FINAL VALIDATION REPORT

OMNIA N2O ABATEMENT PROJECT II IN SOUTH AFRICA

REPORT NO. 2011-1420

REVISION NO. 01

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FINAL VALIDATION REPORT

Date of first issue: 1 November 2011	ConCert Project No.: PRJC-344267-2011-CCS-NOR
Approved by: Trine Kopperud	Organisational unit: DNV Climate Change and Environmental Services
Client: Omnia Fertilizer, Division of Omnia Group (Pty) Ltd.	Client ref.: Johann Peek

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Summary:

Project Name: Omnia N_2O Abatement Project II
Country: South Africa
Methodology: ACM0019 **Version:** 01.0.0
GHG reducing Measure/Technology: To reduce N_2O emissions in the tail gas of a new nitric acid plant by installing a tertiary catalyst after the absorption unit
ER estimate: 348 138 tCO_2e per year (average)

Size

☒ Large Scale ☐ Small Scale

Validation Phases:

☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues

Validation Status

☒ Corrective Actions Requested ☒ Clarifications Requested
☒ Issuance of Draft Validation Report for LoA processing
☒ Full Approval and submission for registration ☐ Rejected

In summary, it is DNV's opinion that the project activity "Omnia N2O Abatement Project II" in South Africa, as described in the PDD, version 02 of 12 April 2012 meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0019, version 01.0.0. DNV thus requests the registration of the project as a CDM project activity.

Report No.: 2011-1420	Subject Group: Environment
Report title: Omnia N2O Abatement Project II in South Africa	
Work carried out by: Rafi-Ud-Din Khawaja, Fahad Saleem	
Work verified by: Trine Kopperud	
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Indexing terms

Key words
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Validation
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Abbreviations

AEL	Atmospheric Emission Licence
APPA	Atmospheric Pollution Prevention Act
AST	Annual Surveillance Test
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
GWP	Global Warming Potential

1 EXECUTIVE SUMMARY – FINAL VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the project activity "Omnia N2O Abatement Project II" in South Africa. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is South Africa. The host party fulfils all the criteria of participation and has approved the project and authorised the project participants Omnia Fertilizer, Division of Omnia Group (Pty) Ltd. The DNA from South Africa confirmed that the project assists in achieving sustainable development. The project participant has decided to apply for registration of the CDM project activity without the involvement of an Annex 1 country.

The project correctly applies the baseline and monitoring methodology ACM0019, version 01.0.0 "N_2O abatement from nitric acid production".

The purpose of the project activity is to install and operate a tertiary N_2O abatement catalyst after the absorption unit at a new nitric acid plant. As a result, the project results in reduction of N_2O emissions that is real, measurable and gives long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on average 348 138 tCO_2e per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not change.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV's opinion that the project participants are able to implement the monitoring plan.

In summary, it is DNV's opinion that the project activity "Omnia N2O Abatement Project II" in South Africa, as described in the PDD, version 02 dated 12 April 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0019, version 01.0.0. Hence, DNV requests the registration of the project as a CDM project activity.

Oslo, 19 April 2012

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CDM Validator
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2 INTRODUCTION

Omnia Fertilizer, Division of Omnia Group (Pty) Ltd. has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the Omnia N2O Abatement Project II project in South Africa (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assessment of the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0019 (version 01.0.0). The validation was based on the recommendations in the Validation and Verification Manual /38/.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk review of the project design documentation

The following tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

/1/ N.serve Environmental Services GmbH and Omnia Fertilizer, Omnia Group (Pty) Ltd.: *CDM-PDD for project activity "*Omnia N2O Abatement Project II*" in* South Africa, Version 01 dated 7 October 2011 and version 02 dated 12 April 2012

/2/ Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011

/3/ N.serve Environmental Services GmbH and Omnia Fertilizer, Omnia Group (Pty) Ltd.: Excel spread sheet for emission reduction calculations: *ER_Calculation_Omnia_v2.xlsx ER_Calculation_Omnia_v5_d.xlsx*

/4/ Acceptance email dated 20 July 2011 by Omnia Fertilizer for the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system

/5/ Omnia Fertilizer, Omnia Group (Pty) Ltd.: The ‘‘Board Paper for the Development of a Carbon Development Mechanism Project on the New Nitric acid plant’’ dated 14 July 2011

/6/ Enacted by the Parliament of the Republic of South Africa:National Environmental Management: Air Quality Act 39 of 2004

/7/ Government Notice 248 in Government Gazette 33064 of 31 March 2010, List of Activities and Associated Minimum Emission Standards Identified in terms of section 21 of National Environmental Management: Air Quality Act 39 of 2004.

/8/ The department of environmental affairs, Republic of South Africa letter on regulation of N_2O emissions dated 10 November 2011

/9/ Fazile Dabi District Muncipality: Confirmation of submission for the transitional licence application dated 20 September 2011

/10/ Copy of internal communication (email) between general manager production and CEO dated 17 June 2011 about the EnviNOx upgrade from DeNOx system

/11/ Revised proposal by Uhde GmbH for the EnviNOx upgrade system for the removal of NOx and N_2O in the new nitric plant in Sasolburg, South Africa dated 30 June 2011

/12 Copy of communication (email) between Director Projects, Omnia and Head of Sales, Uhde GmbH dated 30 June 2011 regarding the breakdown of the EnviNOx revised proposal

/13/ Copy of internal communication (email) between Director Projects and CEO of Omnia dated 1 July 2011 regarding the quote conversion form DeNOx unit to EnviNOx unit

/14/ Copy of communication (email) between Head of Sales, Uhde GmbH and Director Projects, Omnia dated 4 July 2011 regarding the scope of the analysis and monitoring equipment (including the scope of EnviNOx and description of the monitoring equipment)

/15/ i-Cert Pty Ltd letter dated 30 September 2011 confirming that the audit required for re-certification of Omnia’s Integrated Management System to ISO 9000 Quality, ISO 14001 and OHSAS 18001 conducted and date agreed for the clearance of any non-conformances

/16/ National Environmental Management Act, 1988 (Act No. 107 of 1998) of South Africa

/17/ Government Gazette, 18 June 2010, Listing notice 2: List of activities and competent authorities identified in terms of Section 24 (c) and 24 (d) of National Environmental Management Act, 1988 (Act No. 107 of 1998)

/18/ PTERSA Environmental Management Consultants: Environmental Assessment report for the construction of a nitric acid and an ammonium nitrate plant for Omnia Fertilizer at Sasolburg dated 30 April 2010

/19/ The department of economic development, tourism, and environmental affairs, Free State Province, South Africa: environmental authorization (Authorization register number: EMS/1c & 25/09/08) for Omnia Fertilizer on 10 June 2010

/20/ Attendance register for the local stakeholder consultation for the N_2O/NOx reduction project at the new nitric acid plant in Sasolburg, dated 30 September 2011

/21/ Copy of the presentation by Johann Peek from Omnia given during the local stakeholder consultation process

/22/ Copy of the question answers for the project activity during the local stakeholder consultation process dated 30 September 2011

/23/ Minutes of meeting for the local stakeholder consultation for the N_2O/NOx reduction project at the new nitric acid plant in Sasolburg, dated 30 September 2011

/24/ Notice from Omnia in Vaalweekblad: for the local stakeholder consultation for the N_2O/NOx reduction project at the new nitric acid plant in Sasolburg dated 12 September 2011

/25/ Letter from the technology supplier (Uhde GmbH) ref. "C-UD-OM-00235: Nitric Acid Plant II Nameplate Capacity" dated 14 November 2011

/26/ Transcript of minutes of the meeting of "140th meeting of the Board of Directors OMNIA HOLDINGS LIMITED on 28 July 2011"

/27/ Department of Environmental Affairs and Tourism: "Application form for registration/provisional registration of schedule process in respect of the atmospheric pollution prevention act, act 45 of 1965, as amended" dated 22 November 2011

/28/ Letter from Fazile Dabi District Muncipality; "Re: Authorisation for the commissioning of the PGAN and Nitric Acid plants at Omnia's Sasolburg factory" dated 10 November 2011

/29/ UNFCCC "Prior consideration of the CDM form" submitted by Omnia Fertilizer, Omnia Group (Pty) Ltd. Dated 07 September 2011

/30/ N.serve Environmental Services GmbH: Prior consideration notice (e-mail communication) to Department of energy (South African DNA) dated 07 September 2011

/31/ CDM Service Agreement between Omnia Fertilizer, a division of Omnia Group (PTY) LTD and N.serve Environmental Services GMBH dated 31 August 2011

/32/ Communication (e-mail) between Omnia & N.serve to hold the local stakeholder consultation meeting dated 6 September 2011

/33/ Contract for basic engineering services and grant of licence rights- Nitric acid and Ammonium Nitrate plant project- between BME (Pty) Ltd. South Africa & Uhde GmbH, Germany dated 14 September 2009

/34/ Contract for detailed engineering and procurement services and supplies-Nitric acid and Ammonium Nitrate plant project- between Omnia Group (Pty) Ltd. South Africa & Uhde GmbH, Germany dated 9 March 2010

/35/ Communication (e-mail) dated 8 November 2011 with Uhde GmbH regarding estimation & confirmation of moisture content in the tail gas

3.1.2 Letters of approval

/36/ Department of Energy, Republic of South Africa (DNA of South Africa): Letter of approval for Omnia N2O Abatement Project II dated 1 March 2012

/37/ DNA of South Africa: South African CDM project portfolio dated up to 29 February 2012 published on DNA of South Africa's website

http://www.energy.gov.za/files/esources/kyoto/kyoto_sa.html

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

/38/ CDM Executive Board: *Validation and Verification Manual*, version 1.2

/39/ CDM Executive Board: *Baseline and monitoring methodology ACM0019*, version 01.0.0

/40/ CDM Executive Board: *Tool to calculate project or leakage CO2 emissions from fossil fuel combustion*, Version 02

/41/ CDM Executive Board: *Tool to determine the mass flow of a greenhouse gas in a gaseous stream*, Version 02.0.0

The main changes between the version of the PDD published for the 30 days stakeholder commenting period and the final version submitted for registration are:

- Section A.1: Version number and date were changed after revision of the PDD
- Section A.2: The estimated emission reductions and the abatement efficiency were revised as per CAR 3, CL 1 and CL 8.
- Section A.4.4: The tables for estimated emission reductions were revised as per CAR 3, CL 1 and CL 8.
- Section A.4.5: A statement was added to confirm that the project is solely financed by Omnia.
- Section B.4: A discussion was added to elaborate on the air quality legislation in South Africa as per CL 3.
- Section B.6.1: A statement was added for the measurement of the parameter $C_{H2O,t,db,n}$ as per CL 9. Also, the method to calculate $COEF_{i,n}$ was updated.
- Section B.6.2: Parameter $w_{C,i,y}$ was added to the list of data and parameters that are available at validation and $NCV_{i,j}$ and $EF_{CO2,\,i,\,y}$ were removed as per CAR 3
- Section B.6.3: Calculation tables were updated as per CAR 3 and CL 1.
- Section B.7.1: Parameter $C_{H2O,t,db,n}$ was added to the monitoring plan as per CL 9.
- Section B.7.1: Parameters $FC_{i,j,y}$ and $w_{C,i,y}$ were added to the monitoring plan while $NCV_{i,j}$ and $EF_{CO2,\,i,\,y}$ were removed as per CAR 3
- Section C.1.1: Starting date of the project activity was revised from 30 June 2011 to 20 July 2011 as per CAR 2.

3.2 Follow-up interviews with project stakeholders

DNV visited the production facility of Omnia Fertilizer in Sasolburg, South Africa and the office of the Department of Energy (South African DNA) in Pretoria, South Africa on 2-3 November 2011. The following persons were interviewed during the said visits.

	Date	Name	Organization	Topic
/42/	2011-11-02	Mr. Johan Peek	Omnia Fertilizer	Project activity as a whole
/43/	2011-11-02	Mr. Eden Jack	Omnia Fertilizer	Project activity as a whole
/44/	2011-11-02	Mr. L. Morrison	Omnia Fertilizer	Instrumentation and Electrical related issues for the project activity
/45/	2011-11-02	Mr. P. Van De	Omnia Fertilizer	Production related issues

		Merwe		for the Nitric acid plant
/46/	2011-11-02	Mr. C. De Bryn	Omnia Fertilizer	Installation and commissioning of EnviNOx
/47/	2011-11-03	Mr. Peet J. Van Rensburg	SHERQ Group Manager	EIA study and Environmental regulations in South Africa
/48/	2011-11-02	Mr. Martin Stilkenbäumer	N.serve	Project activity as a whole, PDD and ER calculations
/49/	2011-11-03	Mr. N.P Tuwani	DNA of South Africa	Host party LoA, Sustainable development indicators, N_2O regulation in South Africa
/50/	2011-11-03	Mr. T.M Rambau	DNA of South Africa	Host party LoA, Sustainable development indicators, N_2O regulation in South Africa

3.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "Omnia N2O Abatement Project II" in South Africa is enclosed in Appendix A to this report.

Table 2 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 2 are listed in Table 3 of the protocol, and changes to the description of the project design as a result of these findings will be addressed in Table 3. Table 2 thus may not reflect all aspects of the project as described in the final PDD submitted for registration.

A corrective action request (CAR) is raised if one of the following occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**) or a **corrective action request (CAR)** if a requirement is not met.*

Validation Protocol Table 2: Requirement Checklist				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD	*Gives reference to documents where the answer to the checklist question or item is found.*	*Means of verification (MoV) are **document review (DR)**, **interview (I)** or any other follow-up actions (e.g., on site visit and telephone or email interviews) and **cross-checking (CC)** with available information relating to projects or technologies similar to the proposed CDM project activity under validation.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A **corrective action request (CAR)** is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A **clarification request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A **forward action request (FAR)** during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/ or clarification requests	***Ref. to checklist question in table 2***	***Response by project participants***	***Validation conclusion***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The validation team's assessment and final conclusions of the CARs and/or CLs.*

Validation Protocol Table 4: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

Figure 1: Validation protocol tables

3.4 Internal quality control

The draft validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification. Prior to final approval and submission for request for registration the report will undergo a final technical review.

3.5 Validation team

				Type of involvement						
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 5.1 competence	Financial expertise*
Team leader (Validator)	Khawaja	Rafi-ud-Din	Norway	✓	✓	✓	✓		✓	
Assessor under training	Saleem	Fahad	Norway	✓	✓	✓			✓	
Technical reviewer	Kopperud	Trine	Norway					✓	✓	

* Not relevant for projects under ACM0019 since the project would be additional in the absence of regulations requiring the abatement of N_2O emissions and thus financial expertise are not needed to assess the project additionality. The operator of the nitric acid plant has no economic incentives to take any N_2O abatement measures because this entails capital and operating costs but no financial benefits.

The qualification of each individual validation team member is detailed in Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections of this report. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the PDD, version 02 dated 12 April 2012. The version 02 of PDD was revised in response to the validation findings and the revisions made in the ER calculations /3/.

4.1 Participation requirements

The project participant is Omnia Fertilizer, Division of Omnia Group (Pty) Ltd. from the host Party South Africa. The project participant has decided to apply for registration of the CDM project activity without the involvement of an Annex 1 country and thus the Annex I part has been removed from the updated PDD version 02 dated 12 April 2012. The host Party (South Africa) meets all relevant participation requirements.

A letter of approval (LoA) /36/ was issued by the DNA of South Africa on 1 March 2012, authorizing Omnia Fertilizer, Division of Omnia Group (Pty) Ltd. of the host Party as project participant and confirming that the project assists in achieving sustainable development.

The letter of approval was received by DNV from the project participants. DNV does not doubt the authenticity of the letter of approval and considers the letter to be in accordance with paragraphs 45- 48 of the VVM /38/. Furthermore, DNV checked the South African CDM project portfolio dated up to 29 February 2012 published on DNA of South Africa's website /37/ and confirmed that the Omnia N2O Abatement Project II was listed in the project portfolio with a project status of PDD under review by the DNA/pending approval by DNA with a date of submission to DNA of South Africa of 22 December 2011. The project was eventually approved by DNA on 1 March 2012.

4.2 Project design

The N_2O abatement project at the new nitric acid plant of Omnia Fertilizer, Division of Omnia Group (Pty) Ltd., South Africa involves the installation of a tertiary abatement system (EnviNOx) in the tail gas of the nitric acid absorption tower. The plant is located at latitude of approx. 26°48'48" South and a longitude of 27°51'23" East within the Omnia Fertilizer property boundary in Sasolburg in the municipality of Metsimaholo, Free State Province, Republic of South Africa. The technology for both the nitric acid plant and the EnviNOx system is provided by Uhde GmbH, Germany. The EnviNOx system involves catalytic reduction of N_2O in the presence of a hydrocarbon like natural gas (as reduction agent). The destruction facility is to be installed between the absorption tower and the tail gas turbine. The facility is expected to reduce up to 98% of N_2O present in the tail gas.

DNV conducted a site visit to assess and verify the accuracy and completeness of the project description. At the time of the site visit, the construction activities of the new nitric acid plant were on going. The plant is expected to be commissioned by April 2012. No equipment/instrument, except for the catalytic reactor vessel, had yet been installed for the EnviNOx system at the time of the site visit. The design of the project was assessed by reviewing the available design documents /3/ /11/ and was found to be as described in the PDD.

The expected lifetime of the new nitric acid plant is 25 years and the plant is not expected to be decommissioned before that. The starting date of the project activity is set as 20 July 2011, which is the date when Omnia placed the order for the EnviNOx system with Uhde GmbH, Germany. The start date of the crediting period is 1 April 2012 or the day of the registration of the project at UNFCCC, whichever occurs later. Moreover, the project participants have chosen a fixed term crediting period of ten years.

DNV considers the project description of the project contained in the PDD version 02 dated 12 April 2012 /1/ to be complete and accurate. The PDD version 02 dated 12 April 2012 complies with the relevant forms and guidance for completing the PDD.

4.3 Application of selected baseline and monitoring methodology

The project activity applies approved methodology ACM0019 version 01.0.0 /39/. In addition the emission reduction calculations make use of "Tool to calculate project or leakage CO_2 emission from fossil fuel combustion" /40/ and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" /41/ as stipulated in the approved methodology ACM0019 version 01.0.0 /39/. The methodology ACM0019 version 01.0.0 is applicable to the project activities which install tertiary N_2O abatement technology in the tail gas of Nitric acid plants. The other applicability criteria of the methodology include:

- In the case that the nitric acid plant started commercial operation before the implementation of the CDM project activity, the project participants shall demonstrate that there was no secondary or tertiary abatement technology installed in the respective nitric acid plant;
- Continuous real-time measurements of the N_2O concentration and the total gas volume flow can be carried out in the tail gas stream after the abatement of N_2O emissions throughout the crediting period of the project activity.
- No law or regulation which mandates the complete or partial destruction of N_2O from nitric acid plants exists in the host country where the CDM project activity is implemented.
- In addition, the applicability conditions included in the tools referred to above apply.

The N_2O abatement technology will be installed at a new nitric acid plant, which is being built at the Omnia Fertilizer's production site in Sasolburg, South Africa. DNV conducted an onsite visit and is able to verify that the new nitric acid plant is still under construction and has not yet started any commercial production.

The plant will be equipped with a complete Automated Monitoring System (AMS), which will be used to measure the real time N_2O concentration and the total tail gas volume flow after the abatement of N_2O emissions throughout the crediting period of the project activity. This was verified by reviewing the design documents of the proposed project /2/ /11/.

No legal requirements exist in South Africa to reduce N_2O emissions from nitric acid plants. This was verified by reviewing a letter from the Department of Environmental Affairs, Republic of South Africa confirming the absence of N_2O regulation in South Africa /8/.

The emission reduction calculations were checked and it was confirmed that all the applicability conditions included in "Tool to calculate project or leakage CO_2 emission from fossil fuel combustion" /40/ and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" /41/ are met (refer to section B.2 in the validation protocol).

Based upon the above assessment, DNV is able to verify that the project activity meets all the applicability criteria of the approved methodology ACM0019 version 01.0.0.

Further assessment of the project's compliance with the applicability criteria of ACM0019 (version 01.0.0) are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A to this report.

4.4 Project boundary

The project's system boundary includes the equipment for the nitric acid production process from the inlet of the ammonia burner to the outlet of the tail gas section. As the project activity introduces tertiary N_2O abatement, any remaining N_2O emissions from the project plant and CO_2 emissions arising from the operation of the tertiary abatement system are included as project emissions in the project boundary. The greenhouse gases included in the system boundary are presented in the table below:

	GHGs involved	*Description*
Baseline emissions	N_2O	N_2O is the main emission source
Project emissions	N_2O, CO_2	Non destructed N_2O and CO_2 produced by the conversion of hydrocarbons (CH_4)
Leakage	None	Any leakage emissions sources associated with the operation of a tertiary N_2O abatement facility are deemed to be negligible.

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by ACM0019 (version 01.0.0). Documents consulted for this purpose are the approved methodology ACM0019, version 01.0.0 /39/ and the PDD version 02 dated 12 April 2012 /1/.

4.5 Baseline identification

The project activity applies approved methodology ACM0019 version 01.0.0 /39/ according to which the only baseline scenario, in the absence of regulations requiring the abatement of N_2O, is that the N_2O is emitted to the atmosphere with no abatement measure being implemented. Since it was confirmed by DNV that there are no regulations requiring the abatement of N_2O in South Africa (by reviewing the letter on regulation of N_2O emissions by the Department of Environmental Affairs, Republic of South Africa dated 10 November 2011 /8/), therefore there exists no other baseline scenario but the one stated above. Also refer to section B.4 of Table 2 for further discussion on "Baseline scenario determination".

DNV is thus able to verify that the approved baseline methodology has been correctly applied to identify a realistic and credible baseline scenario, and that the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PDD version 02 dated 12 April 2012 /1/ and supporting documents. All documentation relevant for establishing the baseline scenario are correctly quoted and interpreted in the PDD version 02

dated 12 April 2012 /1/. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and sectoral policies and circumstances are considered and listed in the PDD version 02 dated 12 April 2012 /1/.

4.6 Additionality

The project activity applies approved methodology ACM0019 version 01.0.0 /39/, which states ''*in the absence of regulations requiring the abatement of N_2O emissions, the operator of the nitric acid plant has no economic incentives to take any N_2O abatement measures because this entails capital and operating costs but no financial benefits. Therefore, the CDM project activity is considered additional*''.

DNV is able to confirm (by reviewing the letter on regulation of N_2O emissions by the Department of Environmental Affairs, Republic of South Africa dated 10 November 2011 /8/) that currently there are no regulations in South Africa which require the abatement of N_2O emissions (also refer to CL 3). This implies that according to the applied methodology ACM0019 version 01.0.0 /39/ the CDM project activity is additional.

4.6.1 Evidence for prior CDM consideration and continuous actions to secure CDM status

The version 01 of PDD dated 7 October 2011 stated the starting date of the project activity as 30 June 2011 (the date on which the project team was communicated to go ahead with the project) but it was DNV's opinion that, as per the guidelines of UNFCCC, the starting date of the project activity should be the earliest date at which either the implementation or construction or real action of a project activity begins. Based on this opinion a corrective action request (CAR 2) was raised in which the project proponent was asked to update the start date of the project activity to 20 July 2011, which is the date when Omnia accepted the Change Order No. 3 for the EnviNOx upgrade system /2/ from Uhde GmbH, thus making it the first concrete action towards the implementation of the project activity. The section C.1.1 of the revised PDD version 02 dated 12 April 2012 /1/ was updated by the project proponent to show the start date as 20 July 2011.

Omnia's nitric acid plant is brand new and is under construction (which DNV confirmed during the site visit audit of 2–3 November 2011). Before the approval of ACM0019 methodology /39/; there existed no approved methodology which could be applicable to new nitric acid plants. Due to this reason (and due to the absence of any regulation for N_2O abatement in South Africa), Omnia had no plans to install any N_2O destruction facility in the new plant. This was verified by reviewing the original design documents of the plant, which were provided to DNV during the site visit. According to the original design of the plant, only a DeNOx unit was to be installed because of the applicable NOx emission regulations in South Africa. It was only after the baseline and monitoring methodology ACM0019 version 01.0.0 /39/ became available on 3 June 2011 that the project proponent decided to get the project registered as a CDM project activity and asked the technology supplier (Uhde GmbH) to provide an updated design of the plant which included EnviNOx system (for NOx and N_2O abatement). The updated design was provided by Uhde GmbH in the form of Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/. The change order was accepted by

Omnia on 20 July 2011 and the costs associated with the installation of the EnviNOx system were approved by the board of directors during their meeting on 28 July 2011.

In order to validate the prior consideration of the CDM activity the following timeline in the project development was verified by DNV during the site visit of 2 -3 November 2011:

- copy of internal communication (email) between general manager production and CEO dated 17 June 2011 about the EnviNOx upgrade from DeNOx system (after ACM0019 version 01.0.0 became available for project registration) /10/,
- Revised proposal by Uhde GmbH for the EnviNOx upgrade system for the removal of NOx and N_2O in the new nitric plant in Sasolburg, South Africa dated 30 June 2011 /11/,
- copy of communication (email) between Director Projects, Omnia and Head of Sales, Uhde GmbH dated 30 June 2011 regarding the breakdown of the EnviNOx revised proposal /12,
- copy of internal communication (email) between Director Projects and CEO of Omnia dated 1 July 2011 regarding the quote conversion form DeNOx unit to EnviNOx unit /13/,
- copy of communication (email) between Head of Sales, Uhde GmbH and Director Projects, Omnia dated 4 July 2011 regarding the scope of the analysis and monitoring equipment (including the scope of EnviNOx and description of the monitoring equipment) /14/,
- the ‘‘Board Paper for the Development of a Carbon Development Mechanism Project on the New Nitric acid plant’’ dated 14 July 2011 /5/,
- the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/, and
- the acceptance email dated 20 July 2011 of Uhde GmbH change order for the EnviNOx upgrade (starting date of the project activity) /4/.

After reviewing the above evidences, it is DNV’s opinion that the proposed CDM project activity complies with the requirements of the latest version of the guidance on prior consideration of CDM.

Furthermore, DNV verified that continuous efforts were made by project proponent to secure CDM status from the starting date of the project activity to the start of validation. This was verified by reviewing the following evidences provided by the project proponent:

- Approval by board of directors during 140th meeting of the Board of Directors OMNIA HOLDINGS LIMITED on 28 July 2011/26/
- Signing of CDM Service Agreement between Omnia Fertilizer and N.serve Environmental Services GMBH dated 31 August 2011 /31/
- Sending of prior consideration notices South African DNA dated 7 September 2011 and to UNFCCC dated 7 September 2011 /29/ /30/
- Holding of local stakeholders’ meeting on 30 September 2011
- Signing of Climate change services agreement between DNV and Omnia Fertilizer dated 10 October 2011

Based on all the above evidences, DNV is of the opinion that continuous efforts were made by project proponent to secure CDM status from the starting date of the project activity to the start of validation.

4.6.2 Identification of alternatives to the project activity

Based on the applied methodology ACM0019 (version 01.0.0), there exists no other alternatives but the project activity itself because in the absence of the project activity N_2O will be emitted to the atmosphere without any abatement measures being implemented. DNV considers the stated alternative to be credible and complete.

4.6.3 Investment analysis

Since the project is developed under ACM0019 (version 01.0.0), the investment analysis is not applicable towards the additionality discussion because as per the methodology, *''in the absence of regulations requiring the abatement of N_2O emissions, the operator of the nitric acid plant has no economic incentives to take any N_2O abatement measures because this entails capital and operating costs but no financial benefits. Therefore, the CDM project activity is considered additional''.* Therefore, no investment analyses are deemed necessary for the project activity.

4.7 Monitoring

The project activity correctly applies baseline and monitoring methodology ACM0019 (version 01.0.0). Emission reductions will be measured from the difference of emissions in the baseline scenario and the project scenario. The baseline emissions will be calculated based on the default baseline emission factor while an Automated Monitoring System (AMS) will be installed to monitor the project emissions. All the parameters and formulae needed for the monitoring as per ACM0019 (version 01.0.0) have been clearly stated in the PDD along with their sources, measurement methods, monitoring and calibration frequencies and QA/QC procedures. The project proponent commits to carry out the quality assurance of the AMS (QAL1, QAL2, AST and QAL3 in accordance with European Norm 14181 of 2004 or any other recent updates of this standard) as required by the methodology ACM0019 (version 01.0.0). Moreover, the procedures of instruments' calibration, data handling and archiving and for dealing with the situation of missing data have been clearly stated in the PDD. The organization structure has been elaborated to sufficient degree and it is stated that the personnel working on the EnviNOx system will be specifically trained for this purpose. Omnia is successfully operating an existing nitric acid plant where similar N_2O abatement system has been installed (which is a registered CDM project activity since May 2007). Based on Omnia's experience with plant operation and CDM, DNV can verify that Omnia is fully capable of implementing the project activity as required by the methodology. In addition, DNV can verify that the project monitoring plan is in complete compliance with the monitoring methodology ACM0019 (version 01.0.0) and the monitoring arrangements described in the monitoring plan are feasible within the project design.

4.7.1 Parameters determined ex-ante

The applied methodology ACM0019 version 01.0.0 /39/ makes use of default emission factors ($EF_{default,y}$), which will be used as the baseline emission factor for ER calculations. The

value of $EF_{default,y}$ ($EF_{BL\ N2O,n}$) varies from 3.90 $kgN_2O/tHNO_3$ (for the year 2012) to 2.50 $kgN_2O/tHNO_3$ (for all the years from 2020 onwards).
Due to the absence of any real time data for stack gas flow and N_2O concentration, the ex-ante project emission calculations have been based on the 'Business as usual emission factor' for N_2O (6.45 Kg $N_2O/tHNO_3$ /3/. This value is an average of the baseline emission factor values taken from the first five monitoring periods of Omnia's existing EnviNOx system on the old nitric acid plant (refer to CL 8 for more details).
Other parameters which were determined ex-ante and were available for validation are described below:
The following parameters are from the applied methodology ACM0019 version 01.0.0 /39/:

''$EF_{default,y}$'': Taken from methodology ACM0019, version 01.0.0 (from 3.90 to 2.50 $kgN_2O/tHNO_3$)
''$GWPN_2O$'': Taken from relevant decisions by the CMP (310 tCO_2e/tN_2O)

The following parameters are from the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (Version 02):

''$w_{C,i,y}$'': Weighted average mass fraction of carbon in fuel type i in year y (0.75 tC/mass unit of fuel). For the estimation of project emissions in the ex-ante calculation it is assumed to use natural gas with 100% Methane.

The following parameters are from the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0) and were determined ex-ante:

''R_u'': Universal ideal gases constant (8 314 Pa,m^3/kmol.K)

''MM_i'': Molecular mass of greenhouse gas *i* (N_2O) (44.02kg/mol)

''P_n'': Total pressure at normal conditions (101 325 Pa)

''T_n'': Temperature at normal conditions (273.15 K)

''$T_{open,n}$'': Fraction of time in monitoring period n during which the by-pass valve on the line feeding the tertiary N_2O abatement facility was open to vent the gas directly. No bypass is to be installed as per the current project design /4/ /11/ therefore a value of 0% has been taken as a conservative assumption.

In addition to the parameters mentioned above, the following parameters were used to calculate the ex-ante emission reductions:

''Business as usual emission factor'': A value of 6.45 Kg $N_2O/tHNO_3$ has been used as a 'business as usual emission fator' for estimating project emissions in the ER calculation sheet /3/. The used value (6.45 Kg $N_2O/tHNO_3$) is an average of the baseline emission factor values taken from the first five monitoring periods of Omnia's existing EnviNOx system (on the old

nitric acid plant), which employs the same technology for N_2O abatement and has the same design for nitric acid plant.

"CH_4 consumption": Methane consumption for the EnviNOx system (0.35 mol/mol N_2O) as stated in the Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/.

DNV is able to verify that all the ex-ante parameters required by ACM0019 version 01.0.0 and the relevant tools have been clearly stated, referenced and used in the ex-ante emission reduction calculations. In the absence of any actual data, project emissions have been estimated by using an average baseline emission factor from Omnia's present EnviNOx system from the old plant, which, in DNV's opinion is a correct and realistic way of determining the project emission. The authenticity and referencing of all the parameters have been clearly described in the ER calculation sheet /3/ and was checked and verified by DNV.

4.7.2 Parameters monitored ex-post

It has been stated in the PDD version 02 dated 12 April 2012 that the plant will be equipped with a complete Automated Monitoring System (AMS), which will be used to measure the real time N_2O concentration and the total tail gas volume flow after the abatement of N_2O emissions throughout the crediting period of the project activity. The following parameters will be monitored continuously:

- Nitric acid production in the monitoring period n ($P_{NA,n}$)
- Mass flow of N_2O in the gaseous stream of the tail gas in the hour h ($F_{N2O,\ tailgas,h}$)
- Fraction of time in monitoring period n during which the by-pass valve on the line feeding the tertiary N_2O abatement facility was open to vent the gas directly to the atmosphere ($T_{open,n}$)
- Project emissions related to fossil fuel input to the destruction facility and/or re-heater in monitoring period n $PE_{CO2,tertiary,n}$
- Weighted average mass fraction of carbon in fuel type i in year y ($w_{C,i,y}$)
- Number of hours in monitoring period n during which the plant was in operation (h_n)
- Quantity of fuel type i combusted in process j during the year y, $FC_{i,j,y}$
- Volumetric flow of the gaseous stream in time interval *t* on a dry basis ($V_{t,db}$)
- Volumetric fraction of greenhouse gas *i* in a time interval *t* on a dry basis ($v_{i,t,db}$)
- Moisture content of the gaseous stream at normal conditions, in time interval *t* ($C_{H2O,t,db,n}$)
- Temperature in the gaseous stream in time interval *t* (T_t)
- Pressure of the gaseous stream in time interval *t* (P_t)

Nitric acid production ($P_{NA,n}$) will be continuously measured by a mass flow meter while the density and concentration will be determined by the laboratory analyses. Mass flow of N_2O in the gaseous stream of the tail gas ($F_{N2O,\ tailgas,h}$) will be measured by stack gas volume flow meter and N_2O analyzer. The current design of the project does not have any option of bypassing the EnviNOx system but in order to comply with the methodology requirements

and also keeping in view the possibility of any future installation of a bypass, the parameter $T_{open,n}$ will be monitored continuously. Project emissions related to fossil fuel input to the destruction facility and/or re-heater in monitoring period n ($PE_{CO2,tertiary,n}$) will be calculated using *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion, Version 02* /40/. For this purpose natural gas consumption by the destruction facility will be measured continuously. Weighted average mass fraction of carbon in fuel type i in year y ($w_{C,i,y}$) will be calculated as per *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion, Version 02* /40/. For this purpose, the values provided by fuel supplier will be used as first preference but if the data is not available from the fuel supplier, the measurements carried out by the project participants will be used instead. The number of hours of operation (h_n) will be taken from Omnia's production logs and through continuous monitoring of the production parameters. Quantity of fuel type i combusted in process j during the year y ($FC_{i,j,y}$) will be monitored by either mass or volume flow meter. Volumetric flow of the gaseous stream (at normal conditions $V_{t,db}$) and volumetric fraction ($v_{i,t,db}$) of greenhouse gas will be monitored by the tail gas volume flow meter and N_2O analyzer respectively. As per Uhde GmbH (the technology supplier), the moisture content of the gaseous stream at normal conditions ($C_{H2O,t,db,n}$) is expected to be between 0.0048 kgH_2O/Nm^3 of dry tail gas (at 1.013 bar, 0^oC) and a maximum value of 0.0066 kgH_2O/Nm^3 of dry tail gas (at 1.013 bar & 0^oC) /35/. In addition, the project proponent has committed to measure the actual moisture content of the tail gas during every AST or the calibration of the tail gas flow meter /1/. The temperature and pressure in the tail gas (T_t and P_t) will be measured by instruments with recordable electronic signal and these instruments will be subject to regular calibrations.

Apart from these parameters, regulatory requirements for N_2O emissions in South Africa will be assessed continuously throughout the crediting period. It is DNV's opinion that the parameters mentioned above are complete as per the requirements of ACM0019 version 01.0.0 /39/ and the relevant tools. The monitoring arrangements described in the monitoring plan are feasible within the project design and the project proponent is fully capable of implementing the monitoring plan.

4.7.3 Management system and quality assurance

Omnia is certified for the ISO 9000 Quality, ISO 14001 Environmental and OHSAS 18001 Occupational Health and Safety Management Systems by an international certification body and is currently in the process of re-certification its Integrated Management System to ISO 9000 Quality, ISO 14001 and OHSAS 18001 standards /15/. Omnia has integrated Management System for the old nitric acid plant and the existing CDM project at the old plant. This was verified by DNV during site visit by reviewing the content of the integrated management system that covers the existing CDM project. Omnia is planning a similar integrated management system for the new plant. Furthermore, Procedures have been identified in the PDD for day-to-day records handling including record keeping, storage of records and processing of performance documentation. It is DNV's opinion that the management, quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved from the project can be reported ex post and verified.

4.8 Algorithms and/or formulae used to determine emission reductions

The emission reduction calculation spreadsheet /3/ has been checked by DNV and the calculations are found to be correctly based on the formulae and assumptions described in the approved methodology ACM0019, version 01.0.0, "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0) /41/ and "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (Version 02) /40/.

Baseline emissions have been estimated based on the default emission factor $EF_{default,y}$ as described in the methodology.

The project emissions comprise of non-destructed N_2O and CO_2 produced from the operation of the tertiary N_2O abatement facility (use of hydrocarbon for catalytic reduction of N_2O). Due to the unavailability of any real time data (at the time of validation) for the total volume flow of tail gas ($V_{t,db}$) and the volumetric fraction of the gas in the gaseous stream ($v_{i,t,db}$), project emissions $PE_{N2O,n}$ have been estimated by using a 'Business as usual emission factor' (6.45 $KgN_2O/tHNO_3$) which is an average of the baseline emission factors from the first five monitoring periods of Omnia's existing N_2O abatement project at the old nitric acid plant (which is a registered CDM project activity). Since both nitric acid plants (old and the new one) employ the same technology & design (by Uhde GmbH) and also since the ex-post emission reductions will be based on the actual project emission calculated by measuring the real time tail gas flow and gas fraction (to be measured after the installation of AMS), the use of the baseline emission factor from the existing plant for estimating the ex-ante project emissions is deemed reasonable and acceptable by DNV.

Project emissions for CO_2 have been based on the methane consumption for the EnviNOx system (0.35 $mol/molN_2O$) as stated in the Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/.

The main uncertainty of the project GHG emissions estimates lies with the performance of the N_2O destruction catalyst. The PDD, during calculation, has taken an efficiency of 98% even though the Change order no.3 for EnviNOx upgrade system /2/ mentions a minimum warranted performance of 94% initially and 90% in the 36 months warranty period. However, Uhde's initial proposal for the EnviNOx upgrade system /11/ dated 30 June 2011 stated the minimum N_2O reduction efficiency of the system to be 98%. DNV agrees with the opinion of project proponent that the tertiary abatement systems (such as EnviNOx) can have efficiencies as high as 99.9%, thus the use of 98% abatement efficiency towards calculation of ex-ante emission reductions is considered reasonable.

Any leakage emissions sources are considered negligible and thus have not been included in the emission reduction calculations as per the methodology ACM0019, version 01.0.0.

Based on the calculations and results presented in the sections above, the implementation of the project activity will result in an average *ex-ante* estimation of emission reduction conservatively calculated to be 348 138 tCO_2e per year for the selected crediting period.

DNV has verified that all assumptions and data used by the project participants are listed in the PDD /1/ and supporting documents /3/, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

4.9 Environmental impacts

As per the Government Gazette of 18 June 2010 /17/ Listing notice 2: List of activities and competent authorities identified in terms of Section 24 (c) and 24 (d) of the National Environmental Management Act, 1988 (Act No. 107 of 1998) /16/, the commencement of new nitric acid plant including storage of its products require environmental authorization. It should be noted that although the nitric acid production process is a listed activity under the Government Gazette of 18 June 2010 /17/ but it has been listed only due to the regulation with regards to NOx and not N_2O emissions.

Based on the Environmental Assessment report for the construction of a nitric acid and an ammonium nitrate plant for Omnia Fertilizer at Sasolburg dated 30 April 2010 /18/, the department of economic development, tourism, and environmental affairs, Free State Province, South Africa issued an environmental authorization on 10 June 2010 for the new nitric acid plant /19/.

It is DNV's opinion that, although under the South African regulations, EIA is not a requirement for N_2O abatement facility, the project proponent, has nevertheless completed the EIA for the new nitric acid plant and have obtained the environmental authorization for the same.

4.10 Comments by local stakeholders

On 30 September 2011 a local stakeholder meeting took place at the Premises of Omnia. Stakeholders were invited for comments and for participation at the local stakeholder consultation by publishing public notices in the local newspapers from 12 to 16 September 2011 /24/. The meeting was attended by three stakeholders. One stakeholder sent an apology for not being able to attend. One of the attendees was from the local government and two of the attendees were from local industry. A presentation was made to them on the details of the project /21/. Positive feedback was received from each of the stakeholders, with no concerns raised /22/ /23/.

DNV has confirmed this by reviewing the newspaper clip dated 12 September 2011 /24/ during the site visit and also the attendance register dated 30 September 2011/20/, the open day presentation /21/, the copy of the responses to the questions received from the local stakeholder /22/, and the minutes of the meeting for the local stakeholder consultation /23/.

No major comments were received except requesting copies of the presentation presented on the open day for stakeholder consultation, sharing the project idea with other companies in the region, and Omnia's role in COP 17.

Based on the discussion and the reviewed evidences stated above, DNV is of the opinion that the local stakeholder consultation was carried out adequately and due accounts have been taken of all stakeholder comments received.

4.11 Comments by Parties, stakeholders and NGOs

The PDD, version 01 dated 7 October 2011, was made publicly available on the CDM website on 12 October 2011 at the following link:

https://cdm.unfccc.int/Projects/Validation/DB/ABUAD74H1XT2BTNBFL0GGNV3WZV7DS/view.html

Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 13 October 2011 to 11 November 2011. No comments were received.

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APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory requirements for Clean Development Mechanism (CDM) project activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	~~CAR 1~~ (OK)
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	~~CAR 1~~ (OK)
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	~~CAR 1~~ OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	~~CAR 1~~ OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	~~CAR 1~~ OK
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~CL 3~~ OK

Requirement	Reference	Conclusion
that would have occurred in the absence of the registered CDM project activity.		
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	~~CL 3~~ OK
About stakeholder involvement		
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
13. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
14. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
17. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements checklist

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity						
A.1	**Title of the project activity (VVM para 55-57)**					
A.1.1	Does section A.1 of the PDD include a clearly identifiable project title, version number of the PDD and date of the PDD?	/1/	DR	☒ Clearly identifiable title of the project activity ☒ Version number of the PDD is included ☒ Date of the PDD is included.	OK	OK
A.1.2	Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/	DR	☒ Yes *If no, list where the PDD is not in accordance:*	OK	OK
A.2	**Description of the project activity (VVM para 58-64 and VVM para 135 and 136 (a) & (c) for small-scale project activities, as applicable)**					
A.2.1	How was the design of the project assessed?	/1/	DR	*What type is the project?* ☒ Greenfield project The proposed CDM project itself (i.e. to reduce N_2O emissions in the tail gas by installing a tertiary catalyst after the absorption unit) will be implemented at a new nitric acid plant that is under construction. It is anticipated that the start-up of this new nitric acid plant will be done in April 2012 as was also confirmed with the client during on-site visit. *How was the design of the project assessed?* ☒ Physical site inspection ☒ Reviewing available designs and feasibility studies *If a physical site inspection is not undertaken,*	OK	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				justify why no site visit was undertaken:		
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR	The construction activities of the new nitric acid plant were on going and are anticipated to be completed by April 2012.	OK	OK
A.2.3	If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO_2e per year), justify the sampling through a statistical analysis:	/1/	DR	*NA*	OK	OK
A.2.4	Is the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity?	/1/	DR	Yes, the PDD covers all relevant aspects of the project.	OK	OK
A.2.5	Does the project activity involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR	No. The project will be implemented at a new nitric acid plant.	OK	OK
A.2.6	Does the project design engineering reflect current good practices?	/1/ /2/	DR	The project design reflects good engineering practice. This new plant is designed by Uhde GmbH with a design production capacity of 350 000 tonnes 100% concentrated nitric acid per year as confirmed from the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/. In addition, the original plant design document needs to be provided. It should also be noted that the Change Order No. 3 for the EnviNOx mentions a nitric acid plant design capacity of 1000 mtpd nitric acid 100% at an operating time of 350 days per year. Thus, the total nameplate capacity of the plant is 350 000 tonnes of 100% concentrated nitric acid per year. While the PDD Version 01 dated 7 October 2011	~~CL 1~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				calculates emission reductions at 400 000 tonnes of 100% concentrated nitric acid per year. This needs to be clarified. In addition, the PDD mentions an abatement efficiency of 99.9%. It has been stated during the site visit audit that the emission reductions are based on an abatement efficiency of 99.5%. However, the Change Order No. 3 for the EnviNOx mentions a minimum warranted performance of 94% initially and 90% in the 36 months warranty period. This needs to be clarified as well what forms the basis for the abatement efficiency of 99.5% and if needed corresponding corrections to the PDD and the ER calculations need to be made and provided to DNV.		
A.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/ /2/ /4/	DR	Yes, the technology is provided by Uhde GmbH, Germany and will result in N_2O emissions reduction. The technology does represent current good practices. DNV has reviewed the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/ and the acceptance email dated 20 July 2011 of Uhde GmbH change order /4/ for the EnviNOx upgrade and is of the opinion that the technology results in a significant better performance.	OK	OK
A.3	**Participation requirements (VVM para 51-54, 125-127)**					
A.3.1	Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	Yes.	~~CAR 1~~	OK
				South Africa (host) / County X / Country Y		
	a) Party has ratified the Kyoto Protocol			☒ Yes ☐ No / ☐ Yes ☐ No / ☐ Yes ☐ No		

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	b) Party has designated a Designated National Authority	☒ Yes ☐ No		☐ Yes ☐ No ☐ Yes ☐ No		
	c) The assigned amount has been determined	☐ Yes ☐ No		☐ Yes ☐ No ☐ Yes ☐ No		
A.3.2	Do the letters of approval meet the following requirements?	/1/ /36/	DR	It has been confirmed from the DNA of South Africa that a draft validation report will be needed for processing the LoA application.	~~CAR 1~~	OK
		South Africa (host)		County X / Country Y	~~CAR 1~~	OK
	a) LoA confirms that Party has ratified the Kyoto Protocol	☒ Yes ☐ No		☐ Yes ☐ No ☐ Yes ☐ No		
	b) LoA confirms that participation is voluntary	☒ Yes ☐ No		☐ Yes ☐ No ☐ Yes ☐ No		
	c) The LoA confirms that the project contributes to the sustainable development of the host country?	☒ Yes ☐ No		NA / NA		
	d) The LoA refers to the precise project activity title in the PDD	☒ Yes ☐ No		☐ Yes ☐ No ☐ Yes ☐ No		
	e) The LoA is unconditional with respect to (a) to (d) above	☒ Yes ☐ No		☐ Yes ☐ No ☐ Yes ☐ No		
	f) The LoA is issued by the respective Party's DNA	☒ Yes ☐ No		☐ Yes ☐ No ☐ Yes ☐ No		
	g) The LoA was received directly by the DNA or the PP	☐ DNA ☒ PP		☐ DNA ☐ PP ☐ DNA ☐ PP		
	h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic	DNV does not doubt the authenticity of the LoA /36/.				
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/ /36/	DR	Yes.	~~CAR 1~~	OK
A.4 Technical description of the project activity (VVM para 58-64)						
A.4.1	Is the project's location clearly defined?	/1/	DR	Yes. Omnia's plant is located at latitude of approx. 26°48'48" South and a longitude of 27°51'23" East. The new plant is under construction and is located within the Omnia Fertilizer property boundary in Sasolburg in the municipality of Metsimaholo, Free State Province, Republic of South Africa.	OK	

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A.5	**Public funding of the project activity**					
A.5.1	In case public funding from Parties including Annex I is used for the project activity, have these Parties provided an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties?	/1/ /5/	DR	*The funding for the project is from Omnia Fertilizer and no public funding from parties including Annex I is used for the project activity.* DNV has reviewed the ''Board Paper for the Development of a Carbon Development Mechanism Project on the New Nitric acid plant'' dated 14 July 2011/5/ and confirmed the additional project costs for the EnviNOx system, which will be borne solely by Omnia Fertilizer. However, the board's approval for the same amount for the EnviNOx system needs to be provided.	~~CL 2~~	OK
B Application of a baseline and monitoring methodology						
B.1	**Methodology applied (VVM para 65-76 and VVM para 136 (b) for small-scale project activities, as applicable)**					
B.1.1	Does the project apply an approved methodology and the correct and valid version thereof? *If during the course of validation the originally applied version of the methodology expires, a CAR shall be raised in Table 3 of the validation protocol. Any new requirements of the revised version of the methodology not yet validated in Table 2 of the validation protocol shall be validated in Table 3 as part of the assessment of the CAR raised.*	/1/	DR	Yes. The project applies approved methodology ACM0019 version 01.0.0 /39/.	OK	OK
B.1.2	If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/ /40/ /41/	DR	Yes, "Tool to calculate project or leakage CO2 emission from fossil fuel combustion" /40/ and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" /41/ have been applied.	OK	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2	**Applicability of methodology (and tools) (VVM para 65-76)** *Insert a row for each applicability criteria of the applied methodology (and tools)*					
B.2.1	How was it validated that project complies with the following applicability criteria: *In the case that the nitric acid plant started commercial operation before the implementation of the CDM project activity, the project participants shall demonstrate that there was no secondary or tertiary abatement technology installed in the respective nitric acid plant?*	/1/ /2/ /4/	DR	This criterion is not applicable since the plant has not yet started commercial production which was confirmed by DNV during the site visit and document reviews as well /2/ /4/.	OK	OK
B.2.2	How was it validated that project complies with the following applicability criteria: *Continuous real-time measurements of the N_2O concentration and the total gas volume flow can be carried out in the tail gas stream after the abatement of N_2O emissions throughout the crediting period of the project activity?*	/1/	DR	DNV has reviewed a copy of communication (email) between Head of Sales, Uhde GmbH and Director Projects, Omnia dated 4 July 2011 regarding the scope of the analysis and monitoring equipment (including the scope of EnviNOx and description of the monitoring equipment). DNV is of the opinion that the continuous real-time measurements of the N_2O concentration and the total gas volume flow can be carried out in the tail gas stream after the abatement of N2O emissions throughout the crediting period of the project activity.	OK	OK
B.2.3	How was it validated that project complies with the following applicability criteria: *No law or regulation which mandates the complete or partial destruction of N2O from nitric acid plants exists in the host country where the CDM project activity is implemented?*	/1/ /6/ /7/ /8/ /9/	DR	The following Acts/Legislations/Government Notifications pertaining to the complete or partial destruction of N_2O have been reviewed by DNV: - National Environmental Management: Air Quality Act 39 of 2004 /6/ - Government Notice of 31 March 2010, List of Activities and Associated	~~CL 3~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Minimum Emission Standards Identified /7/ (developed as per section 21 of National Environmental Management: Air Quality Act 39 of 2004) National Environmental Management: Air Quality Act 39 of 2004 defines greenhouse gas as *gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation, and includes carbon dioxide, methane and nitrous oxide.* Furthermore, para 43 (l) of National Environmental Management: Air Quality Act 39 of 2004 under the ‘‘**Contents of provisional atmospheric emission licences and atmospheric emission licences**’’ states that a provisional atmospheric emission licence and an atmospheric emission licence must specify the greenhouse gas emission measurement and reporting requirements. However, the Government Notice of 31 March 2010, ‘‘List of Activities and Associated Minimum Emission Standards Identified’’ section 16 under subcategory 7.2 (Primary Production of Acids) lists only ‘F as HF’, HCL, SO2, SO3 and NOx. This was further confirmed by the department of environmental affairs, Republic of South Africa in a letter dated 10 November 2011 /8/ the list of activities which results in atmospheric emissions which have or may have significant detrimental effect on the environment, including health social conditions, economic conditions, ecological conditions or		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			cultural heritage was published in the Government Notice 248 in Government Gazette 33064 of 31 March 2010. It was further confirmed in this letter that Nitrous Oxide (N_2O) emissions are currently not limited in terms of the notice referred above. DNV is of the opinion that as per these documents N_2O is not currently regulated in South Africa at the nitric acid plants. DNV was also provided with the registration certificate of 26 April 1984 for the Old nitric acid plant that was issued under the atmospheric Pollution Prevention Act of 1965 for the old nitric acid plant. When DNV inquired about the provisional atmospheric emission licence and atmospheric emission licence as per the requirements of National Environmental Management: Air Quality Act 39 of 2004 for the new plant, it was stated that the permit application for the integrated Air Quality Permit for both the old and the new plant has been submitted with the authorities but the chances are that the permits would not be issued by the end of year 2012. DNV was also provided with the confirmation of submission for the transitional licence application dated 20 September 2011 /9/. However, the copy of the applications itself was not provided to DNV. The copy of the application for the transitional licence needs to be provided to DNV. Furthermore, since the plant is expected to be commissioned before the integrated emission license is issued; further clarification is needed		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				with regards to commissioning the new plant without having the integrated Air Quality Permit from the authorities.		
B.2.4	How was it validated that project complies with the following applicability criteria: *In the "Tools to calculate project or leakage CO_2 emissions from fossil fuel combustion"? and* *In the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream"?*	/1/ /40/ /41/	DR	The approved methodology refers to the "Tools to calculate project or leakage CO_2 emissions from fossil fuel combustion" /40/for the calculation of project emissions related to the operation of tertiary abatement system (EnviNOx). The PDD states that the project will utilize Natural gas as reducing agent for the decomposition of N_2O. Hence, the tool is applicable. The approved methodology also refers to the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" /41/ for the calculation of mass flow of the greenhouse gas *i* in the gaseous stream. The PDD states that the mass flow of greenhouse gas will be determined based on this tool.	OK	OK
B.2.5	Is the selected baseline one of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/	DR	This is pending to CL 3.	~~CL 3~~	OK
B.3	**Project boundary (VVM para 78-80)**					
B.3.1	What are the project's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	The PDD states, "The spatial extent of the project boundary encompasses the facility and equipment for the nitric acid production process from the inlet of the ammonia burner to the outlet of the tail gas section." This is as per the methodology.	OK	OK
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the	/1/	DR	For the baseline scenario only N_2O (from the oxidation of NH_3) is the main GHG included	OK	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	project activity? Give reference to documents considered to arrive at this conclusion.			while the project emissions consist of: 1) The non-destroyed N_2O from the oxidation of NH_3 2) CO_2 emissions from the operation of tertiary abatement system (EnviNOx). Since the activity does not influence/cause any other type of emissions so it can be stated that the identified boundary covers all sources of GHG emissions. Documents consulted for this purpose are the approved methodology ACM0019, version 01.0.0 and the PDD version 01of 7 October 2011.		
B.3.3	Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR	No, there are no other unforeseen emission sources.	OK	OK
B.4	**Baseline scenario determination (VVM para 81-88, 105-107)** *Ensure that the evaluation of all alternatives provided in the PDD and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. Check that all alternatives required to be considered by the methodology are included in the final PDD. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.*					
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/	DR	The only baseline scenario is the unabated emission of N_2O into the atmosphere. Yes, in the absence of any regulations to reduce N_2O emissions, there is no other baseline scenario but	~~CL 3~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				the one stated above. However, this is pending to CL 3.		
B.4.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR	N/A. Since the methodology foresees only one baseline scenario in the absence of regulations.	OK	OK
B.4.3	What is the baseline scenario?	/1/	DR	Emission of the N_2O gas into open atmosphere in the absence of project activity. However, this is pending to CL 3.	~~CL 3~~	OK
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	Yes.	OK	OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	N.A	OK	OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	This is pending to CL 3.	~~CL 3~~	OK
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	This is pending to CL 3.	~~CL 3~~	OK
B.4.8	Is the baseline determination adequately documented in the PDD? • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed	/1/	DR	The relevant national and/or sectoral policies and circumstances are not listed in the PDD as explained in checklist question B.2.3 above. This discussion needs to be included in section B.4 of the PDD.	~~CL 3~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
CDM project activity					
B.5 Additionality determination (VVM para 94-121 and VVM para 137 for small-scale project activities, as applicable)					
B.5.1 What approach/tool does the project use to assess additionality? Is this in line with the methodology?	/1/	DR	As per the methodology, ''*in the absence of regulations requiring the abatement of N_2O emissions, the operator of the nitric acid plant has no economic incentives to take any N_2O abatement measures because this entails capital and operating costs but no financial benefits. Therefore, the CDM project activity is considered additional*'' Further information has been requested from the client with regards to the regulatory requirements under CL 3.	~~CL 3~~	OK
B.5.2 Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	This is pending to CL 3.	~~CL 3~~	OK
B.5.3 Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	This is pending to CL 3.	~~CL 3~~	OK
B.5.4 What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR	N.A. The project additionality is based on the absence of regulation requiring the abatement of N_2O emissions.	OK	OK
Prior consideration of CDM (VVM para 98-103)					
B.5.5 What is the evidence for serious consideration of CDM prior to the time of decision to proceed with the project activity?	/1/ /2/ /4/ /5/	DR	The following timeline in the project development as a CDM activity was verified during the site visit of 2 -3 November 2011: - copy of internal communication (email) between general manager production and CEO dated 17 June 2011 about the EnviNOx upgrade from DeNOx system	~~CAR 2~~ ~~CL 4~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			- Revised proposal by Uhde GmbH for the EnviNOx upgrade system for the removal of NOx and N_2O in the new nitric plant in Sasolburg, South Africa dated 30 June 2011. - copy of communication (email) between Director Projects, Omnia and Head of Sales, Uhde GmbH dated 30 June 2011 regarding the breakdown of the EnviNOx revised proposal - copy of internal communication (email) between Director Projects and CEO of Omnia dated 1 July 2011 regarding the quote conversion form DeNOx unit to EnviNOx unit - copy of communication (email) between Head of Sales, Uhde GmbH and Director Projects, Omnia dated 4 July 2011 regarding the scope of the analysis and monitoring equipment (including the scope of EnviNOx and description of the monitoring equipment) - the ‘‘Board Paper for the Development of a Carbon Development Mechanism Project on the New Nitric acid plant’’ dated 14 July 2011/5/ - the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/ and; - the acceptance email dated 20 July 2011 of Uhde GmbH change order /4/ for the EnviNOx upgrade		

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			It has been stated that the Omnia board of directors approved the proposed project from DeNOx to EnviNOx (for abatement of NOx and N_2O) on 28 July 2011. An email from the CEO of company (Omnia) to the general manager production confirming this was shown to DNV during site visit. However PDF of the email needs to be provided to DNV. It was stated during the site visit that the start date of 30 June 2011 in the PDD version 01 of 7 October 2011 is based on the date on which it was communicated to the responsible project team to go ahead with the project. An email was shown to DNV that was sent to the project responsible team by the general manager production. A PDF copy of that email also needs to be provided to DNV. DNV is of the opinion that the start date as per UNFCCC guidelines should be the earliest date at which either the implementation or construction or real action of a project activity begins. The date on which the project team was communicated to go ahead with the project does not represent the date on which either the implementation or construction or real action of a project activity begins. DNV has also reviewed the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/ and the acceptance email by		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Omnia dated 20 July 2011 of Uhde GmbH change order /4/ for the EnviNOx upgrade. DNV is of the opinion that the start date of the project should be updated in the PDD to the date on which Omnia accepted the change order for the EnviNOx upgrade (i.e. 20 July 2011). It was also stated that even though the board of director approved the EnviNOx upgrade two days after on 22 July 2011, the CEO of the company had verbally agreed with the board of directors on 18 July 2011 based on the Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 and the ''Board Paper for the Development of a Carbon Development Mechanism Project on the New Nitric acid plant'' dated 14 July 2011/5/ and asked the general manager production to accept the change order for the EnviNOx upgrade. If possible any evidences for the events need to be provided.		
B.5.6	If the starting date is after 2 August 2008 and before the global stakeholder consultation, has the DNA and UNFCCC confirmed that the project participants have informed in writing of the project's intention to seek CDM status?	/1/	DR	Based on the discussion above in B.5.5, the starting date of 20 July 2011 is after 2 August 2008 and before the global stakeholder consultation process (that started on 13 October 2011). The prior consideration notices to South African DNA dated 7 September 2011 and to UNFCCC dated 07 September 2011 and are within six months of the project revised start date. The copy of the notices need to be provided to DNV.	~~CL 5~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	Continuous efforts to secure CDM status (only to be completed if starting date is before 2 August 2008)					
B.5.7	What initiatives were taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity?	/1/	DR	Based on the discussions in section B.5.5 of the checklist, the start date of the project needs to be changed to 20 July 2011 from 30 June 2011 as described in the PDD version 01 dated 7 October 2011. The following initiatives were taken by the project participants from the start date (of 20 July 2011) to the start of validation (13 October 2011): - A validation contract was signed with DNV on 10 October 2011. Furthermore, a copy of the contract signed with the project consultant needs to be provided. In addition, evidences of any other initiatives that were taken by the project participants from the start date (of 20 July 2011) to the start of validation (13 October 2011) needs to be provided to DNV.	~~CL 6~~	OK
B.5.8	When did the construction of the project activity start?	/1/ /2/ /4/	DR	DNV has reviewed the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/ and the acceptance email by Omnia dated 20 July 2011 of Uhde GmbH change order /4/ for the EnviNOx upgrade as mentioned earlier. However, it needs to be clarified when did the construction of the project activity itself started. In this regard DNV also needs copies of the contracts (procurement and construction) that were signed for the new nitric acid plant including the DeNOx unit.	~~CL 7~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.9	When was the project commissioned?	/1/	DR	As verified during the site visit of 2-3 November 2011, the project is under construction and has not been commissioned yet.	OK	OK
B.5.10	Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status?	/1/	DR	DNV is of the opinion that the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status; however, further evidences have been requested in this regards.	~~CAR 2~~ ~~CAR 2~~ ~~CL 4~~ ~~CL 5~~ ~~CL 6~~ ~~CL 7~~	OK
	Investment analysis (VVM para 108-114) *The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation. <u>All</u> input parameters need to be assessed.*					
B.5.11	Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/	DR	The project activity does not generate any revenues apart from CDM and it has been clearly reflected in the PDD.	OK	OK
B.5.12	Do any of the alternatives to the project activity involve investment? Is this reflected in the PDD?	/1/	DR	There are no other alternatives other the project activity itself and the project activity requires investment.	OK	OK
B.5.13	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/	DR	Since the project is under ACM0019, the investment analysis is not applicable towards the additionality discussion. As per the methodology, ‘‘*in the absence of regulations requiring the abatement of N_2O emissions, the operator of the nitric acid plant has no economic incentives to take any N_2O abatement measures because this entails capital and operating costs but no financial benefits. Therefore, the CDM project activity is considered*	OK	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				additional''.		
B.5.14	Is the benchmark/discount rate the latest available at the time of decision?	/1/	DR	N.A.	N.A.	N.A.
B.5.15	What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/	DR	N.A.	N.A.	N.A.
B.5.16	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/	DR	N.A.	N.A.	N.A.
B.5.17	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/	DR	N.A.	N.A.	N.A.
B.5.18	Is the time period of the investment analysis and operating time of the project realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/	DR	N.A.	N.A.	N.A.
B.5.19	When a feasibility study report or similar approved by the government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PDD are fully consistent with the FSR and is the period of time between finalization of the FSR and the investment decision adequate?	/1/	DR	N.A.	N.A.	N.A.
B.5.20	How was the amount of output (e.g. sales of electricity) assessed? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	☐ The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval ☐ The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company) ☐ Other approach.	N.A.	N.A.

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Provide details on how the load factor was validated::		
B.5.21	How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how the output price was validated:*	N.A.	N.A.
B.5.22	How were the investment costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements, contracts and annual financial reports related to the project and the project participants *Provide details on how the investment costs were validated:*	N.A.	N.A.
B.5.23	How were the O&M costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how the O&M costs were validated:*	N.A.	N.A.
B.5.24	Describe the assessment of the other input parameters. Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public	N.A.	N.A.

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	projects that have been used for cross-checking in accordance with VVM paragraph 95.			announcements and annual financial reports related to the project and the project participants *Provide details on how other input parameters were validated:*		
B.5.25	Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	N.A.	N.A.	N.A.
B.5.26	Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?	/1/	DR	N.A.	N.A.	N.A.
B.5.27	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/	DR	N.A.	N.A.	N.A.
B.5.28	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/	DR	N.A.	N.A.	N.A.
	Barrier analysis (VVM para 115-118)					
B.5.29	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/	DR	N.A. As per the methodology ACM0019, ''*in the absence of regulations requiring the abatement of N_2O emissions, the operator of the nitric acid plant has no economic incentives to take any N_2O abatement measures because this entails capital and operating costs but no financial benefits. Therefore, the CDM project activity is considered additional*'' and thus the barrier analysis is not needed for the project activity.	N.A.	N.A.
B.5.30	How were the investment barriers assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	N.A.	N.A.	N.A.
B.5.31	How does CDM alleviate the investment barriers?	/1/	DR	N.A.	N.A.	N.A.
B.5.32	Is the project activity prevented by the investment barriers	/1/	DR	N.A.		

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	and at least one of the possible alternatives to the project activity is feasible under the same circumstances?					
B.5.33	How were the technological barriers assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	N.A.	N.A.	N.A.
B.5.34	How does CDM alleviate the technological barriers?	/1/	DR	N.A.	N.A.	N.A.
B.5.35	Is the project activity prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	N.A.	N.A.	N.A.
B.5.36	How were the barriers due to prevailing practise assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	N.A.	N.A.	N.A.
B.5.37	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	N.A.	N.A.	N.A.
B.5.38	Is the project activity prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	N.A.	N.A.	N.A.
B.5.39	How were the other barriers assessed to be real? Are the other barriers substantiated by a source independent of the project participants?	/1/	DR	N.A.	N.A.	N.A.
B.5.40	How does CDM alleviate the other barriers?	/1/	DR	N.A.	N.A.	N.A.
B.5.41	Is the project activity prevented by the other barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	N.A.	N.A.	N.A.
	Common practice analysis (VVM para 119-121)					
B.5.42	What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR	N.A. As per the methodology ACM0019, ‘‘*in the absence of regulations requiring the abatement of N_2O emissions, the operator of the nitric acid plant has no economic incentives to take any N_2O*	N.A.	N.A.

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				abatement measures because this entails capital and operating costs but no financial benefits. Therefore, the CDM project activity is considered additional'' and thus the common practice analysis is not needed.		
B.5.43	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	N.A.	N.A.	N.A.
B.5.44	What is the data source(s) used for the common practice analysis?	/1/	DR	N.A.	N.A.	N.A.
B.5.45	How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	N.A.	N.A.	N.A.
B.5.46	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	N.A.	N.A.	N.A.
B.5.47	What is the conclusion of the common practice analysis?	/1/	DR	N.A.	N.A.	N.A.
	Conclusion					
B.5.48	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	This is pending to CL 3.	~~CL 3~~	OK
B.6	**Calculations of GHG emission reductions**					
	Data and parameters that are available at validation and that are not monitored (VVM para 199-203)					
B.6.1	How was the insert parameter available at validation verified?	/1/	DR	''$EF_{default,y}$'': The value of the parameter ''$EF_{default,y}$'' is taken from methodology ACM0019, version 01.0.0 (from 3.90 to 2.50 $kgN_2O/tHNO_3$) ''GWP_{N2O}'': Taken from relevant decisions by the CMP (310 tCO_2e/tN_2O) Parameters from the "Tool to calculate project or	OK	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			leakage CO2 emissions from fossil fuel combustion" (Version 02): ''$NCV_{i,j}$'': Taken from IPCC default values at the upper limit of uncertainty at a 95% confidence interval as provided in table 1.2 of chapter 1 Vol. 2 (Energy) of the 2006 IPCC Guidelines in National GHG Inventories (50.4 GJ/ton) ''$EF_{CO2, i, y}$'': Taken from IPCC default values at the upper limit of uncertainty at a 95% confidence interval as provided in table 1.4 of chapter 1 Vol. 2 (Energy) of the 2006 IPCC Guidelines in National GHG Inventories (0.0583 tCO_2/GJ) Parameters from the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0): ''R_u'': Universal ideal gases constant (8 314 Pa,m^3/kmol.K) ''MM_i'': Molecular mass of greenhouse gas *i (*N_2O*) (44.02kg/mol)* ''P_n'': Total pressure at normal conditions (101 325 Pa) ''T_n'': Temperature at normal conditions (273.15		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			K) ''$T_{open,n}$'': Fraction of time in monitoring period n during which the by-pass valve on the line feeding the tertiary N_2O abatement facility was open to vent the gas directly. The current design of the project does not have any option of bypassing the EnviNOx system but in order to comply with the methodology requirements and also keeping in view the possibility of any future installation of a bypass, the parameter $T_{open,n}$ will be monitored continuously. Therefore, a value of 0% has been used for this parameter. In addition, the following parameters have been used for calculating ex-ante emission reductions: ''Business as usual emission factor'': 6.45 Kg $N_2O/tHNO_3$. The value has been used to estimate ex-ante project emissions in the ER calculation sheet /3/. The used value is an average of the baseline emission factor values taken from the first five monitoring periods of Omnia's existing EnviNOx system (on the old nitric acid plant), which employs the same technology for N_2O abatement and has the same design for nitric acid plant. "CH_4 consumption": Methane consumption for the EnviNOx system (0.35 mol/molN_2O) as		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				stated in the Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/		
Baseline emissions (VVM para 89-93)						
B.6.2	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The baseline emission calculations are documented in the PDD and also the calculation spread sheet was reviewed by DNV during the on-site visit. The project proponent has agreed to provide the updated calculation spread sheet as per the relevant CARs and CLs.	~~CL 8~~	OK
B.6.3	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Pending to receiving the calculation spread sheets.	~~CL 8~~	OK
B.6.4	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Pending to receiving the calculation spread sheets.	~~CL 8~~	OK
Project emissions (VVM para 89-93)						
B.6.5	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	In the emission reductions calculation sheet *ER_Calculation_Omnia_v2.xlsx* /3/ the parameter $FC_{i,j,y}$ under the $PE_{CO2,tertiary,n}$ tab has been wrongly calculated. This needs to be corrected. The project emission calculations are documented in the PDD and also the calculation spread sheet was reviewed by DNV during the on-site visit. The project proponent has agreed to provide the updated calculation spread sheet as per the relevant CARs and CLs.	~~CAR 3~~ ~~CL 8~~	OK
B.6.6	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Pending to receiving the calculation spread sheets.	~~CL 8~~	OK
B.6.7	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Pending to receiving the calculation spread sheets.	~~CL 8~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	Leakage (VVM para 89-93)					
B.6.8	Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	As per methodology ACM0019, version 01.0.0, any leakage emissions sources are deemed to be negligible.	OK	OK
B.6.9	Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	N.A.	N.A.	N.A
B.6.10	Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	N.A.	N.A.	N.A
	Emission Reductions (VVM para 89-93)					
B.6.11	Algorithms and/or formulae used to determine emission reductions: • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/1/	DR	Pending to receiving the calculation spread sheets.	~~CAR 3~~ ~~CL 8~~	OK
B.7	**Monitoring plan (VVM para 122-124)**					
	Data and parameters monitored					
B.7.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	As per the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0), the mass flow of greenhouse gas *i* in the gaseous stream in time interval *t* (Fi,t) is calculated based on measurements of: a) the total volume flow or mass flow of the	~~CL 9~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			gas stream and b) the volumetric fraction of the gas in the gaseous stream and c) the water content and gas composition The tool covers possible measurement options, providing six different calculation options to determine the volume or mass flow of a particular greenhouse gas (A-F). Furthermore, the tool provides two options for the determination of the moisture content of the gaseous stream, while Option 2 (simplified calculation without measurement of the moisture content) is applied. This option provides a simple and conservative approach to determine the absolute humidity by assuming the gaseous stream is dry or saturated depending on which is the conservative situation. In order to follow a conservative approach for the determination of the project emissions the gaseous stream is assumed to have a moisture content of "0" and is therefore considered dry. As the gaseous stream is assumed to be dry Option A is chosen for the calculation of the mass flow of greenhouse gas *i* (Fi,t), which is calculated as per the requirements of the methodology. However, under the option A, when the flow measurement on a dry basis is not doable for a wet gaseous stream, it is necessary to demonstrate that the gaseous stream is dry to use		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				this option. There are two ways to do this: (a) Measure the moisture content of the gaseous stream (CH2O,t,db,n) and demonstrate that this is less or equal to 0.05 kg H2O/m3 dry gas; or (b) Demonstrate that the temperature of the gaseous stream (Tt) is less than 60ºC (333.15 K) at the flow measurement point. Since this has not been included in the monitoring plan, how this would be demonstrated that the gaseous stream is dry to use option A?		
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	Not all the parameters required by the methodology and the relevant tools described in the PDD version 01 dated 7 October 2011. This is pending to CL 9.	~~CL 9~~	OK
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	$P_{NA,n}$: Nitric acid produced in the monitoring period n ($tHNO_3$) will be continuously measured by a mass flow meter. Density & acid concentration will be determined by laboratory analysis. $T_{open,n}$: The current design of the project does not have any option of bypassing the EnviNOx system but in order to comply with the methodology requirements and also	OK	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			keeping in view the possibility of any future installation of a bypass, the parameter $T_{open,n}$ will be monitored continuously. $F_{N2O, tailgas,h:}$ Mass flow of N_2O in the gaseous stream of the tail gas in the hour h (kg N_2O/h). It will be measured by stack gas volume flow meter and N_2O analyzer. The parameter is not available for validation and will be monitored ex-post. h_n: Number of hours in monitoring period n during which the plant was in operation will be monitored from the production logs. $NCV_{i,j}$: Taken from IPCC default values at the upper limit of uncertainty at a 95% confidence interval as provided in table 1.2 of chapter 1 Vol. 2 (Energy) of the 2006 IPCC Guidelines in National GHG Inventories (50.4 GJ/ton) $EF_{CO2, i, y}$: Taken from IPCC default values at the upper limit of uncertainty at a 95% confidence interval as provided in table 1.4 of chapter 1 Vol. 2 (Energy) of the 2006 IPCC Guidelines in National GHG Inventories (0.0583 tCO_2/GJ) $PE_{CO2,tertiary,n}$: Project emissions related to fossil fuel input to the destruction facility		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				and/or re-heater in monitoring period n will be calculated using *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion, Version 02* /40/. For this purpose natural gas consumption by the destruction facility will be measured continuously. $V_{t,db:}$ Volumetric flow of the gaseous stream in time interval t on a dry basis (m3 dry gas/h). The parameter is not available for validation. Will be monitored ex-post. $v_{i,t,db:}$ Volumetric fraction of greenhouse gas i in a time interval t on a dry basis (m^3 gas i/m^3 dry gas). The parameter is not available for validation. Will be monitored ex-post. Temperature (T_t) & pressure (P_t) of gaseous stream will also be determined ex-post.		
B.7.4	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	Requirements for maintenance and calibration of the equipments measuring the following parameters have been detailed in the PDD: • $P_{NA,n}$: Maintenance and calibration of the flow meter and density meter will be applied as per the internal QA/QC procedures. DNV considers this to be acceptable. • $F_{N2O,\ tailgas,h}$: The monitoring system will be installed and maintained as per the European Norm 14181 (2004).	OK	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			QAL2 test will be conducted once every 5 years while AST will be conducted every year. DNV considers this calibration routine to be appropriate. • calibration routine to be appropriate • $V_{t,db}$: The flow meter will be subject to periodic calibration against a primary device provided by an independent accredited laboratory is mandatory. DNV considers this calibration routine to be appropriate. • $v_{i,t,db}$: N_2O gas analyzer will undergo regular span and zero checks. DNV considers this calibration routine to be appropriate. • T_t: Periodic calibration will be carried out against a primary device provided by an independent accredited laboratory. Also regular calibrations will be carried out as per vendor's specification. DNV considers this calibration routine to be appropriate. • P_t: Periodic calibration will be carried out against a primary device provided by an independent accredited laboratory. Pressure transdeucers will be calibrated monthly. DNV considers this calibration routine to be appropriate.		

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.7.5	Is the monitoring frequency adequate for all monitoring parameters?	/1/	DR	Yes	OK	OK
B.7.6	Is the recording frequency adequate for all monitoring parameters?	/1/	DR	Yes	OK	OK
	Ability of project participants to implement monitoring plan					
B.7.7	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/ /15/	DR	Yes. The project proponent is managing similar monitoring arrangements under the old plant that is a registered CDM project activity. Omnia is certified for the ISO 9000 Quality, ISO 14001 Environmental and OHSAS 18001 Occupational Health and Safety Management Systems by an international certification body. Omnia has integrated Management System to manage the old nitric acid plant and the existing CDM project at the old plant. This was verified by DNV during site visit by reviewing the content of the integrated management system that covers the existing CDM project. Omnia is currently going through re-certification of its Integrated Management System to ISO 9000 Quality, ISO 14001 and OHSAS 18001 that was verified by reviewing a letter from I-Cert dated 30 September 2011 /15/. DNV is of the opinion that the monitoring arrangements described in the monitoring plan are feasible within the project design for the new	OK	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				plant as well.		
B.7.8	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?			Yes. The procedures are identified in the PDD for day-to-day records handling including record keeping, storage of records and processing of performance documentation. Continuously monitored parameters will be measured at a recording frequency of 2 seconds while hourly averages of these parameters will be calculated automatically, which will then be used for calculation of emission reductions. A procedure has also been defined in the PDD for the treatment of any missing or corrupted data. This procedure ensures the most conservative approach for the calculation.	OK	
B.7.9	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR	Yes. The data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved from the project can be reported ex post and verified.	OK	OK
B.7.10	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	Yes. As per the PDD, all monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later.	OK	OK
	Monitoring of sustainable development indicators/ environmental impacts					
B.7.11	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	The sustainable development indicators /environmental impacts are covered in the LoA issuance process and are not required to be	OK	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				monitored by the project developer. This was confirmed during interviews with the DNA of the host country.		
B.7.12	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	N.A.	OK	OK
B.7.13	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	N.A.	OK	OK
C Duration of the project activity / crediting period						
C.1.1	**Start date of project activity (VVM para 99-100, 104)**					
C.1.2	How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/1/	DR	The start date defined in the PDD, version 01 dated 7 October 2011 is 30 June 2011. However, this needs to be changed to 20 July 2011 as discussed above under checklist questions B 5.5.	~~CAR 2~~	OK
C.1.3	Is the stated expected operational lifetime of the project activity reasonable?	/1/	DR	Yes. The new nitric acid plant has operational lifetime of at least 25 years and is not expected to be decommissioned before that time.	OK	OK
C.1.4	Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/	DR	The start date of the crediting period is 01 April 2012 or the day of the registration of the project at UNFCCC whichever occurs later. The project participants have chosen a fixed term crediting period of ten years.	OK	OK
D Environmental Impacts (VVM para 131-133 and VVM para 136 (d) for small-scale project activities, as applicable))						
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an	/1/ /16/	DR	As per the Government Gazette of 18 June 2010 /17/ Listing notice 2: List of activities and	OK	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	EIA approved? Does the approval contain any conditions that need monitoring?	/17/ /18/ /19/		competent authorities identified in terms of Section 24 (c) and 24 (d) of the National Environmental Management Act, 1988 (Act No. 107 of 1998) /16/, the commencement of new nitric acid plant including storage of its products require environmental authorization. Based on the Environmental Assessment report for the construction of a nitric acid and an ammonium nitrate plant for Omnia Fertilizer at Sasolburg dated 30 April 2010 /18/, the department of economic development, tourism, and environmental affairs, Free State Province, South Africa issued an environmental authorization on 10 June 2010 for the new nitric acid plant /19/.		
D.1.2	Does the project comply with environmental legislation in the host country?	/1/	DR	Yes. The project complies with the environmental legislation in the host country as stated above in D.1.1. It should be noted that the proposed project activity (N2O abatement itself) does not require environmental authorization as confirmed from the Government Gazette of 18 June 2010.	OK	OK
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	The proposed project activity (N_2O abatement) does not create any adverse environmental effects.	OK	OK
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	N.A.	N.A.	N.A.
D.1.5	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	N.A.	N.A.	N.A.
D.1.6	Are transboundary environmental impacts considered in the			N.A.	N.A.	N.A.

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	analysis?					
E	**Stakeholder Comments (VVM para 128-130)**					
E.1.1	Have relevant stakeholders been consulted?	/1/ /20/ /21/ /22/ /23/	DR	Yes. On 30 September 2011 a local stakeholder meeting took place at the Premises of Omnia. The meeting was attended by three stakeholders. One stakeholder sent an apology for not being able to attend. One of the attendees was from the local government and two of the attendees were from local industry. A presentation was made to them on the details of the project. Positive feedback was received from each of the stakeholders, with no concerns raised. DNV has confirmed this by reviewing the attendance register dated 30 September 2011/20/, the open day presentation /21/, the copy of the responses to the questions received from the local stakeholder /22/, and the minutes of the meeting for the local stakeholder consultation /23/.	OK	OK
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/ /24/	DR	Stakeholders were invited for comments and for participation at the local stakeholder consultation by publishing public notices in the local newspapers from 12 to 16 September 2011. DNV has reviewed the newspaper clip dated 12 September 2011 /24/ during the site visit and confirms that appropriate media was used for the local stakeholder consultation process.	OK	OK
E.1.3	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder	/1/	DR	The stakeholder consultation is required for EIA as confirmed during DNA interviews and it has	OK	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	consultation process been carried out in accordance with such regulations/laws?			been done as per the host country requirements.		
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	Yes. DNV has received and reviewed summary of stakeholder's comments.	OK	OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	No major comments were received except requesting copy of the presentation given on the open day of the stakeholder consultation, sharing the project idea with other companies in the region, and Omnia's role in COP 17. DNV is of the opinion that due accounts have been taken of all stakeholder comments received.	OK	OK

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 1 LoAs: It has been confirmed from the DNA of South Africa that a draft validation report will be needed for processing the LoA application. The project proponent has also stated that the DNA of United Kingdom of Great Britain and Northern Ireland also requires a draft validation report for processing the LoA application. DNV will issue a draft validation report when all other open issues listed in this Table 3 are adequately addressed by the project proponent and closed by DNV. However, DNV cannot proceed with submission of the request for registration to UNFCCC until LoAs from DNA of South Africa and DNA of United Kingdom of Great Britain and Northern Ireland are received.	A.3.2 A.3.3	The PP applied for the host country LoA from South Africa upon issuance of the draft validation report by DNV. Regarding the Annex 1 country LoA, the PP decided to apply for registration of the CDM project activity without an Annex 1 country being involved. The PDD was updated accordingly. A letter of approval form the DNA of South Africa dated 1 March 2012 is provided to DNV.	Upon closing all other CARs and CLs, DNV proceeded towards issuing a Draft validation report dated 20 December 2011 that was required for starting the LoA issuance processes. This final validation report is issued upon receiving a letter of approval (LoA) /36/ for the project that was issued by the DNA of South Africa on 1 March 2012 authorizing Omnia Fertilizer, Division of Omnia Group (Pty) Ltd. of the host Party as project participant and confirming that the project assists in achieving sustainable development. The project participant has decided to apply for registration of the CDM project activity without the involvement of an Annex 1 country and thus the Annex I part has been removed from the updated PDD version 02 dated 12 April 2012. CAR 1 is closed.
CAR 2 CDM Project Start Date: DNV is of the opinion that the start date as per UNFCCC guidelines should be the earliest date at which either the implementation or construction or real action of a project activity begins. The date	B.5.5 B.5.10 C.1.2	The respective PDD section was revised to represent the date of the acceptance of the change order for the N_2O abatement system as the new project start date (20 July 2011).	The project start date has been updated to 20 July 2011 in section C.1.1 of the revised PDD (version 02 dated 12 April 2012) /1/. DNV has reviewed the Uhde GmbH Change Order No. 3 for the EnviNOx

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
on which the project team was communicated to go ahead with the project (30 June 2011) does not represent the date on which either the implementation or construction or real action of a project activity begins.			upgrade system of 18 July 2011 /2/ and the acceptance email by Omnia dated 20 July 2011 of Uhde GmbH change order /4/ for the EnviNOx upgrade. DNV confirms the start date of the project based on acceptance of the change order for the EnviNOx upgrade (i.e. 20 July 2011). CAR 2 is closed.
CAR 3 Project Emission Calculation: In the emission reductions calculation sheet *ER_Calculation_Omnia_v2.xlsx* /3/ the parameter $FC_{i,j,y}$ under the $PE_{CO2,tertiary,n}$ tab has been wrongly calculated. This needs to be corrected.	B.6.5 B.6.11	In the project emissions calculation, the parameter $FC_{i,j,y}$ was wrongly calculated by directly multiplying the total CH_4 consumption from the destruction facility with the GWP of CH_4 (this is not correct since the CH_4 is not emitted but is oxidized to CO_2). A correction was made in the calculation and the revised ER calculation was provided to DNV. Moreover, option A instead of option B was used in order to calculate $COEF_{i,y}$ as per *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion.* The same option will be used for ex-post determination of $COEF_{i,y}$.	DNV checked the revised calculation sheet *ER_Calculation_Omnia_v5_d.xlsx.* /3/. It is confirmed that the revised calculation have been correctly executed as per the methodology and the CO_2 emission factor $COEF_{i,y}$ was calculated as per *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion*/40/. Sections B.6.1, B.6.2 and B.7.1 of the PDD were updated accordingly. CAR 3 is closed.
CL 1 The new plant is designed by Uhde GmbH with a design production capacity of 350 000 tonnes 100% concentrated nitric acid per year as confirmed from the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July	A.2.6	The final design of the nitric acid plant resulted in the higher expected capacity of the plant as 400 000 tonnes of 100% concentrated nitric acid per year. A confirmation for this design capacity was obtained from the technology supplier	A letter obtained from the technology supplier (Uhde GmbH) /25/ was provided to DNV. The said letter states, "The new nitric acid plant of Omnia has an expected yearly capacity of 400 000 tons of nitric acid (100%)". The methodology doesn't put

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
2011 /2/. In addition, the original plant design document needs to be provided to DNV. It should also be noted that the Change Order No. 3 for the EnviNOx mentions a nitric acid plant design capacity of 1000 mtpd nitric acid 100% at an operating time of 350 days per year. Thus, the total nameplate capacity of the plant is 350 000 tonnes of 100% concentrated nitric acid per year. While the PDD Version 01 dated 7 October 2011 calculates emission reductions at 400 000 tonnes of 100% concentrated nitric acid per year. This needs to be clarified. In addition, the PDD mentions an abatement efficiency of 99.9%. It has been stated during the site visit audit that the emission reductions are based on an abatement efficiency of 99.5%. However, the Change Order No. 3 for the EnviNOx /2/ mentions a minimum warranted performance of 94% initially and 90% in the 36 months warranty period. This needs to be clarified as well what forms the basis for the abatement efficiency of 99.5% and if needed corresponding corrections to the PDD and the ER calculations need to be made and provided to DNV.		(Uhde GmbH) and was provided to the DOE. The guarantee values for the abatement efficiency in the contract with the technology supplier are by nature well below the expected values. Therefore the calculation of estimated emission reductions was revised to be based on the minimum expected value of 98 % as stated in the offer from the technology provider. While the calculations are revised on this basis it should be noted that from experience from Omnia´s first N_2O reduction project as well as from other similar projects with the same technology even higher abatement efficiencies of up to 99.9 % were observed.	a cap on the annual Nitric acid production. Thus the clarification provided by the PP is deemed sufficient. Although the Change order no.3 for EnviNOx upgrade system /2/ mentions a minimum warranted performance of 94% initially and 90% in the 36 months warranty period but Uhde's initial proposal for the EnviNOx upgrade system /11/ dated 30 June 2011 stated the minimum N_2O reduction efficiency of the system to be 98%. DNV also agrees with the opinion of PP that the tertiary abatement systems (like EnviNOx) can have efficiencies as high as 99.9%. However, based on the arguments, the use of 98% abatement efficiency towards calculation of ex-ante emission reductions is considered reasonable and is thus acceptable. DNV has also verified that the recalculation of emission reductions in the excel spread sheet /3/ is correctly based on the 98% abatement efficiency. The PDD version 02 of 25 November 2011 /1/ was verified to have been updated accordingly. CL 1 is closed.
CL 2 <u>Project Funding:</u> DNV has reviewed the ''Board Paper for the Development of a Carbon Development	A.5.1	The transcript of the board meeting referring to the approval for the investment was provided to DNV. It should also be noted that the document makes reference to	The board of directors of Omnia Holdings Limited gave approval of the EnviNOx project during the 140th meeting held on 28 July 2011. A copy of minutes of meeting

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
Mechanism Project on the New Nitric acid plant'' dated 14 July 2011/5/ and confirmed the additional project costs associated with the installation of EnviNOx system. However, the board's approval for the same amount for the EnviNOx system needs to be provided.		the fact that it was not budgeted for when the original project was approved.	from the said session /26/ was reviewed and verified by DNV. The document also states explicitly that "The capital was not part of the original plant capital approved and thus it is a change in scope". CL 2 is closed.
CL 3 <u>Integrated Air Quality Permit:</u> DNV was provided with the registration certificate of 26 April 1984 for the Old nitric acid plant that was issued under the atmospheric Pollution Prevention Act of 1965 for the old nitric acid plant. When DNV inquired about the provisional atmospheric emission licence and atmospheric emission licence as per the requirements of National Environmental Management: Air Quality Act 39 of 2004 for the new plant, it was stated that the permit application for the integrated Air Quality Permit for both the old and the new plant has been submitted with the authorities but the chances are that the permits would not be issued by the end of year 2012. DNV was also provided with the confirmation of submission for the transitional licence application dated 20 September 2011 /9/. However, the copy of the applications itself was not provided to DNV. The copy of the application for the transitional licence needs to be provided to DNV. In addition, since the plant is expected to be commissioned before the integrated emission	B.2.4 B.2.5 B.4.1 B.4.4 B.4.6 B.4.7 B.4.8 B.5.1 B.5.2 B.5.3	A copy of the transitional licence application was provided in the most updated version of 21 November 2011. The initial application was handed in to the national authorities in 2009. However due to some change of responsibilities to the municipalities the case is still not finalized. The responsibility for the management of air quality was delegated to the regional municipalities by the national government. Fezile Dabe is the regional municipality for the Sasolburg area. The Fezil Dabi District municipality issued a letter on 10 November 2011 where it is confirmed that the commissioning of the plant is authorised on the basis of the license application. The municipality states that they give permission for the commissioning of the plant, even though we do not yet have an approved license. This is due to the fact that there is a time constraint. The letter from the Fezil Dabi District municipality was provided to DNV.	A copy of the transition license application /27/ was provided & was reviewed by DNV. In addition, a letter from the regional municipality of Sasolburg; Fezile Dabi district municipality (which is, according to the section 36(1) of the Air Quality Act no. 39 of 2004 /6/, responsible for granting licences for the listed activities /7/ in its own region) was also provided /28/. DNV confirms that the letter from Fezile Dabi, dated 10 November 2011, acknowledges the receipt of an application from Omnia for an Atmospheric Emission License (AEL) and for conversion of Atmospheric Pollution Prevention Act (APPA) registration certificates to one consolidated Atmospheric Emission License. It was also verified by DNV that the Fezile Dabi District Municipality granted permission to Omnia to start commissioning the plant while their application is still pending with the municipality for processing. Since Omnia already has the registration certificate for the old Nitric acid plant (from

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
license is issued; further clarification is needed with regards to commissioning the new plant without having the integrated Air Quality Permit from the authorities. Furthermore, the relevant national and/or sectoral policies and circumstances are not listed in the PDD. The discussion related to national and/or sectoral policies and circumstances needs to be included in section B.4 of the PDD.		Respective clarifications are included in section B.4 of the PDD. A confirmation letter issued by Department of Environmental Affairs of the government of South Africa confirms the absence of N_2O regulations for nitric acid plants in South Africa.	1984) & also since N_2O is not included in the list of activities /7/ to be regulated under Air Quality Act no. 39 of 2004 /6/, the evidences provided by PP in the form of: 1. Transition license application /27/ 2. Letter from Fezile Dabi district municipality /28/ 3. Letter of no existing regulations in South Africa with regards to N_2O emissions (from the Department of Environmental Affairs, Govt. of South Africa /8/) are deemed sufficient to close this clarification request. It was also verified that the section B.4 of the PDD was updated accordingly. CL 3 is closed.
CL 4 <u>Prior Consideration of CDM:</u> It has been stated that the Omnia board of directors approved the proposed project from DeNOx to EnviNOx (for abatement of NOx and N2O) on 28 July 2011. An email from the CEO of company (Omnia) to the general manager production confirming this was shown to DNV during site visit. However PDF of the email needs to be provided to DNV. It was stated during the site visit that the start date of 30 June 2011 in the PDD version 01 of 7	B.5.5 B.5.10	The requested email regarding the board approval for the financing of the project was provided to DNV. The email regarding the internal decision to go ahead with the project was provided to DNV. There is no additional proof regarding the approval by the Omnia board prior to the official board meeting. The issue here is why the change order was accepted, effectively committing to the project while	A copy of the e-mail from CEO (Omnia) to the GM production (Omnia) dated 28 July 2011 has been provided. A copy of internal decision to go ahead with the project has also been provided. It was also stated that it is within CEO's mandate to take decisions on issues like this without getting prior approval from the board of directors. Other evidences including the internal (within Omnia) & external (with Uhde GmbH) communication for the updation of design of the Nitric acid plant (to include

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
October 2011 is based on the date on which it was communicated to the responsible project team to go ahead with the project. An email was shown to DNV that was sent to the project responsible team by the general manager production. A PDF copy of that email also needs to be provided to DNV. It was also stated that even though the board of director approved the EnviNOx upgrade ten days later i.e. on 28 July 2011, the CEO of the company had verbally agreed with the board of directors on 18 July 2011 based on the Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011/4/ and the ‘‘Board Paper for the Development of a Carbon Development Mechanism Project on the New Nitric acid plant’’ dated 14 July 2011/5/ and asked the general manager production to accept the change order for the EnviNOx upgrade. If possible any evidences for the events need to be provided.		not having final approval by the board. This was done specifically as a change order on the original contract for the Nitric Acid plant, since the original contract has a cancellation clause in it. The same approach was followed to save time on the initial project. It was decided to get the process started as soon as possible, while knowing that if the board does not approve the capital, then Omnia would be liable to pay a percentage of the cost, but not all. It is within the CEO's mandate to make this decision.	EnviNOx) were also made available & were verified by DNV. Based on all the above evidences DNV can confirm the prior consideration of CDM for the project. CL 4 is closed.
CL 5 <u>The Prior Consideration Notices:</u> The prior consideration notices to South African DNA dated 07 September 2011 and to UNFCCC dated 07 September 2011 are within six months of the project revised start date (refer to CAR 2). However, the copy of the notices need to be provided to DNV.	B.5.6 B.5.10	The email containing the prior consideration notice to UNFCCC and the DNA of South Africa was provided to DNV	The prior consideration notices submitted to UNFCCC on 7 September 2011 /29/ and to South African DNA on 7 September 2011 /30/ were provided and verified by DNV. CL 5 is closed.
CL 6 <u>Continuous Efforts to Secure CDM Status:</u>	B.5.7 B.5.10	A copy of the CDM project consultancy contract was provided to DNV.	A copy of the contract between Omnia Fertilizer and N.serve Environmental

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
The following initiatives were taken by the project participants from the start date (of 20 July 2011) to the start of validation (13 October 2011): - A validation contract was signed with DNV on 10 October 2011. Furthermore, a copy of the contract signed with the project consultant needs to be provided. In addition, evidences of any other initiatives that were taken by the project participants from the start date (of 20 July 2011) to the start of validation (13 October 2011) needs to be provided to DNV.		Several actions and communication took place in the mentioned period as additional evidence one email from N.serve to Omnia regarding the LSC process was provided to DNV.	Services GmbH (consultants for the project) dated 31 August 2011 /31/ was provided and verified by DNV. Moreover, e-mail communication dated 6 September 2011 between Omnia and N.serve for holding local stakeholder consultation was provided and verified by DNV /32/. Furthermore, Omnia signed contract with DNV on 10 October 2011 to conduct validation of the project. These evidences are deemed sufficient by DNV to demonstrate that continuous efforts were made by the project proponent to secure CDM status. CL 6 is closed.
CL 7 <u>Start of Construction:</u> DNV has also reviewed the Uhde GmbH Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/ and the acceptance email by Omnia dated 20 July 2011 of Uhde GmbH change order /4/ for the EnviNOx upgrade as mentioned earlier. However, it needs to be clarified when the construction of the project activity itself started. In this regard DNV also needs copies of the contracts (procurement and construction) that were signed for the new nitric acid plant including the DeNOx unit.	B.5.8 B.5.10	Copies of the contracts for procurement and construction of the nitric acid plant were provided to DNV.	Copies of contracts between BME (Pty) Ltd. and Uhde GmbH (for basic engineering of the project) /33/ and contract between Omnia and Uhde GmbH (for detailed engineering & services) /34/ were verified by DNV. It was verified that the original design of the plant included the installation of only DeNOx unit and it was only later that the scope of the project was extended (to include the installation of EnviNOx unit) through Change Order No. 3 for the EnviNOx upgrade system of 18 July 2011 /2/. By the time of site visit (on 2-3 November 2011) no construction of the EnviNOx system had taken place except for the catalytic reactor vessel (which, according to the original design, was to

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			serve as a DeNOx reactor but after the acceptance of Change Order No. 3 /2/ was modified to make it a part of the EnviNOx unit). CL 7 is closed.
CL 8 <u>Calculations of GHG Emission Reductions:</u> The GHG emission reduction calculations are documented in the PDD and also the calculation spreadsheet was reviewed by DNV during the on-site visit. The updated calculation spreadsheet as per the relevant CARs and CL need to be provided to DNV.	B.6.2 B.6.3 B.6.4 B.6.5 B.6.6 B.6.7 B.6.11	The updated EXCEL spreadsheet was provided to DNV. See also CL1 regarding this issue.	The updated Excel sheet /3/, (revised in response to CL 1) was provided. The baseline emissions BE_n have been estimated by using the default emission factor $EF_{default,y}$ as per the methodology. Meanwhile, due to the unavailability of any real time data (at the time of validation) for the total volume flow of tail gas ($V_{t,db}$) & the volumetric fraction of the gas in the gaseous stream ($V_{i,t,db}$), project emissions $PE_{N2O,n}$ have been estimated by using a 'business as usual emission factor' of 6.45 $kgN_2O/tHNO_3$. The value is an average of the baseline emission factors from the first five monitoring periods of Omnia's existing N_2O abatement project at the old Nitric acid plant (which is also a registered CDM project activity). Since both nitric acid plants (old and the new one) employ the same technology & design (by Uhde GmbH) and also since the ex-post emission reductions will be based on the actual project emission calculated by measuring the real time tail gas flow and gas fraction (to be measured after the installation of AMS), use of the baseline emission

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			factor from the existing plant for estimating the ex-ante project emissions is deemed reasonable and acceptable by DNV. DNV confirms that the calculations have been correctly executed (& updated) as per the approved methodology /39/ and the tools referred therein /40/ /41/. CL 8 is closed.
CL 9 <u>Data and Parameters Monitored:</u> As per the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0), 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 and b) the volumetric fraction of the gas in the gaseous stream and c) the water content and gas composition The tool covers possible measurement options, providing six different calculation options to determine the volume or mass flow of a particular greenhouse gas (A-F). Furthermore, the tool provides two options for the determination of the moisture content of the gaseous stream, while Option 2 (simplified calculation without measurement of the moisture	B.7.1 B.7.2	The monitoring parameters in the PDD have been updated according to the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0) option A. As the gaseous stream is assumed to be dry, Option A is applied. In order to apply this option, it shall be demonstrated that the gaseous stream is dry. As described in part (a) of Option A, the moisture content of the gaseous stream (CH_2O,t,db,n) will be measured and it shall be demonstrated that it is less or equal to 0.05 kg H_2O/m^3. The moisture measurement shall coincide with the Annual Surveillance Test (AST) or the calibration of the flow meter for the gaseous stream. A statement from the technology provider (Uhde) was provided that confirms that the expected moisture content will be well	A confirmation e-mail /35/ from Uhde GmbH (the technology supplier) was provided to DNV, which states that the normal moisture content in the tail gas is 0.0048 kgH_2O/Nm^3 of dry tail gas (at 1.013 bar, 0^oC) with a maximum value of 0.0066 kgH_2O/Nm^3 of dry tail gas (at 1.013 bar & 0^oC). These figures are much below the threshold moisture content of 0.05 kgH_2O/Nm^3 of dry tail gas (as stated in the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0) option A) /41/. The PP has also committed to measure the actual moisture content of the tail gas during every AST or the calibration of the tail gas flow meter. This will provide an yearly assessment on the actual moisture content of the tail gas. In addition, a parameter for the moisture content of the gaseous stream at normal conditions, in time interval t ($C_{H2O,t,db,n}$)has been added to the

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
content) is applied. This option provides a simple and conservative approach to determine the absolute humidity by assuming the gaseous stream is dry or saturated depending on which is the conservative situation. In order to follow a conservative approach for the determination of the project emissions the gaseous stream is assumed to have a moisture content of "0" and is therefore considered dry. As the gaseous stream is assumed to be dry Option A is chosen for the calculation of the mass flow of greenhouse gas *i* ($F_{i,t}$), which is calculated as per the requirements of the methodology. However, under the option A, when the flow measurement on a dry basis is not doable for a wet gaseous stream, it is necessary to demonstrate that the gaseous stream is dry to use this option. There are two ways to do this: (a) Measure the moisture content of the gaseous stream (CH_2O,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 (Tt) is less than 60ºC (333.15 K) at the flow measurement point. Since this has not been included in the monitoring plan, the PP is requested to clarify how it will be		below the threshold value mentioned in the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0) option A.	monitoring plan. As demonstrated by the confirmation e-mail from Uhde GmbH /35/ and based on the fact that it will be monitored at every AST or QAL2, DNV is of the opinion that the gas stream could be considered dry and thus it is OK to use option A of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream". CL 9 is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
demonstrated that the gaseous stream is dry in order to use option A.			

Table 4

Forward action requests

Forward action request	Reference to Table 2	Response by project participants
	-	-

No FAR has been issued.

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Rafi-ud-Din Khawaja

Rafi-ud-Din Khawaja holds a Master's Degree in Environmental Engineering with over 8 years of experience in air pollution control technology, air pollution monitoring, risk management reviews (RMR), ambient air quality analysis (AAQA), transport phenomena, urban and industrial air quality management .

He has acquired over three years of experience in validation and verification of numerous CDM and JI projects while working in DNV. He has been qualified as a CDM validator for technical area Renewables (hydro) and as a CDM validator/verifier as well as a Technical Reviewer (TR) for technical area N2O under the Qualification Scheme of Climate Change Services of DNV.

His qualification, industrial experience and experience in CDM facilitate him to assess all technical areas to sufficient degree.

Fahad Saleem

Fahad Saleem holds a Master Degree in Chemical Engineering. He has an overall experience of 3.5 years. Prior to joining DNV, he has 3 years' experience in Fertilizer industry covering plant operation.

He has an experience of around 6 months in validation and verification of CDM/JI projects and other 3rd party validation/verification services.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in TA 5.1/11.1/12.1.

Trine Kopperud

Trine Kopperud holds a Bachelor First Honours Degree in Chemical and Process Engineering with an overall experience of around_25 years in chemical process industries. Prior to joining DNV she has gained experience from fertiliser production (including ammonia, nitric acid and catalysts production and sales), magnesium production and energy efficiency. Positions in research and operations including 5 year experience in N_2O abatement technologies (research & development, operation, application and sales).

She has experience of 5 years in validation and verification of CDM projects/JI in several countries including China, India, Africa, Middle East and Eastern Europe.

Her qualification, industrial experience and experience in CDM/JI demonstrate her sufficient sectoral competence in Chemical Processes Industries TA 5.1/11.1/12.1. and Metal production TA 9.1.