calibration has been identified for the period from 07/01/2016 to 19/08/2016. As new equipment has been installed the "delayed calibration" is within the required accuracy and the maximum permissible error of 0.4% has conservatively applied to the ER calculation leading to lower ER result as checked with the updated ER spreadsheet provided.

The other equipment has also been exchanged but is not used for ER calculation during the monitoring period and monitoring campaigns.

Therefore this finding is closed.

Conclusion <i>Tick the appropriate checkbox</i>	☐ Additional action should be taken (finding remains open) ☒ The finding is closed
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CL ID	02	Section no.	D.2	Date:	23/02/2017
Description of CL					
Clarification is requested w.r.t. the calibration frequency stated in the MR for parameter NAP and measurement equipment micromotion mass flow meter. The MR states once in 3 years whereas the latest PDD does not specify any calibration frequency and the manufacturer does not require any recalibration.					
Project participant response (1st round)					Date:
The Emerson Coriolis mass flow meter does not require calibration as per manufacturer specifications. The monitoring report has been updated to reflect the actual situation.					
Documentation provided by project participant (1st round)					
☐	Changes in the PDD	Section(s):	New version No.:		
☒	Changes in MR	Section(s):	New version No.: 2		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☐	Other:				
DOE assessment (1st round)					Date:
Ok. Based on sectoral and technical knowledge of the assessment team the coriolis flow meter does not require any subsequent calibration. Further based on document check the meter does not require subsequent calibration. Therefore MR has been updated accordingly in line with related applicable monitoring plan.					
Conclusion <i>Tick the appropriate checkbox</i>		☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

Table 5. CAR from this verification

CAR ID	01	Section no.	B.2.2, B.2.5	Date:	23/02/2017
Description of CAR					
As per instruction to fill the MR in B.2.5 the related approval date and number for the latest PRC is missing. Further in section B.2.2 no reference to correction done in latest PRC is given.					
Project participant response (1st round)					
The Monitoring Report was updated to include the requested information.					
Documentation provided by project participant (1st round)					Date:
☐	Changes in the PDD	Section(s):	New version No.:		
☒	Changes in MR	Section(s): B.2.2, B.2.5	New version No.: 2		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☐	Other:				
DOE assessment (1st round)					Date:
Ok. The MR has been updated accordingly in line with related instructions to fill MR. The information provided has been crosschecked with the related UNFCCC project webpage and it can therefore be confirmed that info is consistent and correct.					
Conclusion <i>Tick the appropriate checkbox</i>		☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	02	Section no.	C	Date: 23/02/2017
Description of CAR				
Following documents are pending: - Attendance register for the QAL3 training by ABB - Information and supporting (if any) for further trainings conducted - Cal certs for - FT76550 Anubar, PT-76506 and TE-76170 - NO certificate gas for analyzer - QAL3 tests from Jan to March 2016				
Project participant response (1st round)				
<i>The attendance sheet issued by ABB has been submitted to the DOE.</i> <i>No further trainings have been conducted.</i> <i>Calibration certificates</i> <i>Provided for FT76550, PT-76506, TE-76170</i> <i>The gas bottle for the analyzer is the same gas bottle as during the last verification onsite visit. The related calibration certificate cannot be made available any more. The AST report from March 2016 has been submitted to the DOE.</i> <i>QAL3 tests</i> <i>The QAL3 tests were not conducted between the beginning of the campaign and 15/03/2016. The analyzer pump was defect until 22/03/2016 and therefore no readings were recorded. Please note that replacement values were used for the calculation in accordance with the methodology. The analyzer was calibrated by an external institute on 01/03/2016 (AST). The next internal calibration was conducted on 15/03/2016, which is in line with the bi-weekly requirements. As a result, the internal calibrations were delayed between 22/03/2016 and 01/03/2016. Due to the delayed AST, the maximum permissible error has already been applied to the monitoring data for that period.</i>				
Documentation provided by project participant (1st round)				Date:
☐	Changes in the PDD	Section(s):	New version No.:	
☒	Changes in MR	Section(s): C	New version No.:	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
DOE assessment (1st round)				Date:
- Ok. Related attendance sheet is provided. - Ok. As confirmed no further related trainings have been conducted. - Cal certificates: Ok. Certificates for FT-76550, PT-76506, TE-76170 has been provided. Accordingly the meters have been calibrated on 27/05/2015, 11/11/2015, 19/08/2016 Ok. The certificate of the gas bottle is still available to DOE from previous verification. The certificate indicates preparation date of 24/08/2015 and a stability of the gas of 12 months therefore ending 23/08/2016. The end date of the stability is therefore after the end date of this monitoring period. However FAR is raised as the onsite visit was conducted on 23/02/2017 which is after the end date of the stability given on the gas bottle. - Not ok. As per updated MR section B.1 the analyser pump failed for the period starting 06/01/2016 until 22/02/2016. Further ER calculation states AST delay for the period 05/01/2016 23:00 until 29/02/2016 23:00. This is inconsistent to the response stated. Pls clarify.				
Project participant response (2nd round)				
To point 4: the inconsistency is due to a typo in the first response. The QAL3 tests were not conducted between the beginning of the campaign and 15/03/2016. - The analyzer pump was defect until 22/02/2016 and therefore no readings were recorded. Please note that replacement values were used for the calculation in accordance with the methodology. - The analyzer was calibrated by an external institute on 01/03/2016 (AST). The next internal calibration was conducted 14 days later on 15/03/2016, which is in line with the bi-weekly requirements. As a result, the internal calibrations were delayed between 22/02/2016 and 29/02/2016. Due to the				

delayed AST, the maximum permissible error has already been applied to the monitoring data for that period. No additional correction was necessary.

Documentation provided by project participant (2nd round)			Date: 17/03/2017
☐	Changes in the PDD	Section(s):	New version No.:
☐	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		
DOE assessment (2nd round)			Date: 17/03/2017
Ok. Clarified. The documentation in line with the response provided now.			
Conclusion <i>Tick the appropriate checkbox</i>		☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	03	Section no.	B.1	Date: 23/02/2017
Description of CAR				
It has been identified that the down time for 19/03/2016 is not starting on 11:00 but 12:00. Besides specification is requested w.r.t. description for date 06/01/2016.				
Project participant response (1st round)				
The Monitoring Report was updated revise information.				
Documentation provided by project participant (1st round)				Date: 01/03/2017
☐	Changes in the PDD	Section(s):	New version No.:	
☒	Changes in MR	Section(s): B.2.2, B.2.5	New version No.: 2	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
DOE assessment (1st round)				Date: 16/03/2017
Ok. The MR has been updated accordingly. The information provided has been crosschecked with raw data and processed data in the ER spreadsheet and supporting during site visit and it can therefore be confirmed that info is consistent and correct.				
Therefore this finding is closed.				
Conclusion <i>Tick the appropriate checkbox</i>		☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Table 6. FAR from this verification

FAR ID	01	Section No.		Date: 16/03/2017
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
Documentation provided by project participant				
☐	Changes in the PDD	Section(s):	New version No.:	
☐	Changes in MR	Section(s):	New version No.:	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
DOE assessment				Date: DD/MM/YYYY
Conclusion <i>Tick the appropriate checkbox</i>				
☒ To be checked during the next periodic verification				

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	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, §§ 389-393) <i>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)).</i> <i>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.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /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. 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 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.	CAR 02 FAR 01	FAR 01

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		However CAR 02 and FAR 01 have been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/ /CAL/ /CoC/ /NATGAS/	Description: 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 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 latest QAL2 report the overall measurement accuracy is 1.60%. Verifier's action: 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: 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.	CAR 02 FAR 01	FAR 01

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Besides delay in calibration, delay of conducting AST, has been identified for the periods 06/01/2016 23:00 – 29/02/2016 23:00. Related provisions as per VVS §395 have been applied by considering the maximum permissible error for the stated periods, meaning leading to higher project emissions. Delayed calibration showed that the equipment is operating within permissible limits. However CAR 02 and FAR 01 have been raised.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: For PC17: 473.16 mg/Nm. Verifier's action: By means of checking ER spreadsheet against monthly data as well as hourly raw data. Conclusion: No mistake has been identified. However CAR 02 and FAR 01 have been raised..	CAR 02 FAR 01	FAR 01
B. VSG		Normal gas volume flow rate of the stack gas during each project campaign		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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.</i>	/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. The flow meter 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	CAR 02	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		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. However CAR 02 has been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/ /CAL/ /CoC/ /NATGAS/	Description: 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 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. As per latest QAL2 report the overall measurement accuracy is 2.082%. Verifier's action: 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	CAR 02	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		analyzed. Conclusion: 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. Besides delay in calibration, delay of conducting AST, has been identified for the periods 06/01/2016 23:00 – 29/02/2016 23:00. Related provisions as per VVS §395 have been applied by considering the maximum permissible error for the stated periods, meaning leading to higher project emissions. Delayed calibration showed that the equipment is operating within permissible limits. However CAR 02 has been raised.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: For PC17: 78,946 Nm³/h. Verifier's action: By means of checking ER spreadsheet against monthly data as well as hourly raw data. Conclusion: No mistake has been identified however CAR 02 has been raised.	CAR 02	OK
C. PEn		Total mass N ₂ O emissions in each project campaign		
a) Measurement / Determination method (VVS, §§ 389-393)	/IM01/ /PDD/	Description:	CAR 02	FAR 01

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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)).</i> <i>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.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/ /LOG/	The total mass N2O emissions in each project campaign is not monitored directly but calculated via following equation: $PE_n = VSG \times NCSG \times 10^{-9} \times OH$ 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 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. However CAR 02 and FAR 01 have been raised.	FAR 01	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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 Annex 2.</i>	/MR/ /PDD/	Description: No specific QA/QC procedure is applicable as this parameter is calculated. Verifier's action: by means of checking MR and PDD. Conclusion: However CL 01 and CAR 02 as well as FAR 01 have been raised.	~~CL-01~~ CAR 02	FAR 01
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /LOG/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: For PC17: 191.530 tN2O. Verifier's action: By means of checking ER spreadsheet against production log and technical manager log. Conclusion: No mistake has been identified however CAR 02 and CL 01 and 02 as well as FAR 01 have been raised.	CAR 02 CL-01 CL-02	FAR 01
D. OHn		Total operating hours during each project campaign		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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</i>	/IM01/ /PDD/ /AM34/ /MR/ /PDD/ /LOG/ /RAW/ /XLS/	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 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	ok	ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>is in line with the registered monitoring plan of the PDD and the applied methodology.</i>		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.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/MR/ /PDD/	Description: 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 logged continuously in the plant's DCS, there is a high accuracy. Verifier's action: 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 Conclusion: The value given in the monitoring report and used in ER calculation is correct.	Ok	Ok
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the</i>	/MR/ /PDD/ /LOG/ /XLS/	☒ Correct ☐ Not correct (initial assessment) Description: For PC17: 5,139 h. Verifier's action: By means of checking ER spreadsheet against production log and technical manager log.	Ok	ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/RAW/	Conclusion: No mistake has been identified.		
E. NAP		Metric tonnes of 100% concentrated nitric acid during each project campaign		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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.</i>	/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 414940 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. 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. 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. However CL 02 has been raised.	CL-02	Ok
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether</i>	/CAL/ /MR/	Description: 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	CL-02	ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/PDD/ /XLS/	the measurements have been identified. Neither were inaccuracies beyond the permitted range identified during the calibration process. External calibrations have been carried out on 09/03/2011 and 19/05/2014. The validity of the calibrations is three years. The accuracy of the coriolis mass flow meter is $\leq 0.1\%$. Verifier's action: 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 adjustment of the instrumentation and plant operation. Conclusion: 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. However CL 02 has been raised.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /LOG/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: For PC17: 148,526 tHNO₃. Verifier's action: By means of checking ER spreadsheet against production log and technical manager log. Conclusion: No mistake has been identified.	Ok	ok
F. TSG		Temperature in the stack gas		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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)).</i> <i>Check if relevant equipment has been exchanged and if in</i>	/IM01/ /PDD/ /AM34/ /MR/ /AST/	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	CAR 02	ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/QAL1/ /QAL2/ /RAW/	standard EN 14181. 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. Conclusion: The monitoring procedure is as per reg PDD. However CAR 02 has been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i>	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/	Description: 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 thermocouple 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 by Müller-BBM GmbH. The AST according to EN 14181 was performed on	CAR 02	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/QAL2/ /RAW/ /CAL/ /CoC/ /NATGAS/	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 latest QAL2 report the overall measurement accuracy is 2.55% Verifier's action: 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. Furthermore the calibration procedures under QAL 3 and certificates of used span and zero gases have been analyzed. Conclusion: 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. Besides delay in calibration, delay of conducting AST, has been identified for the periods 06/01/2016 23:00 – 29/02/2016 23:00. Related provisions as per VVS §395 have been applied by considering the maximum permissible error for the stated periods, meaning leading to higher project emissions. Delayed calibration showed that the equipment is operating within permissible limits.		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Nevertheless CAR 02 has been raised.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/ MR/ / PDD/ / LOG/ / XLS/ / RAW/	☒ Correct ☐ Not correct (initial assessment) Conclusion: The applied measurement method is appropriate and the values used are deemed correct. Nevertheless CAR 02 has been raised. Verifier's action: By means of checking ER spreadsheet against production log and technical manager log however CAR 02 has been raised.	CAR 02	Ok
G. PSG		Pressure in the stack		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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.</i>	/ IM01/ / PDD/ / AM34/ / MR/ / AST/ / QAL1/ / QAL2/ / RAW/	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. 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	CAR 02	ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		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. However CAR 02 has been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/IM01/ /PDD/ /AM34/ /MR/ /AST/ /QAL1/ /QAL2/ /RAW/ /CAL/ /CoC/ /NATGAS/	Description: 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 pressure measurement device 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 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 latest QAL2 report the overall measurement accuracy is 0.70% Verifier's action: The measured pressure 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: Numerous QA/QC checks are implemented and foreseen, such	CAR 02	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		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. Besides delay in calibration, delay of conducting AST, has been identified for the periods 06/01/2016 23:00 – 29/02/2016 23:00. Related provisions as per VVS §395 have been applied by considering the maximum permissible error for the stated periods, meaning leading to higher project emissions. Delayed calibration showed that the equipment is operating within permissible limits. Nevertheless CAR 02 has been raised.		
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/MR/ /PDD/ /LOG/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Conclusion: The applied measurement method is appropriate and the values used are deemed correct. Verifier's action: By means of checking ER spreadsheet against production log and technical manager log however CAR 02 has been raised.	CAR 02	Ok
H. EFn		Emission factor for campaign n		
a) Measurement / Determination method (VVS, §§ 389-393) 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)).	/IM01/ /PDD/ /AM34/ /MR/	Description: The emission factor for campaign n is calculated from parameter PEn an NAP as following: $EF_n = PEn / NAP_n$ For the measurement method of the parameters PEn and NAP	Ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/XLS/ /LOG/	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 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.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/MR/ /PDD/ /IM01/	Description: Not applicable as the value is calculated. Verifier's action: Based on onsite observation and document check. Conclusion: The value given in the monitoring report and used in ER calculation is correct.	Ok	Ok
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the</i>	/MR/ /PDD/ /LOG/	☒ Correct ☐ Not correct (initial assessment) Description:	Ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)				Draft Concl.	Final Concl.
monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/XLS/ /RAW/						
		Campaign	Initial	final	Unit		
		For PC17:	0.001290	0.001290	tN2O/tHNO3		
		Verifier´s action: By means of checking ER spreadsheet against production log and technical manager log. Conclusion: No mistake has been identified.					
I. EFma,n		Moving average emissions factor derived over time from campaign specific emissions factors					
a) Measurement / Determination method (VVS, §§ 389-393) 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 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. 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.				Ok	Ok
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) 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	/MR/ /PDD/ /IM01/	Description: Not applicable as the value is calculated. Verifier´s action: Based on onsite observation and document check. Conclusion: The value given in the monitoring report and used in ER calculation is correct.				Ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.								
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 Annex 2.												
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/MR/ /PDD/ /LOG/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description:<table><tr><th>Campaign</th><th>Initial</th><th>final</th><th>Unit</th></tr><tr><td>For PC17:</td><td>0.000985</td><td>0.000985</td><td>tN2O/tHNO3</td></tr></table> Verifier´s action: By means of checking ER spreadsheet against production log and technical manager log. Conclusion: No mistake has been identified.	Campaign	Initial	final	Unit	For PC17:	0.000985	0.000985	tN2O/tHNO3	OK	Ok
Campaign	Initial	final	Unit									
For PC17:	0.000985	0.000985	tN2O/tHNO3									
J. EFp		Emissions factor used for the specific campaign n to determine the emission reductions of that campaign										
a) Measurement / Determination method (VVS, §§ 389-393) 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 emission factor for the specific campaign n to determine the emission reduction of that campaign is derived as following: If EF_{ma,n} > EF_n then EF_p = EF_{ma,n} If EF_{ma,n} < EF_n then EF_p = EF_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. 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.	Ok	Ok								

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.								
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/MR/ /PDD/ /IM01/	Description: Not applicable as the value is calculated. Verifier's action: Based on onsite observation and document check. Conclusion: The value given in the monitoring report and used in ER calculation is correct.	Ok	Ok								
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /LOG/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: <table border="1" data-bbox="1041 842 1809 938"> <thead> <tr> <th>Campaign</th><th>Initial</th><th>final</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>For PC17:</td><td>0.001290</td><td>0.001290</td><td>tN2O/tHNO3</td></tr> </tbody> </table> Verifier's action: By means of checking ER spreadsheet against production log and technical manager log. Conclusion: No mistake has been identified.	Campaign	Initial	final	Unit	For PC17:	0.001290	0.001290	tN2O/tHNO3	Ok	Ok
Campaign	Initial	final	Unit									
For PC17:	0.001290	0.001290	tN2O/tHNO3									
K. EFmin		EFmin is equal to the lowest EF _n observed during the first 10 campaigns of the project crediting period.										
a) Measurement / Determination method (VVS, §§ 389-393) <i>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)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.</i>	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/ /VER/	Description: The minimum emission factor for the first campaigns is determined as following: If EF _{min} = Min(EF ₁ to EF ₁₀) 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	ok	Ok								

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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.		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 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.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) 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 Annex 2.	/MR/ /PDD/ /IM01/	Description: Not applicable as the value is calculated. Verifier's action: Based on onsite observation and document check. Conclusion: The value given in the monitoring report and used in ER calculation is correct.	Ok	Ok
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/MR/ /PDD/ /LOG/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: The value is 0.000417 tN₂O/tHNO₃. Verifier's action: By means of checking ER spreadsheet against production log and technical manager log. Conclusion: No mistake has been identified.	Ok	Ok
L. EFreg		Emissions cap for N ₂ O from nitric acid production set by government regulation		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
a) Measurement / Determination method (VVS, §§ 389-393) 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. 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.	Ok	Ok
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) 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 Annex 2.		Not applicable	n.a.	n.a
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the		☐ Correct ☐ Not correct (initial assessment) conclusion: not applicable	n.a.	n.a

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>				
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, §§ 389-393) 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
b) Accuracy and QA/QC Procedure		Description:	n.a.	n.a

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
(VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/MR/ /PDD/ /IM01/	Not applicable as no measurement equipment is involved.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /LOG/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: The value is for PC17: 148,526 tHNO ₃ Verifier's action: By means of checking ER spreadsheet against production log and technical manager log. Conclusion: No mistake has been identified.	Ok	Ok
N. OPh		Oxidation pressure for each hour		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.</i> <i>Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PDD/ /AM34/ /MR/ /XLS/ /LOG/	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. 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	~~CL-01~~	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		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 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. Besides CL 01 has been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/MR/ /ISO/	Description: 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 dismantled when the plant is not in operation. For details see Appendix 6. Verifier's action: By means of checking calibration certificates, interview with PP as well as MR and reg PDD. Conclusion: 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. Besides CL 01 has been raised.	~~CL-01~~	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i>	/MR/ /XLS/ /LOG/	☒ Correct ☐ Not correct (initial assessment) Description: The value is used to determine whether the plant is operating	~~CL-01~~	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/PDD/	within the normal operation range. OPh is therefore compared with OPnormal. VSG and NCSG data has to be eliminated during times when OPh is outside the OPnormal range for calculation of EFp. Verifier's action: By means of checking MR, reg PDD as well as ER calculation spreadsheet, technical manager log and hourly raw data by AMS and PCS. Conclusion: No mistake or inconsistency has been identified. EFp has been determined correctly based on OPh data. However CL 01 has been raised.		
O. OTh		Oxidation temperature in the ammonia oxidation reactor (AOR) for each hour		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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)).</i> <i>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.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/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. 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 MR, reg PDD as well as Er spreadsheet and technical manager log and interview with PP.	~~CL-01~~	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Conclusion: The measurement procedure and data aggregation is as per reg PDD. Besides CL 01 has been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/MR/ /ISO/	Description: The thermocouples have an accuracy of +/-0.4%. The calibration is valid until the restart of the next campaign. This is due to practical means as the thermocouples can only be dismantled when the plant is not in operation. Therefore delay in calibration has been identified as per Appendix 6 of this report. Verifier's action: By means of checking calibration certificates, interview with PP as well as MR and reg PDD. Conclusion: QA/QC procedures were established and requirements are fulfilled. Delay in calibration has been identified as per Appendix 6. The delayed calibration showed that the equipment is operating within the permissible limits. The parameter has an influence on the emission reduction calculation as it is used to determine if the plant is online or offline. In line with §395 of VVS the maximum permissible error of the instruments for OT_h was applied in a conservative manner. Usually, the plant is considered online at temperatures above 820°C. The maximum permissible error is 0.4%, which has been deducted, resulting in a lower limit 816.72°C, under which the plant is considered offline. While this has an increasing effect on the operating hours, the resulting emission reductions are lower than before the correction. However CL01 has been raised.	~~CL-01~~	Ok
c) Correctness (VVS, §§ 389-393)	/MR/ /XLS/	☒ Correct ☐ Not correct (initial assessment) Description:	~~CL-01~~	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/LOG/ /PDD/	The value is used to determine whether the plant is operating outside permitted range. Further OTh is a control parameter for AIFR. Verifier's action: By means of checking MR, reg PDD as well as ER calculation spreadsheet, technical manager log and hourly raw data by AMS and PCS. Conclusion: No mistake or inconsistency has been identified. However CL 01 has been raised.		
P. AFR		Ammonia gas flow rate to the ammonia oxidation reactor		
a) Measurement / Determination method (VVS, §§ 389-393) <i>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.</i>	/IM01/ /PDD/ /AM34/ /QAL2/	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. 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 MR, reg PDD as well as ER spreadsheet and technical manager log and interview with PP. Conclusion:	~~CL-01~~	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The measurement procedure and data aggregation is as per reg PDD. However CL 01 has been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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 Annex 2.</i>	/ MR / / PDD / / CAL /	Description: 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 dismantled when the plant is not in operation. Verifier's action: By means of checking calibration certificates, interview with PP as well as MR and reg PDD. Conclusion: QA/QC procedures were established and requirements are fulfilled. Delayed calibration has been identified as per Appendix 6. The delayed calibration showed that the equipment is operating within the permissible limits. The parameter has no influence on the ER calculation and therefore no adjustment has been conducted. However CL 01 has been raised.	~~CL-01~~	Ok
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/ MR / / XLS / / LOG / / PDD /	☒ Correct ☐ Not correct (initial assessment) Description: The value is used to determine whether the plant is operating outside permitted range. AFR is compared to AFRmax. Verifier's action: By means of checking MR, reg PDD as well as ER calculation spreadsheet, technical manager log and hourly raw data by AMS and PCS. Conclusion: No mistake or inconsistency has been identified. However CL 01 has been raised.	~~CL-01~~	Ok
Q. AIFR		Ammonia to air ratio into the ammonia oxidation reactor		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
a) Measurement / Determination method (VVS, §§ 389-393) 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/ /QAL2/	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. 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 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.	Ok	Ok
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) 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	/MR/ /PDD/ /CAL/	Description: 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 dismantled when the plant is not in operation.	Ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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 Annex 2.		Verifier's action: By means of checking calibration certificates, interview with PP as well as MR and reg PDD. Conclusion: QA/QC procedures were established and requirements are fulfilled. Delay in calibration has been identified as per Appendix 6. The delayed calibration showed that the meter is operating within the permissible limits. The parameter has no influence on the ER calculation and therefore no adjustment has been conducted.		
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/MR/ /XLS/ /LOG/ /PDD/	☒ Correct ☐ Not correct (initial assessment) Description: The value is used to determine whether the plant is operating outside permitted range. AFR is compared to AFRmax. Verifier's action: By means of checking MR, reg PDD as well as ER calculation spreadsheet, technical manager log and hourly raw data by AMS and PCS. Conclusion: No mistake or inconsistency has been identified.	ok	ok
R. GSproject		Gauze supplier for the project campaign		
a) Measurement / Determination method (VVS, §§ 389-393) 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	/IM01/ /PDD/ /INV/	Description: Is monitored via invoices received from the supplier of the gauze, for this monitoring period W.C. Heraeus. Verifier's action: By means of checking PDD as well as related invoice from gauze supplier as well as site observation and interview with	ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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.		personnel. Conclusion: Ok		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>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.</i> <i>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.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/PDD/ /MR/	Description: No measurement and crosscheck required. Verifier's action: By means of checking PDD, MR and by onsite observation. Conclusion: Ok.	ok	ok
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/	☒ Correct ☐ Not correct (initial assessment) Description: W.C. Heraeus is the Gauze supplier for the project campaign, which is Taken from invoice of supplier. Verifier's action: By means of checking MR against supplier invoice. Conclusion: The gauze supplier is correct.	ok	ok
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.		
a) Measurement / Determination method (VVS, §§ 389-393)	/IM01/ /PDD/	Description: The gauze composition for this monitoring period is given with	ok	ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
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/ /QAL2/	PC17: 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.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) 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 Annex 2.	/INV/	Description: Not applicable as this parameter is not monitored by measurement equipment. Verifier's action: Conclusion:	N/A	N/A
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/MR/ /INV/	☒ Correct ☐ Not correct (initial assessment) Description: Taken from invoice of supplier. Verifier's action: By means of checking MR against supplier invoice. Conclusion: the gauze compistion is stated as per related invoice of the supplier.	ok	ok

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	1.66% as per latest QAL2	22/06/2011 ² 03/07/2012 06/08/2013 23/09/2014 ²	01/03/2016	QAL2 every 5 years AST every year	☐ No ☒ Yes	From: 06/01/2016 To: 29/02/2016
gas flow meter	VSG	FT-76550	Emerson Rosemount Anubar	1367.71m ³ /h	28/11/2012 ³ 07/06/2013 02/04/2014 24/10/2014 27/05/2015 11/11/2015 19/08/2016		1 year	☒ No ☐ Yes	From: To:
				2.082% as per latest QAL2	22/06/2011 ² 03/07/2012 06/08/2013 23/09/2014 ²	01/03/2016	QAL2 every 5 years AST every year	☐ No ☒ Yes	From: 06/01/2016 To: 29/02/2016
stack pressure probe	PSG	PT-76506		10mbar	28/11/2012 ³ 07/06/2013 02/04/2014 24/10/2014 27/05/2015		1 year	☒ No ☐ Yes	From: To:

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

³ Based on calibration certificates

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
					11/11/2015 19/08/2016				
				0.7% as per latest QAL2	22/06/2011 ² 03/07/2012 06/08/2013 23/09/2014 ²	01/03/2016	QAL2 every 5 years AST every year	☐ No ☒ Yes	From: 06/01/2016 To: 29/02/2016
stack temperature probe	TSG	TE-76170	Emerson Rosemount Anubar	5°C	28/11/2012 ³ 07/06/2013 02/04/2014 24/10/2014 27/05/2015 11/11/2015 19/08/2016		1 year	☒ No ☐ Yes	From: To:
				2.55% as per latest QAL2	22/06/2011 ² 03/07/2012 06/08/2013 23/09/2014 ²	01/03/2016	QAL2 every 5 years AST every year	☐ No ☒ Yes	From: 06/01/2016 To: 29/02/2016
Nitric acid flow meter	NAP	11007573	Emerson coriolis flow meter CMF300	<=0.1%	19/05/2014	-	No subsequent calibration required as per manufacturer	☒ No ☐ Yes	From: To:
pressure probe	OP _h	PT-76002-1 F576FB671708	Yokogawa Oress Tx	1.7%	07/06/2013 02/04/2014 04/12/2014 25/05/2015 11/11/2015 19/08/2016		For one campaign	☐ No ☒ Yes	From: 07/01/2016 To: 17/08/2016

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
thermocouples	OT _h	TC76159-1 to -5	K310 S/steel Thermocouple	±0.4%	07/06/2013 02/04/2014 23/10/2014 29/05/2015 11/11/2015 19/08/2016		For one campaign	☐ No ☒ Yes	From: 07/01/2016 To: 17/08/2016
pressure measurement	AFR	FT-76003-1 F570FD073708	Yokogawa Orifice plate with D.P. transmitter	1.25%	07/06/2013 02/04/2014 04/12/2014 25/05/2015 11/11/2015 19/08/2016		For one campaign	☐ No ☒ Yes	From: 07/01/2016 To: 17/08/2016
flow meter	AIFR	FT-76002-1 JA08710109D	E+H	1.25%	28/12/2014 25/05/2015 11/11/2015		For one campaign	☐ No ☒ Yes	From: 07/01/2016 To: 17/08/2016