Monitoring report form

(Version 05.1)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT		
Title of the project activity	Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.	
UNFCCC reference number of the project activity	0490	
Version number of the monitoring report	Version 1	
Completion date of the monitoring report	31/03/2017	
Monitoring period number and duration of this monitoring period	Monitoring period number: 30 (monitoring period 3 of 2nd crediting period) Duration: 19/04/2015 – 10/01/2017	
Project participant(s)	CARBON Egypt Ltd. KOMMUNALKREDIT PUBLIC CONSULTING GmbH (withdrawn as of 04/11/2016) Energie AG Oberösterreich (withdrawn as of 04/11/2016) RWE Power AG CARBON Climate Protection GmbH	
Host Party	Arab Republic of Egypt	
Sectoral scope(s)	5 – Chemical industries	
Selected methodology(ies)	ACM0019 Version 02.0 ("N_2O abatement from nitric acid production")	
Selected standardized baseline(s)	NA	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	2,214,379 tCO_2e (633 days)	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	NA	2,026,184 tCO_2e (633 days)

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>>

(a) Carbon Egypt has implemented a project for GHG emission reduction by catalytic N_2O destruction in Abu Qir, Egypt. The project is categorized as large scale project under sectoral scope 5: “Chemical Industry”. The Host Party for the project activity is the Republic of Egypt. The Project Activity includes development, design, engineering, procurement, finance, construction, operation and maintenance of a system for catalytic reduction of N_2O. The EnviNOx® process used in the Abu Qir II nitric acid plant is based on the catalytic reduction of NO_x (NO and NO_2) with ammonia (NH_3) and of nitrous oxide (N_2O) with a hydrocarbon. The hydrocarbon used is natural gas of which the main constituent is methane (CH_4). The reactions take place over two iron zeolite catalyst beds.

(b) In this project, CARBON Egypt installed the EnviNOx® system for catalytic reduction of NO_x and N_2O additionally to the equipment at the nitric acid manufacturing plant. The project activity reduces the GHG emissions, which would otherwise be released to the atmosphere, if the project was not implemented. The implementation of the N_2O destruction project at Abu Qir Fertilizer Co. S.A.E. (furthermore called “AFC”) involves that natural gas, a mixture of hydrocarbons of which the main constituent is methane (CH_4), is employed as a reducing agent for N_2O removal.

(c) The EnviNOx® system was installed in September 2006 and the catalytic reduction process of N_2O started its operation in October 2006. The N_2O destruction unit is in continuous operation since its start-up and has only stopped for short periods due to planned and corrective maintenance works.

(d) Throughout the 1st crediting period of the CDM Project Activity had been monitored continuously according to the approved CDM methodology AM0028 v01. A Request for Renewal of Crediting Period and a new PDD under methodology ACM0019 v02.0 were submitted by the Project Participants and the crediting period was renewed on January 31st, 2014.

(e) Total emission reductions achieved in this monitoring period: **2,026,184 tCO_2e**

A.2. Location of project activity

>>

(a) Host Party(ies): Arab Republic of Egypt
(b) Province: Al-Iskandariyah Province (Alexandria Province)
(c) Town: Abu Qir
(d) GPS coordinates: N31.272513° E30.09755°

AFC, the largest fertilizer company in Egypt, is located about 15 km east of downtown Alexandria, in a rural area, approximately 5 km outside the small town of Abu Qir. Abu Qir is situated north-east of Alexandria, bordering the suburbs of Alexandria. AFC is located on the shores of the Mediterranean Sea. The company has road and rail access as well as a nearby ship loading terminal.

Figure 1: Satellite image of Alexandria

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
Arab Republic of Egypt (Host)	CARBON Egypt Ltd.	No
Republic of Austria	KOMMUNALKREDIT PUBLIC CONSULTING GmbH (withdrawn as of 04/11/2016); Energie AG Oberösterreich (withdrawn as of 04/11/2016); CARBON Climate Protection GmbH	No
Federal Republic Germany	RWE Power AG	No

Project applicant, developer and sponsor is **CARBON Egypt Ltd.** (CARBON Egypt), which is registered under the laws of the Arab Republic of Egypt. The company is a subsidiary of CARBON Projektentwicklung GmbH, Austria, and RWE Power AG, Germany.

CARBON Projektentwicklung GmbH was founded as a limited liability company located and registered in Austria under Austrian law in order to develop, finance and operate high quality JI/CDM Projects. CARBON Projektentwicklung GmbH has vast experience with CDM-Project development in Africa, Latin America and Asia and is specialized on the catalytic N_2O destruction in the tail gas of nitric acid plants.

Carbon Climate Protection GmbH (CARBON Austria) is a limited liability company located and registered in Austria under Austrian law. CARBON Austria is responsible for the project development. The company is an experienced financing and investment company, focussing on the development and implementation of Greenhouse Gas reduction projects according to Article 6 of the Kyoto Protocol (Joint Implementation) and Article 12 of the Kyoto Protocol (Clean Development Mechanism).

The RWE Group is one of Europe's leading integrated electricity and gas companies. **RWE Power AG** is the continental power generation company within the RWE Group and Germany's biggest power producer. RWE Power has a diverse generation portfolio including lignite, hard coal, nuclear energy, gas and renewable sources such as hydro, wind and biomass. RWE invests and participates actively in projects under the Clean Development Mechanism and Joint

Implementation. The RWE team combines a track record in global commodities and emissions trading as well as risk management with broad experience and a deep understanding of specific risks inherent in CDM and JI projects.

Host Country is the Arab Republic of Egypt. The Arab Republic of Egypt ratified the Kyoto Protocol in January 2005. The other Party involved in the Project at the time of registration is the Republic of Austria. Subsequent to the registration of the Project, Federal Republic Germany has been added as a Party involved in the Project.

Focal point:
The project participants agreed that CARBON Projektentwicklung GmbH, Austria serves as focal point of communication with the Executive Board and the UNFCCC Secretariat.

A.4. Reference of applied methodology and standardized baseline

>>

(a) ACM0019: “Large-scale consolidated methodology: N_2O abatement from nitric acid production” (Version 02.0)[1]
(b) Methodological tool: Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (Version 02)[2]
(c) Methodological tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 03.0.0)[3]
(d) According to the applied methodology no standardized baselines are used.

A.5. Crediting period of project activity

>>

Type of the crediting period:	Renewable (3 x 7 years)
Starting date of the 2nd crediting period:	15/09/2013
End date of the 2nd crediting period:	14/09/2020

A.6. Contact information of responsible persons/entities

>>

CARBON Climate Protection GmbH
Mrs. Sonja Bichler
Am Suedblick 5/2, A-3550 Langenlois

Tel: +43 2734 32270-70
Mobile: +43 676 6259415
E-mail: bichler@carbon-austria.com

CARBON Climate Protection GmbH is a project participant. For further information please see Appendix 1.

1 http://cdm.unfccc.int/methodologies/DB/Y0S50SAZFK4FJOMZH2T7EN1I3HI8T0
2 http://cdm.unfccc.int/methodologies/PAmethodologies/tools/
3 http://cdm.unfccc.int/methodologies/PAmethodologies/tools/

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>>

(a) Information on the implementation status of the project activity

The EnviNOx® system was installed in September 2006 and the catalytic reduction process of N_2O started its operation in October 2006 (first crediting period of CDM project activity). The project has been implemented and is operated as per the registered PDD with all physical features (technology, project equipment, and monitoring and metering equipment) in place. Monitoring is done according to the applied methodology (ACM0019 v02.0) and the registered monitoring plan.

(b) Description of the installed technology, technical processes and equipment

General Introduction:

Nitrous oxide (N_2O) is an unwanted, invisible and previously neglected by-product of the manufacture of nitric acid. It is formed alongside the main, desired product nitric oxide (NO) during the catalytic oxidation of ammonia in air over noble metal gauzes. The production of nitric acid takes place in three main process steps as indicated by the following reactions:

1. Ammonia (NH_3) combustion to form nitric oxide (NO)[4]:

   $4\ NH_3 + 5\ O_2 \rightarrow 4\ NO + 6\ H_2O$ (main reaction 1)

   Simultaneously nitrous oxide (N_2O), nitrogen (N) and water (H_2O) are formed as well, in accordance with the following equations:

   $4\ NH_3 + 3\ O_2 \rightarrow 2\ N_2 + 6\ H_2O$ (side reaction 1)
   $4\ NH_3 + 4\ O_2 \rightarrow 2\ N_2O + 6\ H_2O$ (side reaction 2)

   NO yield mainly depends on pressure and temperature in the ammonia oxidation process and is usually in a range of 95% to 97%.

2. NO is oxidised to nitrogen dioxide (NO_2):

   $2\ NO + O_2 \rightarrow 2\ NO_2$ (main reaction 2)

3. (According to the technical process) Absorption of NO_2 in water to form nitric acid (HNO_3):

   $3\ NO_2 + H_2O \rightarrow 2\ HNO_3 + NO$ (main reaction 3)
   (NO is oxidised to NO_2 according to main reaction 2)

<u>Description of catalytic reduction process:</u>
Although the term catalytic reduction nowadays has a more general definition in terms of the transfer of electrons, the following definition is sufficient for present purposes: catalytic reduction of N_2O occurs when reactions take place between N_2O and other substances in contact with a catalyst, such that the oxygen is removed from the N_2O molecule and forms one or more compounds with other species. The substance or substances that react with N_2O to remove oxygen are termed reducing agent. A general reaction equation for the catalytic reduction of N_2O can be given as:

[4] Ammonia is reacted with air on noble metal catalyst in the oxidation section of nitric acid plants. Nitric oxide and water are formed in this process according to the above mentioned main equation.

$$n\,N_2O + x\,RA \rightarrow n\,N_2 + y_1\,P(1)O_A + y_2\,P(2)O_B + \ldots + z_1\,Q(1) + z_2\,Q(2) + \ldots$$

where RA is a molecule of the reducing agent, $P(1)O_A$, $P(2)O_B$ are the compound formed by reaction with the oxygen of the N_2O and Q(1), Q(2) represent further products of the oxidation reaction, n, x, y_1, y_2, z_1, z_2 are the appropriate stoichiometric coefficients.

Project Specific description:

Principles of the EnviNO$_X$® process:

The reactions take place over two iron zeolite catalyst beds. The first bed contains an iron zeolite that is especially effective in catalysing the reduction of NO_x with ammonia according to such reactions as:

$$6\,NO_2 + 8\,NH_3 \rightarrow 7\,N_2 + 12\,H_2O$$
$$6\,NO + 4\,NH_3 \rightarrow 5\,N_2 + 6\,H_2O$$
$$NO + NO_2 + 2\,NH_3 \rightarrow 2\,N_2 + 3\,H_2O$$
$$4\,NO + O_2 + 4\,NH_3 \rightarrow 4\,N_2 + 6\,H_2O$$

Effectively all the NO_x is removed. Furthermore some destruction of N_2O occurs.

Equations showing reduction N_2O with methane:

The second and main bed contains an iron zeolite that is particularly efficient in catalysing the reduction of nitrous oxide with methane.

$$CH_4 + 3\,N_2O \rightarrow CO + 2\,H_2O + 3\,N_2$$
$$CH_4 + 4\,N_2O \rightarrow CO_2 + 2\,H_2O + 4\,N_2$$

Technology employed by the project activity:

In this project, CARBON Egypt installed the EnviNO$_X$® system for catalytic reduction of NO_x and N_2O additionally to the equipment at the nitric acid manufacturing plant. The project activity reduces the GHG emissions, which would otherwise be released to the atmosphere, if the project was not implemented. The implementation of the N_2O destruction project at AFC involves that natural gas, a mixture of hydrocarbons of which the main constituent is methane (CH_4), is employed as a reducing agent for N_2O removal. The EnviNO$_X$®-Reactor (21R004) is located between tail gas heater IV (21E013) and the tail gas turbine (21MT02) which is the position with the highest tail gas temperature in the nitric acid production process at AFC.

The following figure shows the spatial extend of the project boundary.

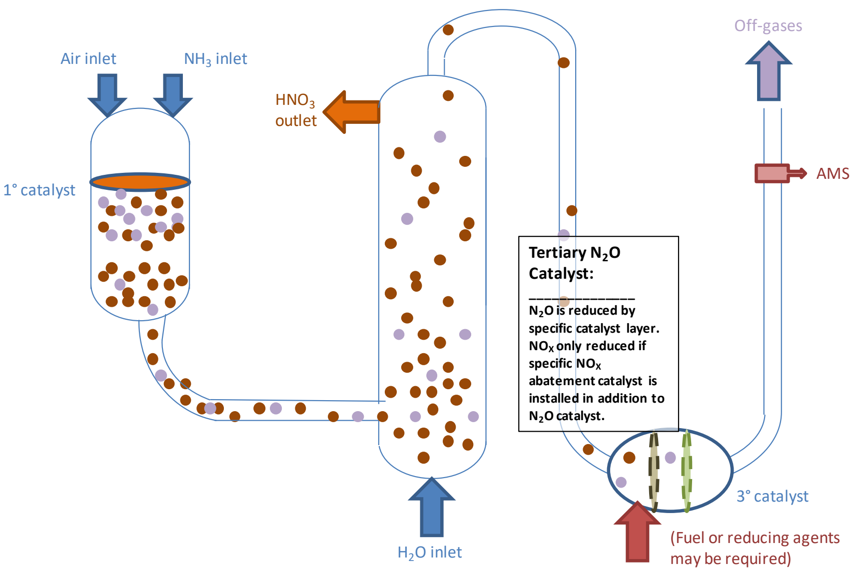

Figure 2: Project boundary Abu Qir II

At Abu Qir II nitric acid plant, the EnviNO$_X$®-Systems is installed between the tail gas heaters and the tail gas turbine. The DeNO$_x$-unit was removed.

(c) Information on the actual operation of the project activity

During the monitoring period under consideration several observations have been made. Those events have been analysed in detail as described hereunder.

Observations at Nitric Acid plant:

Start		End		Description
Date	Time	Date	Time	
29/06/2015	00:00	01/07/2015	02:00	Nitric Acid plant shutdown (Gauze Change)
21/07/2015	03:00	25/07/2015	04:00	Nitric Acid plant shutdown (Power Failure)
01/10/2015	14:00	22/10/2015	16:00	Nitric Acid plant shutdown (Annual Shutdown)
24/10/2015	17:00	09/11/2015	15:00	Nitric Acid plant shutdown (Power Failure)
17/12/2015	22:00	20/12/2015	02:00	Nitric Acid plant shutdown (High Vibration in the Steam Turbine)
29/03/2016	22:00	31/03/2016	17:00	Nitric Acid plant shutdown (Gauze Change)
04/04/2016	11:00	04/04/2016	17:00	Nitric Acid plant shutdown (Valve failure)
19/08/2016	16:00	20/08/2016	00:00	Nitric Acid plant shutdown (Valve failure)
15/11/2016	22:00	17/11/2016	11:00	Nitric Acid plant shutdown (Gauze Change)

Table 1: Shutdown periods of NA plant

Relevant hours of nitric acid plant (and consequently EnviNOx®) shutdown periods as well as hours in which the abatement system was deemed to be bypassed, not working, underperform or failed have not been considered in overall calculations of Emission Reductions. For the respective hours, no Emissions Reductions are claimed. This approach ensures the most conservative way to determine Emissions Reductions.

Observations at EnviNOx® system:

Start		End		Description
Date	Time	Date	Time	
07/05/2015	11:00	07/05/2015	13:00	Monthly check (FT-21492)
02/06/2015	12:00	02/06/2015	14:00	Analyser Periodic Inspection (AT-218002)
04/06/2015	12:00	04/06/2015	14:00	Monthly check (FT-21492)
06/06/2015	11:00	06/06/2015	21:00	HVAC Maintenance (Analyser House) – Influence on N_2O analyser (AT-218002)
09/06/2015	09:00	09/06/2015	18:00	AST Test outlet analyser – Influence on N_2O analyser (AT-218002)
17/06/2015	13:00	17/06/2015	14:00	Analyser sample lines verification (AT-218002)
25/07/2015	08:00	25/07/2015	12:00	Instable outlet N_2O measurements after NA plant start-up (AT-218002)
26/07/2015	11:00	26/07/2015	14:00	Cleaning outlet sample lines (AT-218002)
28/07/2015	11:00	28/07/2015	13:00	Monthly check (FT-21492)
20/08/2015	12:00	20/08/2015	14:00	Analyser Periodic Inspection (AT-218002)
27/08/2015	12:00	27/08/2015	14:00	Monthly check (FT-21492)
25/09/2015	12:00	25/09/2015	13:00	Monthly check (FT-21492)
10/11/2015	13:00	10/11/2015	14:00	Outlet NOx analyser maintenance – Influence on N_2O analyser (AT-218002)

17/11/2015	12:00	17/11/2015	14:00	Analyser Periodic Inspection (AT-218002)
19/11/2015	11:00	19/11/2015	13:00	Monthly check (FT-21492)
17/12/2015	11:00	17/12/2015	13:00	Monthly check (FT-21492)
14/01/2016	11:00	14/01/2016	13:00	Monthly check (FT-21492)
11/02/2016	11:00	11/02/2016	13:00	Monthly check (FT-21492)
17/02/2016	12:00	17/02/2016	15:00	Analyser Periodic Inspection (AT-218002)
22/02/2016	00:00	06/03/2016	23:00	DeNOx Strategy – N_2O out of range (AT-218002)
10/03/2016	11:00	10/03/2016	13:00	Monthly check (FT-21492)
11/03/2016	00:00	14/03/2016	11:00	Outlet sample lines blockage (AT-218002)
14/03/2016	11:00	14/03/2016	13:00	Cleaning outlet sample lines (AT-218002)
28/04/2016	10:00	28/04/2016	12:00	Monthly check (FT-21492)
14/05/2016	11:00	14/05/2016	13:00	Natural gas temperature transmitter out of range (TT-218004)
26/05/2016	11:00	26/05/2016	13:00	Monthly check (FT-21492)
30/05/2016	11:00	30/05/2016	12:00	Outlet analyser incorrect range (AT-218002)
01/06/2016	13:00	01/06/2016	15:00	Analyser Periodic Inspection (AT-218002)
02/06/2016	14:00	02/06/2016	15:00	Analyser Periodic Inspection (AT-218002)
09/06/2016	12:00	11/01/2017	00:00	Delay of calibration (AT-218002 & FT-21492)
23/06/2016	11:00	23/06/2016	13:00	Monthly check (FT-21492)
13/07/2016	05:00	19/08/2016	17:00	AOR Temperature element malfunction (TT-21021)
13/07/2016	11:00	13/07/2016	12:00	Outlet analyser incorrect range (AT-218002)
21/07/2016	11:00	21/07/2016	13:00	Monthly check (FT-21492)
18/08/2016	11:00	18/08/2016	13:00	Monthly check (FT-21492)
20/08/2016	00:00	21/08/2016	11:00	Outlet sample lines blockage (AT-218002)
21/08/2016	11:00	21/08/2016	14:00	Cleaning outlet sample lines (AT-218002)
01/09/2016	01:00	01/09/2016	09:00	Problem in the analyser power supply (AT-218002)
01/09/2016	01:00	06/09/2016	15:00	Problem in the DCS module (FT-218002)
07/09/2016	14:00	07/09/2016	17:00	Nitric Acid flow meter replacement (FT-21411)
15/09/2016	10:00	15/09/2016	12:00	Monthly check (FT-21492)
28/09/2016	11:00	28/09/2016	14:00	Analyser Periodic Inspection (AT-218002)
24/10/2016	18:00	25/10/2016	09:00	Outlet sample lines blockage (AT-218002)
25/10/2016	09:00	25/10/2016	11:00	Cleaning outlet sample lines (AT-218002)
03/11/2016	12:00	18/11/2016	09:00	Outlet sample lines blockage (AT-218002)
18/11/2016	09:00	18/11/2016	11:00	Cleaning outlet sample lines & Periodic Inspection (AT-218002)
13/12/2016	11:00	13/12/2016	13:00	Nitric Acid flow meter check (FT-21411)
02/01/2017	17:00	07/01/2017	22:00	AOR Temperature transmitter connection problem (TT-21015; some hours from 02/01/2017 until 07/01/2017)
09/01/2017	11:00	11/01/2017	00:00	Outlet sample lines blockage (AT-218002)

Table 2: Observations at EnviNOX® system

For relevant hours a conservative calculation in accordance with the methodology was applied.

Preventive maintenance of analysers: The calibration and maintenance activities, which were carried out onsite by CARBON Egypt, included (but were not limited to) checking and cleaning the filter, checking the pressure regulator, checking the sample handling system, checking the solenoid

valve, checking the analyser with internal diagnostic menus, leak test at sample system, cleaning sample lines with distilled water and manual calibration of the analyser. The time, when the analyser was out of operation for maintenance, lasted for a number of hours during preventive maintenance days. On 31/05/ – 01/06/ & 03/06/2015, 19/08/ & 21/08/2015, 18/11/ & 19/11/2015, 16/02/ & 18/02/2016, 31/05/ & 01/06/2016, 27/09/ & 29/09/2016 and 16/11/ & 17/11/2016 CARBON Egypt checked the analyser system as a whole besides performing check and inspection activities to other system components without taking the analyser out of operation.

Calibration and Maintenance:

All measuring and analytical instruments are being calibrated as defined in the approved CDM PDD "Catalytic N_2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizers Co.", version 4.1 from September 11th, 2013. The plant operator AFC has a Quality Management System (ISO 9001:2008), in which maintenance methods are incorporated. All relevant instruments as project relevant AOR instruments and EnviNO$_X$® instruments have been calibrated accordingly.

Date	Action	Service provider
April-2015	Monthly health check, system diagnostic	CARBON Egypt
May-2015	Periodic inspection	CARBON Egypt
June-2015	Outlet sample lines verification, monthly health check, system diagnostic	CARBON Egypt
July-2015	Cleaning outlet sample lines, monthly health check, system diagnostic	CARBON Egypt
August-2015	Periodic inspection	CARBON Egypt
September-2015	Monthly health check, system diagnostic	CARBON Egypt
October-2015	Monthly health check, system diagnostic	CARBON Egypt
November-2015	Outlet NOx analyser maintenance, periodic inspection	CARBON Egypt
December-2015	Monthly health check, system diagnostic	CARBON Egypt
January-2015	Monthly health check, system diagnostic	CARBON Egypt
February-2015	Periodic inspection	CARBON Egypt
March-2015	Cleaning outlet sample lines, monthly health check, system diagnostic	CARBON Egypt
April-2016	Monthly health check, system diagnostic	CARBON Egypt
May-2016	Periodic inspection	CARBON Egypt
June-2016	Monthly health check, system diagnostic	CARBON Egypt
July-2016	Monthly health check, system diagnostic	CARBON Egypt
August-2016	Monthly health check, system diagnostic, cleaning outlet sample lines	CARBON Egypt
September-2016	Periodic inspection	CARBON Egypt
October-2016	Monthly health check, system diagnostic, cleaning outlet sample lines	CARBON Egypt
November-2016	Periodic inspection	CARBON Egypt
December 2016	Monthly health check, system diagnostic	CARBON Egypt

Table 3: Health and Inspection Checks during this monitoring period

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

>>
No such temporary deviations applied to this monitoring period.

In monitoring period 28 (15/09/2013 – 30/06/2014) a temporary deviation applied. Any reasons for that have been remedied by technical works during the NA plant shutdown on 01/04/2014. Since then, the project fully complies with the registered monitoring plan and applied methodology.
Reference number of PRC: PRC-0490-001
Date of approval by EB: August 19th, 2014

B.2.2. Corrections

>>
No corrections have been applied during this monitoring period, neither to any previous monitoring periods.

B.2.3. Changes to start date of crediting period

>>
No changes to the start date of the crediting period have been applied during this monitoring period, neither to any previous monitoring periods.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

>>
No monitoring plan was included to the registered PDD that was not included at registration, during this monitoring period, neither to any previous monitoring periods.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

>>
No permanent changes from the registered monitoring plan or applied methodology have been applied during this monitoring period, neither to any previous monitoring periods.

B.2.6. Changes to project design of registered project activity

>>
No changes to project design of the registered project activity have been applied during this monitoring period.

B.2.7. Types of changes specific to afforestation or reforestation project activity

>>
N/A

SECTION C. Description of monitoring system

>>

The instruments transmitters continuously provide a 4 – 20 mA analogue signal according to range and units configured. These signals are transmitted to I/O cards (analogue input/output cards) and collected by the Delta V Processor. Resulting digital values are made available in the network to be further processed (e.g. in controller blocks, calculation of other variables) and are stored as 1 second raw data in the protected continuous historian server (CHS).

Modifications of the Delta V, which are protected by security levels by the supplier, are tracked by a Version Control Tool.

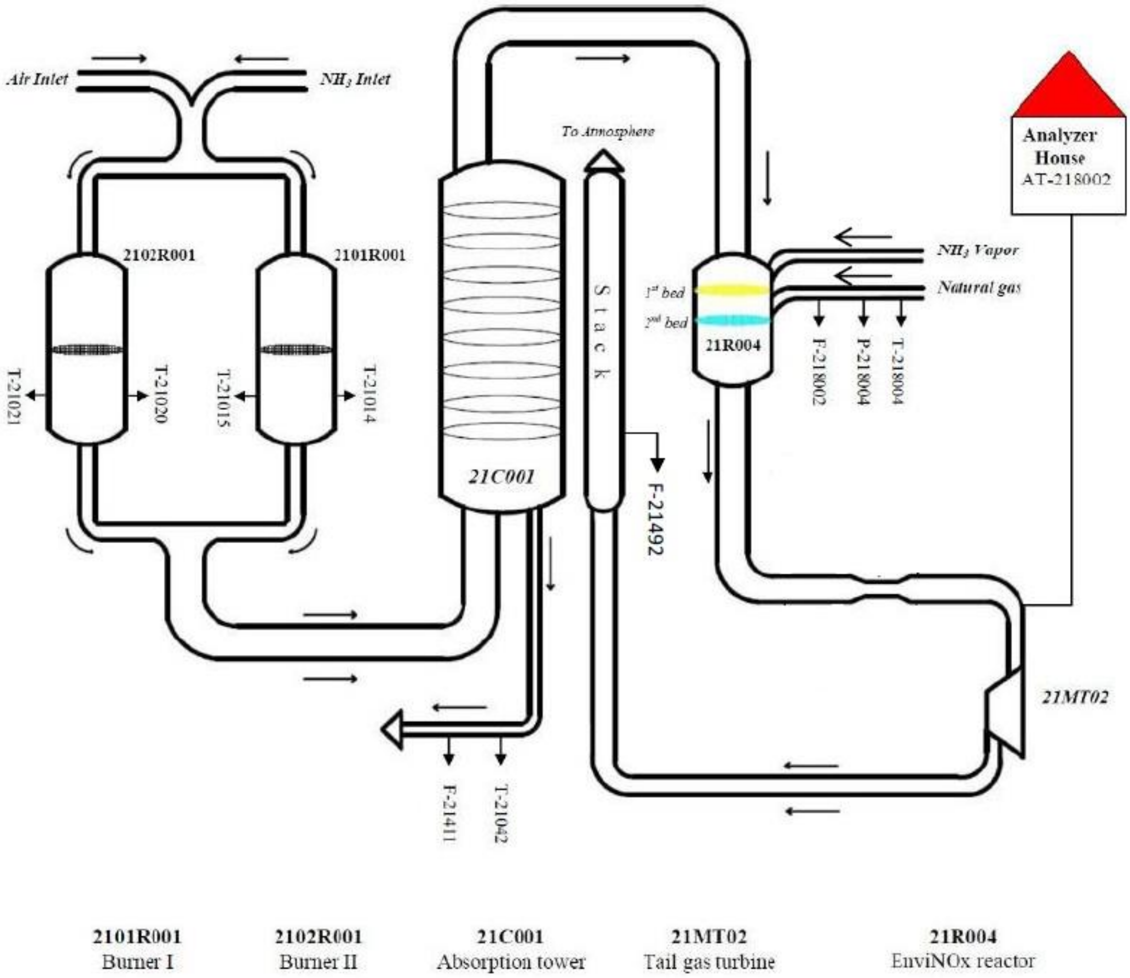

Figure 3: Line diagram showing all relevant monitoring points

The reporting module of the Delta V system automatically generates aggregated daily reports based on the stored raw data from the continuous historian server. Daily reports contain following kinds of data relevant for calculation of claimed emission reductions:

- Concentration of N_2O at outlet of the EnviNOx® system ($v_{i,t,db}$)
- Volume Flow ($V_{t.db,n}$)
- Operating parameters of the nitric acid plant (reactor temperatures, etc.)
- Nitric Acid Production ($P_{production,y}$)
- Quantity of methane combusted in process ($FC_{i,j,y}$)

Relevant parameters as mentioned above are exported from the digitally available daily reports to excel sheets for presentation of required parameters and calculation of baseline emissions (BE_y), project emissions (PE_y, $PE_{CO2,tertiary,y}$ = $PE_{FF,y}$ = $PE_{FC.j,y}$, $PE_{N2O,y}$), and emission reductions (ER_y) according to the formulae as required.

Daily production of the nitric acid plant ($P_{production},_y$) is obtained from AFC records and their respective log sheets and transferred to these excel sheets, which are attached as *Appendix 3* to this monitoring report. Details on source of data can be found directly at the respective parameter tables in *Section D.*

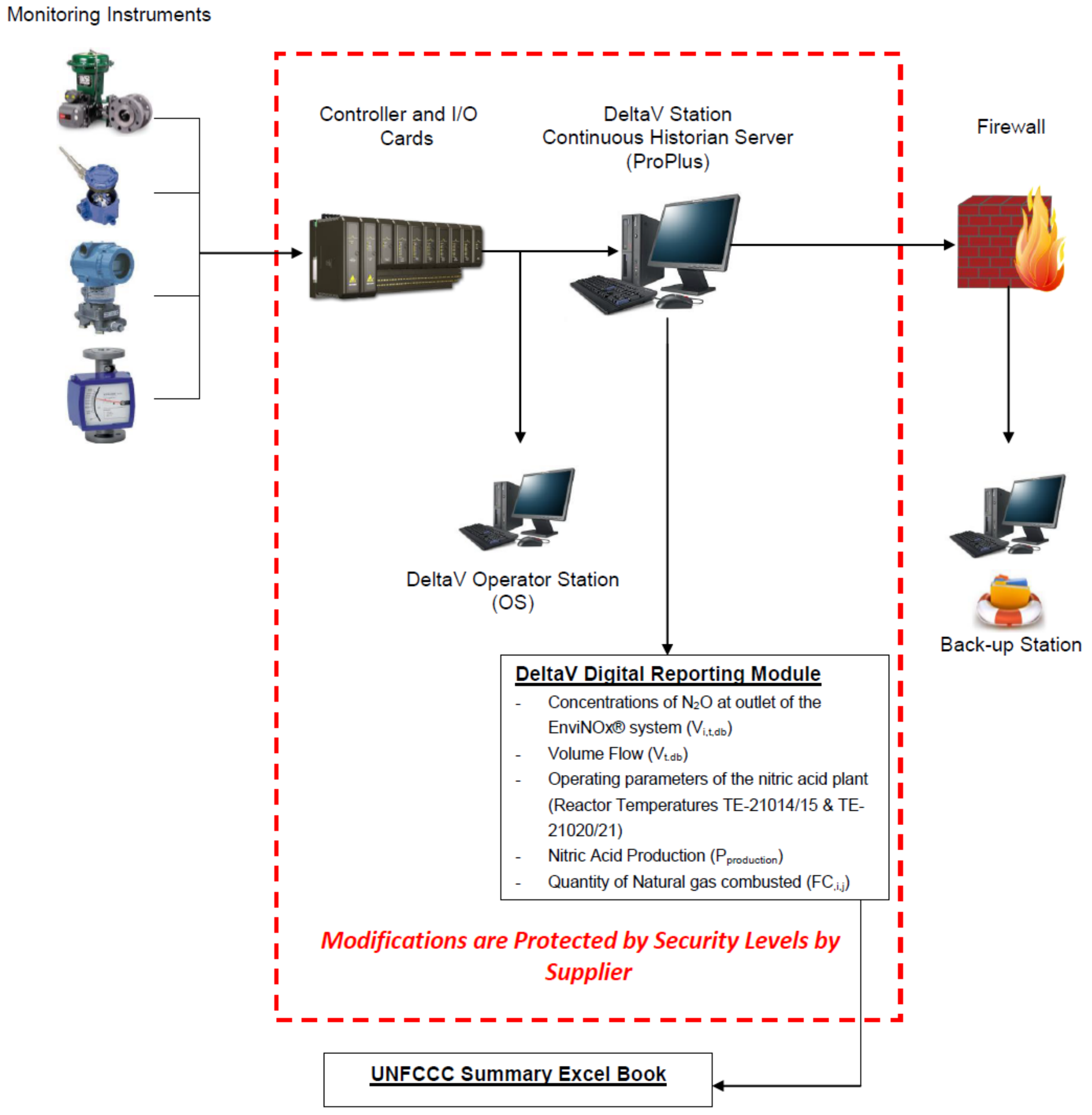

Figure 4: Information flow diagram

This approach and all implemented formulae in the Delta V system fully comply with the approved monitoring methodology ACM0019 v02.0 and the registered project documentation (monitoring plan and respective PDD), considering additional guidance by the CDM Issuance Team.

1. Roles and responsibilities of personnel

Project Operator is Abu Qir Fertilizer Co. S.A.E., the biggest fertilizer company in Africa. AFC was founded as a joint stock company located and registered in the Alexandria Province under Egyptian law in 1976 and is the market leader with a market share of close to 70 % of the local Egyptian fertilizer market. With nearly to 3,000 employees AFC is among the major job providers in Alexandria area. The company is ISO 9001:2008 and ISO 14001:2004 certified and one of the most important companies of the Egyptian industry. The EnviNO$_X$® system is incorporated into AFC's ISO 9001:2008 and ISO 14001:2004 standards.

The operating personnel of the EnviNO$_X$® system has been trained by the technology provider UHDE and the supplier of the digital process control system (Delta V, EMERSON Process Management).

CARBON Egypt is responsible for monitoring and reporting of data under the CDM Project. In terms of performing general supervision and cross-checks of monitoring and reporting data CARBON Austria supports CARBON Egypt. CARBON Austria gives their final approval on the supporting documents as well as the CDM-MR before submitting to the respective DOE for verification.

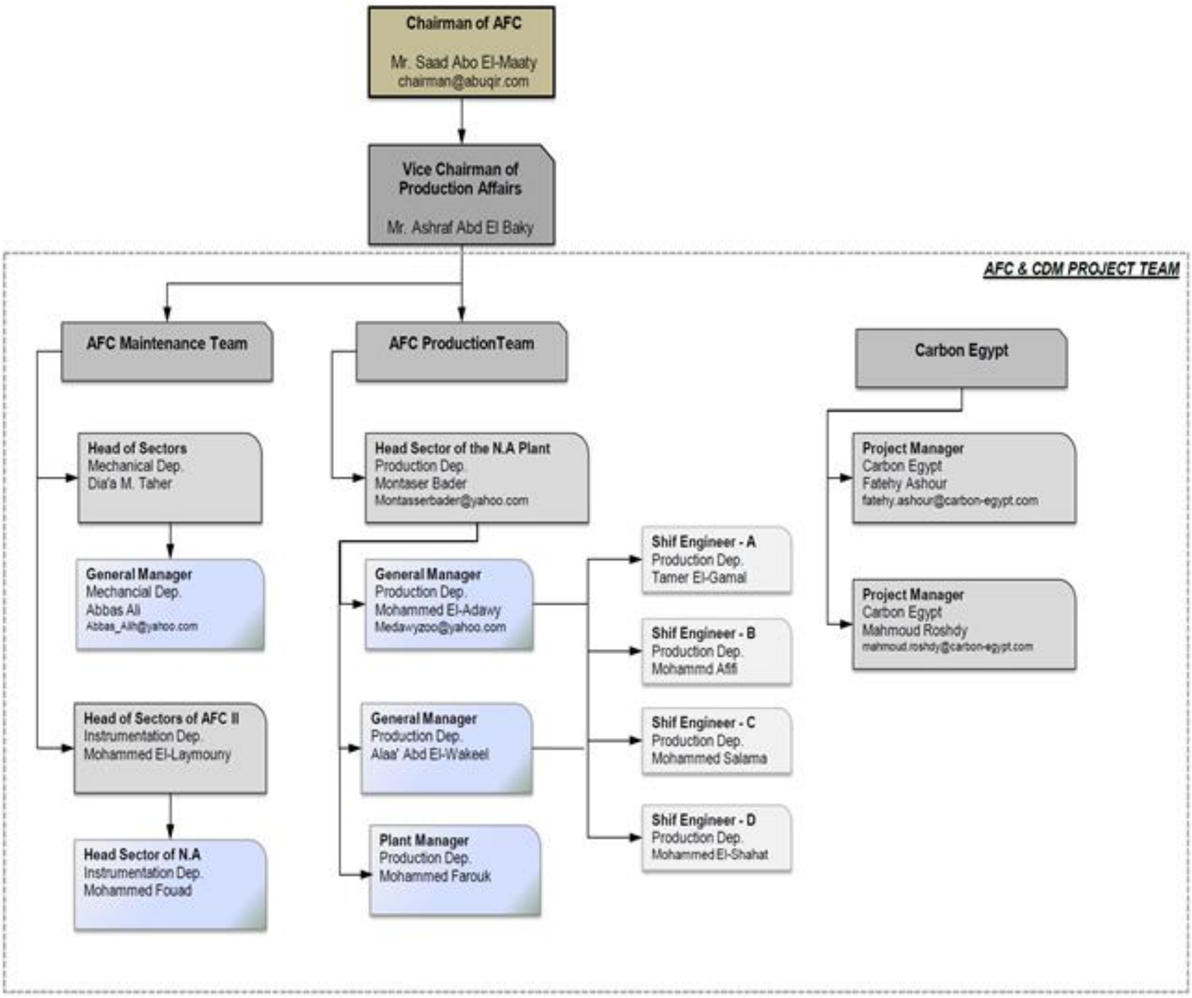

Figure 5: Organizational chart showing structure onsite at Abu Qir

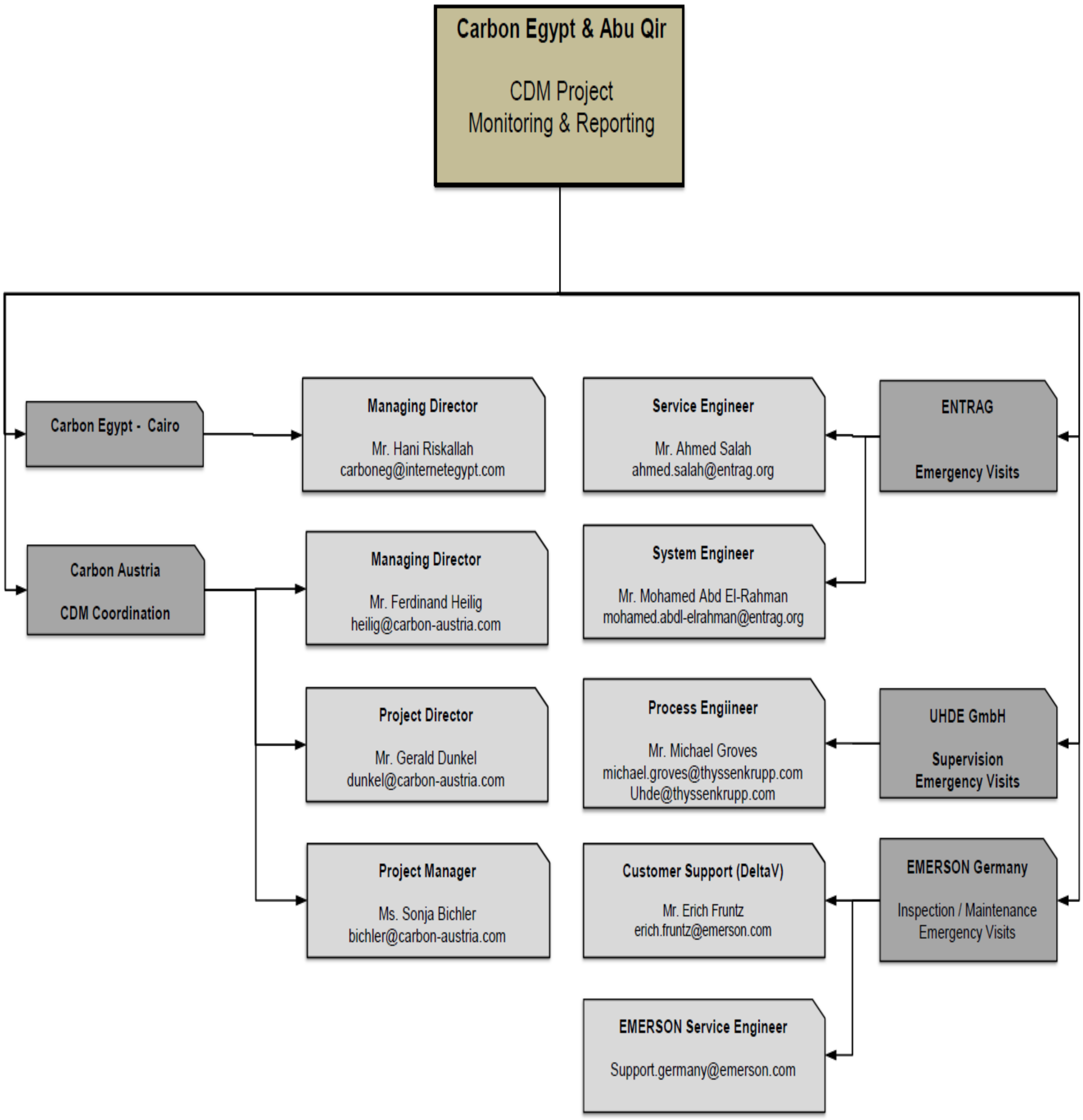

Figure 6: Organizational chart showing organizational structure and technology providers

2. Back up plans / Emergency procedures for monitoring system

a) Back Up Plans for measuring systems / Periodic observation of the automated monitoring system

- EnviNO$_X$® – automatic DCS system:
  The EnviNO$_X$® system is designed for automatic operation, so that activities by the operation personnel are not required during normal operation. However, all alarms and any action taken by the operating personnel (events) are automatically logged at the engineering and the operation station (Alarm & Event List) of the DCS system. All log sheets for alarm & events are exported and therefore digital available (excel files) and can easily be analysed and evaluated.

  Malfunction of system components is indicated on the operator (AFC) console in the control room as an alarm. Occurrence of such an alarm requires the operator to immediately take measures to remedy the problem. This is done by informing AFC instrument department and CARBON Egypt. It is then decided whether the problem can be fixed immediately by AFC or

CARBON Egypt, or whether external support from ENTRAG / EMERSON Germany / UHDE is required (please also refer to above).

- Back Up – EnviNO$_X$® support:
  EMERSON Germany has been contracted to execute periodic onsite inspections. Furthermore, a 24-hours-emergency service and the Delta V Guardian Support are covered by the contract.
  During monthly health checks and periodic inspections the EnviNO$_X$® system, the monitoring equipment required for the CDM project and the automated monitoring system are observed. The system components, measurement devices, calibration works and the automated monitoring system required for the monitoring of the CDM project are covered by the contract. Health check reports and inspection reports are available.
  The responsible project managers of CARBON Egypt are carrying out onsite inspections on a daily basis and AFC is carrying out a site check of the EnviNO$_X$® system once per shift.
  Furthermore, the AFC maintenance department is performing weekly inspection including an onsite check of the EnviNO$_X$® system.
  Supervision is done based on the daily reports by the technology provider UHDE Germany.

- Back Up – Spare Parts on Stock Onsite:
  As a further important part of the back-up plan to deal with events like measuring equipment out of service, CARBON Egypt stocks a comprehensive range of spare part devices onsite. The spare part stock consists basically of 6-month consumables and for two years of operation as recommended by the supplier.

- Back Up – Certified standard gases:
  Pressure levels of standard gases used for the regular, automatic calibration of the inlet and outlet analysers are constantly monitored during the regular inspection by AFC. Spare bottles of standard gases are purchased in proper time. Specifications of standard gases are available and submitted to the DOE for verification.

- Back Up – Procedures:
  In addition to the quality control and quality assurance procedures according to AFC quality management system and in order to avoid possible failures of the automated monitoring system, several procedures are implemented for the project activity. The approach by CARBON Egypt was to ensure immediate response to such alarms and/or malfunctions respectively in the system ("*Procedures for CARBON Egypt CDM Project").* The following table summarizes the periodic observations of the AMS.

Organization	Action	Frequency	Output
CARBON Egypt	Check of Alarm & Event List	Continuously	Txt & excel files
AFC	Shift inspection	Max. 3 times a day	Plant check
CARBON Egypt	Inspection	Daily	EnviNO$_X$® journal
AFC	Inspection	Weekly	AFC report
CARBON Egypt	Health check, system diagnostic	Monthly	Health check report on AMS & EnviNO$_X$®
EMERSON	Inspection visit	Periodically	Inspection report on AMS and EnviNO$_X$®
CARBON Egypt	Inspection	Periodically	Inspection report on AMS and EnviNO$_X$®
UHDE	Supervision	Daily	Plausibility check of daily reporting

Table 4: AMS observation overview

All resulting documents are analysed and evaluated by CARBON Egypt. In case of any upcoming problem or failure of the EnviNO$_X$® system and/or the automated monitoring system CARBON Egypt immediately takes measures to remedy the problem. The provider of the automated monitoring system is available 24 hours a day via hotline.

b) Systematic measures for QA for monitoring data during analyser down times

- Back Up Plans (please refer to the above)

- Check against operating parameters:
  In order to ensure the quality of the monitored data during analyser downtimes CARBON Egypt contracted EMERSON Germany for regular maintenance and calibration services and applied the CDM/QA procedure according to the PDD of “Catalytic N_2O Destruction Project in the Tail Gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.”. Furthermore, CARBON Egypt was trained by EMERSON Germany (system supplier) in order to be able to fulfil required QA procedures.

  The approach how to proceed in cases of analyser downtimes has four steps:
  a) Nitric Acid plant in normal operation: If there is a downtime of concentration measurements, CARBON Egypt provides suitable operating parameters to demonstrate that the nitric acid plant is operating under normal conditions (e.g. Ammonia Oxidation Reactors´ temperature – h_y) and that the abatement system is working properly and not being bypassed, underperforming or failing.
  b) EnviNOx® system in normal operation: CARBON Egypt provides suitable operating parameters to demonstrate that the EnviNOx® system is operating under normal conditions and has reached normal efficiency and hence is working properly and not being bypassed, underperforming or failing.
  c) Recalculation: In order to ensure a conservative determination of emission reductions for hours with analyser downtimes, recalculation is done according to the applied methodology ACM0019 v02.0: *If data for the N_2O concentration is not available for more than 1/3 of any hour while the plant was in operation, the value for that hour shall be replaced with the maximum value of N_2O concentration observed during the monitoring period. Values observed during five operating hours before and after a plant start-up and shut-down shall not be used for the determination of the maximum.*
  d) Check parameters before and after analyser downtime: Operating parameters are compared with values prior and after the analyser was out of operation or out for maintenance to ensure that those values are within the same range.

This approach guarantees a conservative estimation of emissions reductions during AMS downtimes.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/parameter:	**Operating pressure**
Unit	kPa
Description	Operating pressure of the ammonia burner
Source of data	Manufacturer’s specifications
Value(s) applied	**383** (equivalent to 3.83 barg)
Choice of data or measurement methods and procedures	None
Purpose of data	The parameter is used to determine whether the nitric acid plant operates at a low, medium or high pressure
Additional comments	N/A

Data/parameter:	$EF_{historical}$
Unit	kg N_2O/t HNO_3
Description	Historical baseline emission factor of the nitric acid plant
Source of data	Historical information from issuance reports of CDM-PDD documents
Value(s) applied	**7.23**
Choice of data or measurement methods and procedures	Plants that used AM0028 in the first crediting period shall use the lowest baseline emission factor obtained in one calendar year, from 1 January to 31 December, obtained during the first crediting period; AFC plant used AM0028 in the first crediting period accordingly the lowest baseline emission factor obtained in one calendar year, from 1 January to 31 December, obtained during the first crediting period is used. Calculation of $EF_{historical}$ is based on actual data of overall historical baseline emission factor of the nitric acid plant of the first crediting period from issuance reports of CDM-PDD.
Purpose of data	Calculation of baseline emissions
Additional comments	This value will remain constant over the second and third crediting period.

Data/parameter:	$EF_{default,y}$
Unit	kg N_2O/t HNO_3
Description	Default emission factor according to the operating pressure of the ammonia burner in year *y* (related to 100 per cent pure acid)
Source of data	According to PDD and methodology ACM0019 v02.0
Value(s) applied	See table below
Choice of data or measurement methods and procedures	None
Purpose of data	Calculation of baseline emissions
Additional comments	The decrease in the value for the baseline emission factor over time is to reflect the technological development.

Year	Medium pressure (200 – 600 kPa)
2013	8.4
2014	8.2
2015	8.0
2016	7.8
2017	7.6
2018	7.4
2019	7.2
2020	7

Data/parameter:	$EF_{new,y}$
Unit	kg N_2O/t HNO_3
Description	Baseline N_2O emission factor for nitric acid production in year *y* (related to 100 per cent pure acid)
Source of data	According to PDD

Value(s) applied	<table><tr><th>Year</th><th>Emission factor (kg N_2O/t HNO_3)</th></tr><tr><td>2013</td><td>3.70</td></tr><tr><td>2014</td><td>3.50</td></tr><tr><td>2015</td><td>3.40</td></tr><tr><td>2016</td><td>3.20</td></tr><tr><td>2017</td><td>3.00</td></tr><tr><td>2018</td><td>2.80</td></tr><tr><td>2019</td><td>2.70</td></tr><tr><td>2020</td><td>2.50</td></tr></table>
Choice of data or measurement methods and procedures	None
Purpose of data	Calculation of baseline emissions
Additional comments	The decrease in the value for the baseline emission factor over time is to reflect the technological development.

Data/parameter:	$\mathbf{P_{product,max}}$
Unit	t HNO_3
Description	Design capacity of nitric acid production during the first crediting period
Source of data	Manufacture's specifications
Value(s) applied	**700,800**
Choice of data or measurement methods and procedures	N/A
Purpose of data	Calculation of baseline emissions
Additional comments	This parameter is only for project activities applying case 1.

Data/parameter:	$\mathbf{GWP_{N2O}}$
Unit	t CO_2e/t N_2O
Description	Global warming potential of N_2O valid for the commitment period
Source of data	Relevant decisions by the CMP, according to PDD and methodology ACM0019 v02.0
Value(s) applied	**298**
Choice of data or measurement methods and procedures	None
Purpose of data	Calculation of baseline and project emissions
Additional comments	N/A

Parameters from "Tool to determine the mass flow of a greenhouse gas in a gaseous stream"

Data/parameter:	$\mathbf{R_u}$
Unit	Pa.m³/kmol.K
Description	Universal ideal gases constant
Source of data	"Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 03.0.0)
Value(s) applied	**8,314**
Choice of data or measurement methods and procedures	Specified in the tool

Purpose of data	Determining the mass flow of a greenhouse gas in a gaseous stream Calculation of project emissions
Additional comments	N/A

Data/parameter:	**MM_i**
Unit	kg/kmol
Description	Molecular mass of greenhouse gas i
Source of data	"Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 03.0.0)
Value(s) applied	**Compound** / **Structure** / **Molecular mass (kg/kmol)**: Nitrous oxide / N_2O / 44.02
Choice of data or measurement methods and procedures	Specified in the tool
Purpose of data	Determining the mass flow of a greenhouse gas in a gaseous stream Calculation of project emissions
Additional comments	N/A

Data/parameter:	**P_n**
Unit	Pa
Description	Total pressure at normal conditions
Source of data	"Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 03.0.0)
Value(s) applied	**101,325 Pa**
Choice of data or measurement methods and procedures	Specified in the tool
Purpose of data	Determining the mass flow of a greenhouse gas in a gaseous stream Calculation of project emissions
Additional comments	N/A

Data/parameter:	**T_n**
Unit	K
Description	Temperature at normal conditions
Source of data	"Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 03.0.0)
Value(s) applied	**273.15 K**
Choice of data or measurement methods and procedures	Specified in the tool
Purpose of data	Determining the mass flow of a greenhouse gas in a gaseous stream Calculation of project emissions
Additional comments	N/A

D.2. Data and parameters monitored

“Annual” or “Yearly” is sometimes mentioned as the “Recording frequency”, as it is defined in the methodology (ACM0019 v02.0) and the Monitoring Plan and meaning the respective parameter during or related to a year “y”. It shall be considered, that “Annual”, “Yearly” and the year “y” is understood as the monitoring period covered by this report, unless otherwise described.

Data/parameter:	$\mathbf{P_{production,y}}$
Unit	$tHNO_3$
Description	Nitric acid produced in year *y*
Measured/calculated/default	Measured
Source of data	Production reports The actual nitric acid production is measured according to the installed instruments. The instrument signals are recorded in the control room. The nitric acid flow is measured using electromagnetic flow meter while the nitric acid temperature is measured using temperature transmitter where the hourly data is recorded automatically by AFC DCS system in log sheet no. 409/1/2/3A/F5. For the nitric acid concentration, analysis is performed in AFC laboratories by measuring the sample density and temperature following the manufacturer procedures to maintain the respective concentration where the result is logged in reporting sheet 410/3/3/F1. These recordings are prepared in accordance with AFC’s quality management system ISO 9001:2008. The data is transferred by CARBON Egypt to an excel book according to the *“Procedures for CARBON Egypt CDM Project”* in order to calculate the HNO_3 production on a 0 – 24h basis. The daily HNO_3 production and the daily average concentration are recorded in sheet no. 409/1/2/3 F1 by AFC. This data is used for cross-check purpose only. The excel book for presentation of data as required by ACM0019 v02.0 including the total hourly HNO_3 production and automatic checks is attached as Appendix 3 to this Monitoring Report.
Value(s) of monitored parameter	**1,095,671** $\mathbf{tHNO_3}$ (during 633 days)
Monitoring equipment	**Meter location:** Located in the nitric acid line, downstream of the absorption tower. Please refer also to *Section C – 1 (Line diagram)* of this Monitoring Report. **FT 21411** Type: Magnetic flow meter Accuracy class: $\pm$0.25% Calibration frequency: Instrument applied requires no regular calibration after factory calibration Maintenance frequency: 2 years from commissioning or general maintenance (meter verification) <u>Calibrated instrument was installed on 20/12/2015 and again on 07/09/2016:</u> **OLD INSTRUMENT** Serial number: 0252528 Date of commissioning: 23/09/2014 07/09/2016 (re-commissioning) Date of calibration: 17/10/2013 Date of latest maintenance: 29/06/2015 (Meter verification) Validity: 28/06/2017

	NEW INSTRUMENT Serial number: 0870188456 Date of commissioning: 20/12/2015 Date of calibration: 18/09/2015 Date of latest maintenance: 31/03/2016 (Meter verification) Validity: 30/03/2018 **TE 21042** Type: Temperature transmitter Accuracy class: ±0.15°C digital accuracy in accordance with IEC 751 Calibration frequency: 2 years New instrument was installed on 20/12/2015: **OLD INSTRUMENT** Serial number: 2551332 Date of penultimate calibration: 28/10/2013 Date of last calibration: 29/06/2015 Validity: 28/06/2017 **NEW INSTRUMENT** Serial number: 09846352 Date of penultimate calibration: 10/09/2015 Date of last calibration: 16/11/2016 Validity: 15/11/2018
Measuring/reading/recording frequency:	Measuring: Continuously Reading: Hourly Recording: Hourly
Calculation method (if applicable):	-
QA/QC procedures:	In order to prove plausibility of HNO_3 production, cross-checks were performed (conversion efficiency). The quality assurance and quality control procedures, in terms of equipment operations and maintenance, have been incorporated in the ISO 9001:2008 and ISO 14001:2004 procedures of AFC. Please refer also to *Section C – 3. Back Up plans / Emergency procedures for monitoring system* of this Monitoring Report and respective sub items *Back Up Plans for measuring systems / Periodically observation of the automated monitoring system* and *Systematic measures for QA for monitoring data during analyser down times*.
Purpose of data:	Calculation of baseline emissions
Additional comments:	The parameter $P_{NA,h}$ (Nitric acid produced in the hour h) represents the hourly value of $P_{production,y}$ and is used for determining $h_{r,y}$ as described in section 5.3.3 of the applied methodology.

Data/parameter:	**h_y**
Unit	h
Description	Number of hours of operation in year *y*
Measured/calculated/default	Measured
Source of data	Measuring device (Please refer to “monitoring equipment” below)
Value(s) of monitored parameter	**14,011 h**
Monitoring equipment	**Meter location:** Located in the two ammonia oxidation reactors. Please refer also to *Section C – 1 (Line diagram)* of this Monitoring Report. **Burner I: TE 21014 and TE 21015**

	Type: Temperature transmitter Accuracy class: ±0.7°C digital accuracy in accordance with IEC 584 Serial number: 2304376 / 2304377 Calibration frequency: 2 years Date of antepenultimate calibration: 03/09/2013 Date of penultimate calibration: 29/06/2015 Date of last calibration: 16/11/2016 Validity: 15/11/2018 **Burner II: TE 21020 and TE 21021** Type: Temperature transmitter Accuracy class: ±0.7°C digital accuracy in accordance with IEC 584 Serial number: 2304378 / 2304379 Calibration frequency: 2 years Date of antepenultimate calibration: 03/09/2013 Date of penultimate calibration: 29/06/2015 Date of last calibration: 16/11/2016 Validity: 15/11/2018
Measuring/reading/recording frequency:	Measuring: Continuously Reading: Hourly Recording: Hourly
Calculation method (if applicable):	The operation temperature of the two oxidation burners ranges from 850 – 910°C (as defined by the technology supplier) and this range corresponds to the real operation hours of the reactor. Therefore, the plant is considered to be in operation when the temperature is in a range from 850 – 910°C. The temperature is reported automatically by two independent measurement points for each burner measuring the temperature at the same time. Instruments TAG numbers: 1. **Burner I:** TE 21014 TE 21015 2. **Burner II:** TE 21020 TE 21021 The values of the instrument with the TAG numbers TE 21015 and TE 21021 were selected as main signals for monitoring the operation temperature; TE 21014 and TE 21020 are used as back-up signals in case of malfunction of the main signals. The information will be stored in electronic records and paper during whole project´s lifetime.
QA/QC procedures:	Periodic calibration of relevant temperature transmitter as above mentioned were performed according to supplier's recommendations. The quality assurance and quality control procedures, in terms of equipment operations and maintenance, have been incorporated in the ISO 9001:2008 and ISO 14001:2004 procedures of AFC.
Purpose of data:	Calculation of baseline and project emissions
Additional comments:	Records to be maintained during project's lifetime

Data/parameter:	$\mathbf{h_{r,y}}$
Unit	H
Description	For tertiary N_2O abatement, Number of hours (*h*) in year *y* where the abatement system is by-passed, underperforming or failed
Measured/calculated/default	Measured

Source of data	Measuring device (Please refer to “calculation method” below.)
Value(s) of monitored parameter	**335 h**
Monitoring equipment	(Please refer to “calculation method” below)
Measuring/reading/recording frequency:	Measuring: Continuously Reading: Hourly Recording: Hourly
Calculation method (if applicable):	AFC nitric acid plant has used AM0028 in the first crediting period, accordingly the abatement system is deemed to be by-passed, not working or failed in the hour h in year y if: $F_{N2O,tailgas,h} > EF_{existing,y} \times P_{NA,h}$ The parameters mentioned above were determined and monitored as explained in the respective sections of this monitoring report: • $P_{NA,h}$ see parameter $P_{production,y}$ • $F_{N2O,tail\ gas,h}$ see parameters $V_{t,db,n}$, $v_{i,t,db}$ and $C_{H2O,t,db,n}$ • $EF_{existing,y}$ needs not to be monitored, since it´s fixed for the crediting period.
QA/QC procedures:	The quality assurance and quality control procedures, in terms of equipment operations and maintenance, have been incorporated in the ISO 9001:2008 and ISO 14001:2004 procedures of AFC.
Purpose of data:	Calculation of baseline and project emissions
Additional comments:	Records to be maintained during project’s lifetime. The parameter $P_{NA,h}$ (Nitric acid produced in the hour h) represents the hourly value of $P_{production,y}$ and is used for determining $h_{r,y}$ as described in section 5.3.3 of the applied methodology.

Parameters from “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”

Data/parameter:	**$V_{t,db,n}$**
Unit	Nm³ dry gas/h
Description	Volumetric flow of the gaseous stream in time interval t on a dry basis
Measured/calculated/default	Measured
Source of data	Measuring device (Please refer to “monitoring equipment” below)
Value(s) of monitored parameter	**239,500 Nm³ dry gas/h** (Standard temperature: 273.15K, standard pressure: 1,013.25 hPa)
Monitoring equipment	**Meter location:** Located in the tail gas line, downstream of the EnviNO$_x$® reactor (21R004) (at Stack). Please refer also to *Section C – 1 (Line diagram)* of this Monitoring Report. **FT-21492** Type: Differential pressure transmitters Manufacturer: SKI Accuracy class: 1.89% - According to QAL1 certificate Check of calibration frequency: 4 weeks according to QAL1 certificate Serial number: 13069588 / FT-21492 Date of last calibration: 16/11/2016 Validity: 14/12/2016 The schedule of the transmitter calibration takes place as per the check of calibration frequency besides the nitric acid plant operation circumstances (safety instructions have to be followed).
Measuring/reading/recording frequency:	Measuring: Continuously Reading: Every 1 second

	Recording: Hourly
Calculation method (if applicable):	Volumetric flow measurement refers to normal conditions. Calculated based on the flow measurement on dry basis plus water concentration (according to Option A of the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”).
QA/QC procedures:	According to European Norm 14181. Calibration and frequency of calibration is according to manufacturer´s specifications. The quality assurance and quality control procedures, in terms of equipment operations and maintenance, have been incorporated in the ISO 9001:2008 and ISO 14001:2004 procedures of AFC. Please refer also to *Section C. – Back Up plans / Emergency procedures for monitoring system* of this Monitoring Report and respective sub-items.
Purpose of data:	Calculation of project emissions
Additional comments:	Option A parameter, according to the applied tool The volume flow is converted to normal conditions according to the applied methodology. Therefore, the respective parameters were determined at normal conditions ($P_t = P_n$ = 101,325 Pa; $T_t = T_n$ = 273.15 K).

Data/parameter:	$v_{i,t,db}$
Unit	Nm³ gas i/Nm³ dry gas
Description	Volumetric fraction of greenhouse gas i in a time interval t on a dry basis
Measured/calculated/default	Measured
Source of data	Measuring device (Please refer to “monitoring equipment” below)
Value(s) of monitored parameter	**1.60*10^{-4} Nm³ gas N_2O / Nm³ dry gas** (Standard temperature: 273.15K, standard pressure: 1,013.25 hPa) An excel book containing recorded daily values (for all days covered by this monitoring period), is attached as Appendix 3 to this Monitoring Report.
Monitoring equipment	**Meter location:** Sample take-off is located in the tail gas line, downstream of the EnviNO$_x$® reactor (21R004) and leads (via sample gas line) to the locked analyser house (located closely to the EnviNO$_x$® reactor), where analysers and standard gases for calibrations are installed. Please refer also to *Section C – 1 (Line diagram)* of this Monitoring Report. **AT 218002** Type: NDIR Analyser Accuracy class: $\pm$1% (zero/span) Serial number: MLT: 990561462895 Calibration frequency: Zero calibration daily (automatically); Span calibration every other day (automatically) Date of last calibration: Done on daily basis Validity: Confirmed by complying with accuracy safe guarding instructions from EMERSON Process Management
Measuring/reading/recording frequency:	Measuring: Continuously Reading: Every 1 second Recording: Hourly
Calculation method (if applicable):	-

QA/QC procedures:	According to European Norm 14181. Calibration should include zero verification with an inert gas (N_2) and at least one reading verification with a standard gas (single calibration gas or mixture calibration gas). Certified (certificates confirming stability of standard) standard gases are used. The quality assurance and quality control procedures, in terms of equipment operations and maintenance, have been incorporated in the ISO 9001:2008 and ISO 14001:2004 procedures of AFC.
Purpose of data:	Calculation of project emissions
Additional comments:	The N_2O concentration is converted to normal conditions according to the applied methodology. Therefore, the respective parameters were determined at normal conditions ($P_t = P_n$ = 101,325 Pa; $T_t = T_n$ = 273.15 K).

Data/parameter:	**$C_{H2O,t,db,n}$**
Unit	mg H_2O/m^3 dry gas
Description	Moisture content of the gaseous stream at normal conditions, in time interval t
Measured/calculated/default	Measured
Source of data	Measurements according to the USEPA CF42 method 4 – Gravimetric determination of water content (latest AST report)
Value(s) of monitored parameter	**2,200 mg H_2O/m^3 dry gas** (equivalent to 0.0022 kg H_2O/m^3 dry gas; highest measured value) Option A of the tool can be applied, as the moisture content is less than 0.05 kg H_2O/m^3 dry gas.
Monitoring equipment	N/A
Measuring/reading/recording frequency:	Measuring / Reading / Recording: Yearly Measurements coincide with the Annual Surveillance Test (associated with requirements of the EN 14181 standard) or the calibration of the flow meter for the gaseous stream.
Calculation method (if applicable):	N/A
QA/QC procedures:	According to USEPA CF 42 method 4
Purpose of data:	Calculation of project emissions
Additional comments:	Option A parameter for proving that the gaseous stream is dry.

Since the N_2O concentration and the volume flow are converted to normal conditions according to the applied methodology the parameters T_t and P_t need not to be monitored.

Parameters from "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"

Data/parameter:	**$FC_{i,j,y}$**
Unit	Nm^3/y
Description	Quantity of fuel type i combusted in process j during the year y
Measured/calculated/default	Measured
Source of data	The natural gas used as reducing agent is measured by standard flow meter. Flow is converted to standard conditions based on temperature and pressure measurement.
Value(s) of monitored parameter	**1,122,415 Nm^3/y**
Monitoring equipment	**Meter location:** Located in the natural gas line, upstream of the EnviNO$_x$® reactor (21R004). Please refer also to *Section C – 1 (Line diagram)* of this Monitoring Report. **FT 218002**

	<u>Calibrated transmitter was installed on 29/06/2015:</u> Type: Natural gas flow meter Accuracy class: +1.6% in accordance with VDI/VDE 3513 Calibration frequency: 2 years **OLD INSTRUMENT** Serial number: 6/191199.001 Date of last calibration: 08/04/2015 Validity: 07/04/2017 **NEW INSTRUMENT** Serial number: 011008523.001 Date of penultimate calibration: 01/04/2015 Date of last calibration: 16/11/2016 Validity: 15/11/2018 **TE 218004** Type: Temperature transmitter Accuracy class: +0.1% of calibrated span Calibration frequency: 2 years Serial number: 2420017 Date of antepenultimate calibration: 03/09/2013 Date of penultimate calibration: 29/06/2015 Date of last calibration: 16/11/2016 Validity: 15/11/2018 **PT 218004** <u>Calibrated transmitter was installed on 29/06/2015:</u> Type: Pressure transmitter Accuracy class: +0.075% of calibrated span Calibration frequency: 2 years **OLD INSTRUMENT** Serial number: 8195466 Date of last calibration: 08/04/2015 Validity: 07/04/2017 **NEW INSTRUMENT** Serial number: 8657991 Date of penultimate calibration: 31/03/2015 Date of last calibration: 16/11/2016 Validity: 15/11/2018
Measuring/reading/recording frequency:	Measuring: Continuously Reading: Every 1 second Recording: Hourly
Calculation method (if applicable):	N/A
QA/QC procedures:	The quality assurance and quality control procedures, in terms of equipment operations and maintenance, have been incorporated in the ISO 9001:2008 and ISO 14001:2004 procedures of AFC. Please refer also to *Section C. – Back Up plans / Emergency procedures for monitoring system* of this Monitoring Report and respective sub-items.
Purpose of data:	Calculation of project emissions
Additional comments:	N/A

Data/parameter:	$w_{C,i,y}$
Unit	tC/mass unit of the fuel type
Description	Weighted average mass fraction of carbon in fuel type i in year y
Measured/calculated/default	Measured
Source of data	Certificate of hydrocarbon supplier
Value(s) of monitored parameter	**0.74 t C/t**
Monitoring equipment	Composition of the delivered hydrocarbon is measured by the supplier and provided on specific certificates.
Measuring/reading/recording frequency:	Measuring; In order to assure conservativeness a certificate from the hydrocarbon supplier is requested at least on a yearly basis.
Calculation method (if applicable):	Composition of the delivered hydrocarbon is measured by the supplier and provided on specific certificates. The mass fraction of carbon is obtained regularly, from which weighted average annual values were calculated.
QA/QC procedures:	It was verified, if the applied value is within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines.
Purpose of data:	Calculation of project emissions
Additional comments:	Applicable where Option A of the tool is used

Data/parameter:	$\rho_{i,y}$
Unit	t/Nm^3
Description	Weighted average density of fuel type i in year y
Measured/calculated/default	Measured
Source of data	Certificate of hydrocarbon supplier
Value(s) of monitored parameter	**$7.51 \cdot 10^{-4}$ t/Nm^3**
Monitoring equipment	Composition of the delivered hydrocarbon is measured by the supplier and provided on specific certificates.
Measuring/reading/recording frequency:	Measuring; In order to assure the conservativeness a certificate from the hydrocarbon supplier is requested on a yearly basis.
Calculation method (if applicable):	Composition of the delivered hydrocarbon is measured by the supplier and provided on specific certificates.
QA/QC procedures:	NA
Purpose of data:	Calculation of project emissions
Additional comments:	Applicable where Option A is used and where $FC_{i,j,y}$ is measured in a volume unit. Preferably the same data source should be used for $w_{C,i,y}$ and $\rho_{i,y}$.

D.3. Implementation of sampling plan

>>

Not applicable for the project activity.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

>>

According to the applied methodology ACM0019 v02.0 the baseline emissions (BE_y) are given by the following equation:

$$BE_y = \begin{pmatrix} min\{P_{production,y}\, ; P_{product,max}\} \times EF_{existing,y} + \\ max\{P_{production,y} - P_{product,max}; 0\} \times EF_{new,y} \end{pmatrix} \times \frac{(h_y - h_{r,y})}{h_y} \times GWP_{N2O} \times 10^{-3}$$

Where:

BE_y	=	Baseline emissions in year *y* ($t\ CO_2e$)
$P_{product,max}$	=	Design capacity ($t\ HNO_3$)
$P_{production,y}$	=	Production of nitric acid in year *y* ($t\ HNO_3$)

$EF_{existing,y}$ = N_2O emission factor for nitric acid plants that have used AM0028 or AM0034 in the first crediting period in year *y* (kg N_2O/t HNO_3)

$EF_{new,y}$ = Baseline N_2O emission factor for nitric acid production in year *y* (kg N_2O/t HNO_3)

GWP_{N2O} = Global Warming Potential of N_2O valid for the commitment period

h_y = Number of hours in year *y* during which the plant was in operation (*h*)

$h_{r,y}$ = Number of hours (*h*) in year *y* where:
(a) For secondary N_2O abatement: the abatement system was not installed, underperforming or failed;
(b) For tertiary N_2O abatement: the abatement system is by-passed, underperforming or failed

The values for the present period are:

Period	BE_y	$EF_{existing,y}$	$EF_{new,y}$	$P_{production,y}$	$P_{production,max}$	h_y	$h_{r,y}$	GWP_{N2O}
	tCO_2e	kg N_2O/t HNO_3	kg N_2O/t HNO_3	$tHNO_3$	$tHNO_3$	h	h	-
19/04/2015 – 10/01/2017	2,303,086	7.23	3.40 (2015) 3.20 (2016) 3.00 (2017)	1,095,671	700,800 (per year)	14,011	335	298

<u>Determination of the baseline N_2O emission factor ($EF_{existing,y}$):</u>

$$EF_{existing,y} = min\{EF_{historical}; EF_{default,y}\}$$

Where:

$EF_{existing,y}$ = N_2O emission factor for nitric acid plants that have used AM0028 or AM0034 in the first crediting period in year *y* (kg N_2O/t HNO_3)

$EF_{historical}$ = Historical baseline emission factor of the nitric acid plant (kg N_2O/t HNO_3)

$EF_{default,y}$ = Default emission factor according to the operating pressure of the ammonia burner in year *y* (kg N_2O/t HNO_3)

If the monitoring period spans across two (or more) calendar years, the baseline emissions (BE_y) shall be calculated separately for each calendar year, first establishing $EF_{existing,y}$, $EF_{new,y}$, $EF_{default,y}$ and then applying this to the nitric acid production of that calendar year.
The values for the present period are:

Period	$EF_{existing,y}$	$EF_{historical,y}$	$EF_{default,y}$ (for medium pressure)
	kg N_2O/t HNO_3	kg N_2O/t HNO_3	kg N_2O/t HNO_3
19/04/2015 – 10/01/2017	7.23	7.23	8.00 (2015) 7.80 (2016) 7.60 (2017)

E.2. Calculation of project emissions or actual net GHG removals by sinks

>>
Project emissions (PE_y) are defined by the following equation:

$$PE_y = PE_{N2O,y} + PE_{CO2,tertiary,y}$$

Where:

PE_y = Project emissions in year *y* (t CO_2e)

$PE_{N2O,y}$ = Project emissions of N_2O from the project plant in year *y* (t CO_2e)

$PE_{CO2,tertiary,y}$	=	Project emissions of CO_2 from the operation of the tertiary N_2O abatement facility in year *y* (t CO_2)

The values for the present period are:

Period	PE_y	$PE_{N2O,y}$	$PE_{CO2,tertiary,y}$
	t CO_2e	t CO_2e	t CO_2e
19/04/2015 – 10/01/2017	276,902	274,602	2,300

<u>Project emissions of N_2O from the project plant ($PE_{N2O,y}$):</u>

$$PE_{N2O,y} = \sum_{1}^{h_y - h_{r,y}} F_{N2O,tailgas,h} \times GWP_{N20} \times 10^{-3}$$

Where:

$PE_{N2O,y}$	=	Project emissions of N_2O from the project plant in year *y* (t CO_2e)
GWP_{N2O}	=	Global warming potential of N_2O valid for the commitment period
$F_{N2O,tail\ gas,h}$	=	Mass flow of N_2O in the gaseous stream of the tail gas in the hour *h* (kg N_2O/h)
h_y	=	Number of hours in year *y* during which the plant was in operation (*h*)
$h_{r,y}$	=	Number of hours (*h*) in year *y* where: (a) For secondary N_2O abatement. Abatement system was not installed, underperforming or failed; (b) For tertiary N_2O abatement. The abatement system is by-passed, underperforming or failed

The values for the present period are:

Period	$PE_{N2O,y}$	$F_{N2O,tail\ gas,h}$	h_y	$h_{r,y}$	GWP_{N2O}
	t CO_2e	kg N_2O/h	h	h	-
19/04/2015 – 10/01/2017	274,602	82.24	14,011	335	298

<u>Determination of $F_{N2O,tail\ gas,h}$:</u>

The amount of N_2O emissions from the tail gas stream of the project plant shall be determined using the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”. In applying the tool, the following provisions apply:

(a) Throughout the crediting periods of the project activity, the N_2O concentration and volume or mass flow of the tail gas are to be monitored continuously. The monitoring system is to be installed and maintained throughout the crediting period based on the European Norm 14181 or any more recent update of that standard;

(b) The monitoring system should provide separate hourly average values for the N_2O concentration and the volume or mass flow of the tail gas based on two seconds (or shorter) interval readings that are recorded and stored electronically. These N_2O data sets shall be identified by means of a unique time/date key indicating when exactly the values were observed;

(c) The correction factors derived from the calibration curve of the QAL2 audit for the monitoring components as determined during the QAL2-test in accordance with EN14181 must be applied to both the N_2O concentration and the volume or mass flow of the tail gas. This can either be applied automatically to the raw data recorded

by the data storage system at the plant or it can be applied to the calculated hourly averages as part of the calculation of project emissions;

(d) If data for either the N_2O concentration or the volume or mass flow of the tail gas are not available for more than 1/3 of any hour while the plant was in operation, the value for that hour shall be replaced with the maximum value of N_2O concentration or volume or mass flow of the tail gas observed during the monitoring period. If data for neither the N_2O concentration nor the volume or mass flow of the tail gas are available for more than 1/3 of any hour while the plant was in operation, the maximum value of mass flow of N_2O calculated during the monitoring period shall be applied to any such hour. Values observed during five operating hours before and after a plant start-up and shut-down shall not be used for the determination of the maximum values;

(e) In the case that the N_2O concentration and the volume or mass flow of the tail gas and by-pass are automatically converted to normal conditions by the AMS during the monitoring process, the parameters P_t and T_t do not need to be monitored except, if applicable, for the purpose of determining the moisture content in the gaseous stream.

As described in the PDD according to the applied tool the mass flow of greenhouse gas i in the gaseous stream in time interval t ($F_{i,t}$) is calculated based on measurements of (a) the total volume flow or mass flow of the gas stream, (b) the volumetric fraction of the gas in the gaseous stream, and (c) the gas composition and water content. The flow and volumetric fraction may be measured on a dry basis or wet basis. The tool covers the possible measurement combinations, providing six different calculation options to determine the mass flow of a particular greenhouse gas (Option A to F).

As stated in the PDD flow measurement on a dry basis is not doable for a wet gaseous stream. Therefore, it is necessary to demonstrate that the gaseous stream is dry to use option A. There are two ways to do this:

a) Measure the moisture content of the gaseous stream ($C_{H2O,t,db,n}$) and demonstrate that this is less or equal to 0.05 kg H_2O/m^3 dry gas; or
b) Demonstrate that the temperature of the gaseous stream (T_t) is less than 60°C (333.15 K) at the flow measurement point.

Option A of the tool (measurement options: volume flow of gaseous stream on dry basis, volumetric fraction on dry or wet basis) was applied, since it was demonstrated by the latest AST that the gaseous stream is dry according to USEPA CF42 method 4. The measured moisture content in the stack gas is less than 0.05 kg/m³ dry gas.

Measuring Sequence	Date	Moisture Content
1	09/06/2015	0.0019 kg H_2O/m^3 dry gas
2	09/06/2015	0.0022 kg H_2O/m^3 dry gas
3	09/06/2015	0.0020 kg H_2O/m^3 dry gas

Table 5: Moisture content measurements

The mass flow of greenhouse gas i ($F_{i,t}$)[5] is determined as follows:

$$F_{i,t} = V_{t,db} \times v_{i,t,db} \times \rho_{i,t}$$

With

$$\rho_{i,t} = \frac{P_t \times MM_i}{R_u \times T_t}$$

[5] $F_{i,t}$ corresponds to the parameter $F_{N2O,tail\ gas,h}$ of the methodology ACM0019 v02.0.

Where:

$F_{i,t}$	=	Mass flow of N_2O in the gaseous stream of the tail gas in the hour *h* (kg N_2O/h)
$V_{t,db}$	=	Volumetric flow of the gaseous stream in time interval t on a dry basis (m^3 dry gas /h)
$v_{i,t,db}$	=	Volumetric fraction of greenhouse gas i in time interval t on dry basis (m^3gas i / m^3 dry gas)
$\rho_{i,t}$	=	Density of greenhouse gas i in the gaseous stream in time interval t (kg gas i/m^3 gas)
P_t	=	Absolute pressure of the gaseous stream in time interval t (Pa)
MM_i	=	Molecular mass of gaseous i (kg/kmol)
R_u	=	Universal ideal gases constant (Pa.m^3/kmol.K)
T_t	=	Temperature of gaseous stream in time interval t (K)

The values for the present period are:

Period	$F_{N2O,tail\ gas,h}$	$\rho_{i,y}$	$V_{t,db,n}$	$v_{i,t,db}$
	kg N_2O/h	kg/Nm^3	m^3 dry gas/h	m^3 N_2O gas /m^3 dry gas
19/04/2015 – 10/01/2017	82.24	1.96	239,500	$1.60*10^{-4}$

For calculation of $F_{N2O,tail\ gas,h}$ as well as application of calibration curves or corrections to data in case of observations and events as described above on an hourly basis, please refer to the excel book which is available as *Appendix 3* to this monitoring report.

Period	$\rho_{i,y}$	P_n	MM_i	R_u	T_n
	kg/Nm^3	Pa	kg/kmol	Pa.m^3/kmol.K	K
19/04/2015 – 10/01/2017	1.96	101,325	44.02	8,314	273.15

Project emissions from the operation of the tertiary N_2O abatement facility ($PE_{CO2,tertiary,y}$):
This emission source only needs to be estimated if a tertiary N_2O abatement facility is installed under the project activity and if fossil fuels are used to operate the facility or re-heat the gas after the facility. This applies to the project activity as a tertiary N_2O abatement facility is installed.

The emissions related to the operation of the N_2O destruction facility include only on-site emissions due to the fossil fuel use as input to the N_2O destruction facility:

$$PE_{CO2,tertiary,y} = PE_{FF,y}$$

Where:

$PE_{CO2,tertiary,y}$	=	Project emissions of CO_2 from the operation of the tertiary N_2O abatement facility in year y (t CO_2)
$PE_{FF,y}$	=	Project emissions related to fossil fuel input to the destruction facility and/or re-heater in year y (t CO_2)

Project proponents shall use the latest version of the “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion” to calculate the project emissions related to fossil fuels used in year y. Specific guidance on the use of the tool are:

- The parameter $PE_{FC,j,y}$ used in the “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion” corresponds to the parameter $PE_{FF,y}$ in this methodology; and
- The element process *j* in the tool corresponds to the consumption of fossil fuels for the operation of the tertiary N_2O abatement facility and/or the re-heating of the tail gas.

It shall be considered that for synchronizing the applied tool with the methodology, “Annual”, “Yearly”, “yr” and the year “y” are understood to cover the same time period unless otherwise explained.

The values for the present period are:

Period	$PE_{CO2,tertiary,y} = PE_{FF,y} = PE_{FC,j,y}$
	tCO_2
19/04/2015 – 10/01/2017	2,300

According to the applied tool CO_2 emissions from fossil fuel combustion in process j are calculated based on the quantity of fuels combusted and the CO_2 emission coefficient of those fuels, as follows:

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

Where:

$PE_{FC,j,y}$	=	Are the CO_2 emissions from fossil fuel combustion in process *j* during the year *y* (tCO_2/yr)
$FC_{i,j,y}$	=	Is the quantity of fuel type *i* combusted in process *j* during the year *y* (mass or volume unit/yr)
$COEF_{i,y}$	=	Is the CO_2 emission coefficient of fuel type *i* in year *y* (tCO_2/mass or volume unit)
i	=	Are the fuel types combusted in process *j* during the year *y*

Option A of the tool was applied, as the chemical composition of the used fossil fuel (i.e. natural gas) was provided by the natural gas supplier.

The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on the chemical composition of the fossil fuel type *i*, using the following approach:

$$COEF_{i,y} = w_{C,i,y} \times \rho_{i,y} \times 44/12$$

$FC_{i,j,y}$ is measured in a volume unit

Where:

$COEF_{i,y}$	=	Is the CO_2 emission coefficient of fuel type *i* (t CO_2/mass or volume unit)
$w_{C,i,y}$	=	Is the weighted average mass fraction of carbon in fuel type *i* in year *y* (t C/mass unit of the fuel)
$\rho_{i,y}$	=	Is the weighted average density of fuel type *i* in year *y* (mass unit/volume unit of the fuel)
i	=	Are the fuel types combusted in process *j* during the year *y*

The values for the present period are:

Period	$PE_{FC,j,y}$	$FC_{i,y,j}$	$COEF_{i,y}$
	tCO_2	Nm^3	tCO_2/Nm^3
19/04/2015 – 10/01/2017	2,300	1,122,415	$2.05*10^{-3}$

E.3. Calculation of leakage

>>

According to the applied methodology (ACM0019 v02.0) any leakage emissions sources are deemed to be negligible.

E.4. Summary of calculation of emission reductions or net GHG removals by sinks

>>

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	GHG emission reductions or net GHG removals by sinks (t CO_2e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	2,303,086	276,902	0	N/A	2,026,184	2,026,184*)

**) Note that actual calculation of emissions reductions as presented in chapters E1 to E4 has been done in the excel book. Rounding in chapters E1 to E4 has just been done for ease of presentation. Please note that conservative rounding has been made for final ER_y calculation only. This can be traced in the excel book attached to this monitoring report as Appendix 3.*

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

>>

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO_2e)	2,214,379 (633 days)	2,026,184 (633 days)

E.6. Remarks on difference from estimated value in registered PDD

>>

The emissions reductions in this Monitoring Period are 2,026,184 tonnes of CO_2 equivalents. The yearly expected emissions reductions for the relevant period according to the registered PDD are 2,214,379 tonnes of CO_2 equivalents (633 days). Hence, the observed emissions reductions are lower than expected.

\- - - - -

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Person/entity responsible for completing the CDM-MR-FORM
Organization name	CARBON EGYPT Ltd.
Street/P.O. Box	2 Simon Bolivar Square, Garden City, P.O. Box 489
Building	-
City	Cairo
State/region	-
Postcode	11461
Country	Egypt
Telephone	+20 2 2792 0100
Fax	+20 2 2792 0200
E-mail	carboneg@internetegypt.com
Website	-
Contact person	Mr. Hani Riskalla
Title	-
Salutation	-
Last name	Riskalla
Middle name	-
First name	Hani
Department	-
Mobile	-
Direct fax	-
Direct tel.	-
Personal e-mail	-

Project participant and/or responsible person/ entity	☒ Project participant (withdrawn as of 04/11/2016) ☐ Responsible person/ entity for completing the CDM-MR-FORM
Organization name	KOMMUNALKREDIT PUBLIC CONSULTING GmbH
Street/P.O. Box	Tuerkenstrasse 9
Building	-
City	Vienna
State/Region	-
Postcode	1092
Country	Austria
Telephone	+43 1 31631-240
Fax	+43 1 31631-104
E-mail	a.amerstorfer@kommunalkredit.at
Website	-
Contact person	Mrs. Alexandra Amerstorfer
Title	-
Salutation	-
Last name	Amerstorfer
Middle name	-
First name	Alexandra
Department	-
Mobile	-
Direct fax	-
Direct tel.	-
Personal e-mail	-

Project participant and/or responsible person/ entity	☒ Project participant (withdrawn as of 04/11/2016) ☐ Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Energie AG Oberösterreich
Street/P.O. Box	Boehmerwaldstrasse 3 – Postfach 298
Building	-
City	Linz
State/Region	-
Postcode	4021
Country	Austria
Telephone	+43 5 9000-0
Fax	+43 800 81 8001
E-mail	erwin.mair@energieag.at
Website	-
Contact person	Mr. Erwin Mair
Title	-
Salutation	-
Last name	Mair
Middle name	-
First name	Erwin
Department	-
Mobile	-
Direct fax	-
Direct tel.	-
Personal e-mail	-

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for completing the CDM-MR-FORM
Organization name	RWE Power AG
Street/P.O. Box	Huyssenallee 2
Building	-
City	Essen
State/Region	-
Postcode	45128
Country	Germany
Telephone	+49 201 12 20222
Fax	+49 201 12 20216
E-mail	vlfocal-point@rwe.com
Website	-
Contact person	Mr. Ludwig Kons
Title	-
Salutation	-
Last name	Kons
Middle name	-
First name	Ludwig
Department	-
Mobile	-
Direct fax	-
Direct tel.	-
Personal e-mail	-

Project participant and/or responsible person/ entity	☒ Project participant ☒ Responsible person/ entity for completing the CDM-MR-FORM
Organization name	CARBON Climate Protection GmbH
Street/P.O. Box	Am Südblick 5/2
Building	-
City	Langenlois
State/Region	-
Postcode	3550
Country	Austria
Telephone	-
Fax	-
E-mail	dunkel@carbon-austria.com
Website	http://www.carbon-climate-protection.com/
Contact person	Mr. Gerald Dunkel
Title	Managing Director
Salutation	-
Last name	Dunkel
Middle name	-
First name	Gerald
Department	-
Mobile	-
Direct fax	+43-2734-32270-99
Direct tel.	+43-2734-32270-30
Personal e-mail	dunkel@carbon-austria.com

Appendix 2. Social Fund

As described in the PDD a Social Fund was established by the project developer and the project operator. This fund contributes to the social and environmental benefit of the people living in the area of the project activity by financing projects. The contribution to the Social Fund and the activities are monitored and reported on an annual basis. The contribution to the Social Fund since start of operation of the CDM project activity was:

- 2006: no issuance of emission reduction certificates
- 2007: 263,230 Euro
- 2008: 292,690 Euro
- 2009: 467,115 Euro
- 2010: 192,851 Euro
- 2011: 517,411 Euro
- 2012: 255,147 Euro
- 2013: 272,049 Euro
- 2014: -
- 2015: 10,550 Euro
- 2016: 21,200 Euro

The total amount was transferred to the AFC Social Fund bank account expeditiously.

By the end of this Monitoring Period the following Social Fund projects have been finished and cleared or are still on-going:

Finished and ongoing projects					
No	**Project**	**Status**	**Status Date**	**Expenses [LE]**	**Estimated [LE]**
1	Environmental surveillance stations	Finished & cleared	6/2012	1,845,168	2,000,000
2	Adding a central unit to the environment surveillance stations in order to connect it with the national netwrok for industrial emissions surveillance	Finished & cleared	12/2010	17,185	
3	Maintenance and fortification project of the roads (Ali Maher) surrounding AFC company	Finished & cleared	12/2010	2,174,622	
4	Medical convoy (Purchasing of necessary cleaning tools, masks and medicine for the adjacent hospital as well as disinfection measurements)	Finished & cleared	12/2010	52,412	
5	Removing Wastes surrounding AFC company	On-going	12/2010	570,000	
6	Water treatment of a drain in district of Adfina city in El-Buharira governate	Finished & cleared	12/2010	45,500	45,500
7	Planting trees on the roads in the surrounding environment	On-going	4/2012	272,303	250,000
8	Renovation and rehabilitation of schools in the surrounding environment	On-going	12/2010	394,268	450,000
9	Agricultural Area: Purchasing equipment for eradicating mosquitoes and flies including pesticides;	On-going	9/2012	299,815	300,000
10	Medical care for students and people around AFC area for medical checkup and endemic diseases (medical convoy 2)	On-going	6/2012	99,392	100,000
11	Making an environmental study of one of the ditches in the area surrounding the company	On-going	6/2012	150,000	300,000
12	Environmental cleaning activities around AFC area	On-going	4/2013	290,426	500,000
13	Establishment of bridges on Rakta canal for serving residents around AFC area	On-going	4/2012	628,975	750,000
14	Donating for an equipped ambulance for Jone medical center for quick help	On-going	4/2012	431,955	475,000
15	Financing the tools and applications under the cooperation protocol between AFC and Faculty of Science for treatment of El-Amya drainage canal	On-going	6/2012	847,270	1,000,000
16	Construction of a reading and celebration hall	On-going	4/2012	244,252	300,000
17	Finalizing the import of charcoal kiln	Finished & cleared	6/2011	115,000	115,000
18	School development project	On-going	11/2012	169,480	300,000
19	Medical clinic project (Houd 9 area)	On-going	12/2012	144,076	200,000
20	Developing & upgrading project of the environmental affairs agency branch in Alexandria	On-going	4/2013	226,179	500,000
21	Maintaning and strengthening the roads surrounding the company	On-going	4/2013	742,061	3,600,000
22	Medium sized fire truck	On-going	6/2015	2,722,581	2,820,000
23	supporting the installation of smokestack monitoring devices	On-going	7/2014	922,039	1,000,000
	Total amount spent	**cleared**	**6/2015**	**13,404,960**	
	(including estimate)				**17,802,534**

AFC and the local DNA (EEAA) commonly agreed on the funding of the above mentioned and approved projects. Furthermore, AFC and EEAA agreed on the funding of several new projects. They are currently in the design phase.

Designed Projects				
No	**Project**	**Status**	**Status Date**	**Estimated [LE]**
1	Project of Rakta lake annual cleaning works	Design	9/2012	To be defined
2	Covering the canal and the drains on both side of Ali Maher 's road	Design	12/2012	2,500,000
3	Developing environmental projects in Alexandria	Design	9/2012	135,000
4	complete the furniture work of reading and celebration hall	Design	12/2012	150,000
5	Developing the post office of the company's residental city	Design	12/2012	150,000
6	comperehensive maintainence works for fertilizer preparatory / secondary schools	Design	12/2012	1,500,000
	Total amount estimated		**6/2015**	**4,435,000**

The process of decision making between the plant operator AFC and the local DNA (EEAA) ensures the highest possible social and environmental integrity of projects funded by the AFC Social Fund.

All relevant documents, bank statements and correspondence between AFC and EEAA are submitted for verification.

Appendix 3. Emission Reduction Calculation

An Excel book containing monitored data and calculations of baseline emissions, project emissions and emission reductions and additional checks and information is attached:

MP30_AFC_UNFCCC v1_confidential.xlsx

Please note: This file is used for claiming emission reductions.

- - - - -

Document information

Version	*Date*	*Description*
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: monitoring report