

## **Consolidated information on postponement application and responses to technical clarifications: Sasol Nitro, Ekandustria**

The information provided below underpins the information already provided and summarised elsewhere in documents pertaining to the postponement application, including the final motivation report, the final Atmospheric Impact Report and the final Comment and Response Report.

This document contains two sections:

- A. Responses to technical clarifications on aspects of the application, linked to information contained in the postponement application;
- B. A table of consolidated information pertaining to the applications as extracted from the application documentation, along with references to the applicable emission source in the Atmospheric Emissions Licence and 2014 compliance report, which also contextualises the requested alternative emissions limit for the applicable point source

### **A. Responses to technical clarification questions**

#### **1. Can Sasol Nitro provide additional information on the compliance roadmaps and projects and timelines?**

The information requested is summarised in Chapter 7 of the motivation report based on the detailed information presented in Chapter 4 of the final motivation report for postponement.

It is also briefly summarised below.

| Summary of steps to attain compliance at MMAN plant                                            | '05 | '06 | '07 | '08 | '09 | '10 | '11 | '12 | '13 | '14 | '15 | '16 | '17 | '18 | '19 | '20 |
|------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Implementation of process modifications to reduce MMA emissions, following promulgation of MES |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Implementation of heat exchanger condenser system to scrubber                                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Measurement to confirm compliance under all normal operating conditions                        |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Implementation of downstream measures to manage cross-media impacts, if required               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**Figure 1: Roadmap to compliance for Sasol Nitro as portrayed in Chapter 7 of the final motivation report (note: this is a condensed diagram, the motivation report contains a larger version)**

The existing and new plant standard for methylamines of 10 mg/Nm<sup>3</sup> can already be achieved with the condenser system in operation, which was implemented over the period 2012 – 2014 (referenced in the Ekandustria compliance report FY14, in Table 4.1.1 pg 10). When this condenser system is in operation, it generates an effluent treated by the current water treatment facility. As described in Chapter 4 of the motivation report, during the postponement period requested, it is possible that the current water treatment facility will reach capacity and will not be able to accept the additional effluent from the condenser. This condition is expected to occur only under high rainfall conditions. A higher emission limit is therefore required under these specific circumstances, which also constitute normal operating conditions.

The higher limit is necessary to ensure that compliance can be achieved under all normal operating conditions, including high rainfall conditions.

Subject to further measurement and completion of installation of the new water treatment facility by 2020, compliance with the MES will be achieved under all normal operating conditions.

**Based on an assumption that heavy rainfall days will not exceed 18 days per year, it is reasonably expected that the Mono-methylamine nitrate plant will comply with the standard of 10 mg/Nm<sup>3</sup> for 95% of the time during normal operating conditions. For the remaining 5% of normal operating conditions, the emissions will not exceed the requested alternative emission limit of 100 mg/Nm<sup>3</sup>. Shut down, start up and upset conditions are excluded.**

#### **2. How did Sasol Nitro derive the proposed alternative emission limits?**

An explanation of how the alternative emission limit was derived is provided in the explanatory footnote to the table in Section B below.

**Based on an assumption that heavy rainfall days will not exceed 18 days per year, it is reasonably expected that the Mono-methylamine nitrate plant will comply with the standard of 10 mg/Nm<sup>3</sup> for 95% of the time during normal operating conditions. For the remaining 5% of normal operating conditions, the emissions will not exceed the requested alternative emission limit of 100 mg/Nm<sup>3</sup>. Shut down, start up and upset conditions are excluded.**

**B. Table of consolidated information for Sasol Nitro as extracted from postponement application, and as referenced in AEL and compliance report**

| Details of applicant | Listed activities seeking postponement |                                                               | Description of activity | Applicable MES, and requested alternative emissions limits and arrangements | Technical detail on application | Assessment of impacts on postponement for ambient air quality: Atmospheric Impact Report |                                              |                                                                                           |                                                                                                        |                                      | References to AEL and 2014 annual emissions report and explanation of how the proposed alternative emission limit was derived |                                                                                                                                                                                                                                                                              |                                                           | Other relevant references in application                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------|---------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | MES Category                           | Name of process plant                                         |                         |                                                                             |                                 | Pollutant                                                                                | Point source parameters - AIR Table 4.1 pg 7 | Emission rates - AIR Table 4.2 pg 7 (baseline) and Table 5.2 pg 21 (compliance scenarios) | Start up, shut down and upset conditions                                                               | Impacts: isopleths - AIR Section 5.1 | Reference to point source information in AEL                                                                                  | Reference to point source information in compliance reports                                                                                                                                                                                                                  | Explanation of how alternative emission limit was derived |                                                                                                                                                                                                                                                                                 |
| Sasol Nitro          | 6                                      | Mono-methylamine nitrate (MMAN) plant                         | Chapter 2, pg 2-3       | Chapter 6, pg 13                                                            | Chapter 4, pg 6-8               | MMA                                                                                      | Point source no. 1, MMA stack                | Table 4.2 - Point source no. 1, MMA stack                                                 | Table 4.3 pg 8 reflects a worst case scenario if none of the implemented emission controls are working | Section 5.1.8, pg 21-23              | Point Source Code 1 in Table 6.4.1. provides point source information.                                                        | Table 4.1.1 – MMA Stack Page 10 of 12 of compliance report dated 2 September 2014. The compliance report indicates compliance with the point source standard. Compliance measurements were conducted under normal operating conditions, with all emission controls in place. | *                                                         | Since a national ambient air quality standard has not been specified for MMA, a toxicological review for MMA was commissioned to identify screening levels for this non-criteria pollutant. This report was made publically available as part of the application documentation. |
|                      |                                        | Methylamines (Mono-methylamine or MMA, in Sasol Nitro's case) |                         |                                                                             |                                 |                                                                                          |                                              | Table 5.2 – Main stack                                                                    |                                                                                                        |                                      |                                                                                                                               |                                                                                                                                                                                                                                                                              |                                                           |                                                                                                                                                                                                                                                                                 |

\* On promulgation of the 2010 MES, MMA measurements were conducted at the MMA stack, which had not been previously measured. The initial measurement indicated an MMA concentration of 4,020 mg/Nm<sup>3</sup>, as indicated in Table 4.3. of the AIR, based on an independent measurement reported in November 2011. This value is seen as indicative of worst case conditions with no emission or process controls in place and the ambient impact of this worst case scenario is presented as Scenario 1b in Section 5.1.8.2. of the AIR. As indicated in Section 4.1 of the motivation report, following the measurement of the stack, various process controls were implemented in order to manage MMA emissions. The aim of these process controls was to ensure a more complete reaction between the MMA and Nitric Acid, which would increase the percentage of MMA reacted and converted into product, thereby reducing the amount of unreacted MMA that can exit the stack. These interventions have reduced the concentration of MMA in the stack, due to increased production efficiencies. Due to insufficient measurements available under these process conditions, it is not possible to provide a definitive emission concentration at these conditions. However, based on the expected process efficiency, expected scrubber efficiency and the technical knowledge of the plant operation staff, it is expected that a concentration of 100 mg/Nm<sup>3</sup> could be achievable in this scenario.

Subsequent to the above described process control improvements, a condenser system was installed to further reduce the emissions and ensure compliance with the MMA MES of 10 mg/Nm<sup>3</sup>. As indicated in the annual emissions report dated 2 September 2014, the MES is achievable when process controls controlling the process efficiency, as well as the condenser system, are operational. The scenario where the condenser system is offline due to heavy rain periods, would reflect a situation where all process controls are still in place, and hence would align with an expected emission performance of a maximum of 100 mg/Nm<sup>3</sup>.

As indicated in Section 4.1 of the motivation report, although the condenser system ensures compliance with the MES, it produces an effluent stream that is currently routed to the existing water treatment facility. To ensure that the water system can handle the additional effluent, upgrades to the system are required. Section 4.2 and 4.3 of the motivation reports outlines the reasons for the postponement request.