

# Wyeth

**Wyeth Nutritionals Ireland**

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Ireland  
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Office of Environmental Enforcement  
South/South West Region  
EPA  
Inniscarra  
Co. Cork

IPPC Licence Reg. No.: P0395-02

Date: April 24, 2007

Dear Ms. Berney,

Referring to the letter sent by your Ms. Ann Marie Donlon dated 28 March 2007 requesting additional information in relation to the above subject, please find the requested additional information below.

**1. Give the maximum ground level concentration for NO<sub>x</sub> (annual average) and compare with air quality standard for the protection of vegetation. Having regard to other industrial sources in the area, give background levels for NO<sub>2</sub> and NO<sub>x</sub>. Confirm that 100% conversion for long-term average was assumed for both scenarios.**

This is a three-part question, which is logically answered in reverse order:

**Conversion Rate**

100% conversion of NO to NO<sub>2</sub> was assumed as a worst-case scenario for the long-term averages quoted in the report.

**Background NO<sub>2</sub> and NO<sub>x</sub> levels.**

Limited air quality monitoring data are available for the Askeaton area for NO<sub>2</sub>. NO<sub>2</sub> monitoring was carried out at the Wyeth site for a twelve-week period between February and April 2004. Monitoring was carried out at ten different locations on the site and at the site boundary. The overall mean concentration for all locations over the ten week period was 8.2 µg/m<sup>3</sup>, with a minimum and maximum weekly average concentration at any of the sampling locations of 1.2 µg/m<sup>3</sup> and 24.6 µg/m<sup>3</sup>, respectively. It is likely that emissions from the site itself had some impact on the measured concentrations, hence the recorded concentrations cannot be considered to be fully representative of background concentrations adjacent to the site (i.e. without any influence from site emissions). Nonetheless the overall annual average value of 8.2 µg/m<sup>3</sup> is taken as being representative of **worst-case** long-term background NO<sub>2</sub> concentrations in the vicinity of the site.

There is no NO<sub>x</sub> data available for the site.

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### **Air Quality Standard for the Protection of Vegetation**

The air quality standard for the protection of vegetation in SI 271 for NO<sub>x</sub> (expressed as NO<sub>2</sub>) is 30 µg/m<sup>3</sup>. URS understands that this limit value may not be applicable in close proximity to large industrial sources. However, in the table below the long-term averages derived for NO<sub>2</sub> (assuming 100% conversion of NO<sub>x</sub>) for both scenarios modelled are added to the assumed worst-case background levels and compared to the 30 µg/m<sup>3</sup> limit value

### **Long-term NO<sub>2</sub> Air Quality Impact (including background)**

	Long-term average µg/m <sup>3</sup>	Assumed background conc. µg/m <sup>3</sup>	Worst-case conc. µg/m <sup>3</sup>	SI 271 standard for protection of vegetation µg/m <sup>3</sup>
Scenario 1	6.7	8.2	14.9	30
Scenario 2	10	8.2	18.2	30

### **2. Justify the proposed emission limit value for nitrogen oxides for the boilers in light of the burner manufacturer comments.**

The manufacturer specified the lowest NO<sub>2</sub> emissions levels that are possible to achieve with the burner under ideal conditions and steady load.

The limit values proposed provide the operational flexibility required to run the boilers without the possibility of a breach of the limit value. The air dispersion modelling has demonstrated that, even under worst-case conditions, a limit value of 300 mg/Nm<sup>3</sup> does not have a significant impact on local air quality. Although not directly applicable, it is noted that 300 mg/Nm<sup>3</sup> limit value is identical to the limit value specified for gas-fired large combustion plants (< 500 MWth) in Directive 2001/80/EC.

### **3. Provide the calculation for proposed emission limit value for sulphur dioxide (155 mg/Nm<sup>3</sup>) for the CHP**

The proposed limit value of 155 mg/Nm<sup>3</sup> for SO<sub>2</sub> for the CHP is provided by the CHP plant manufacturer as a performance guarantee when using Class D gas oil. This value is multiplied by the maximum flue gas flow rate of 61,420 Nm<sup>3</sup>/hr to give the mass-flow of SO<sub>2</sub> used in the model, i.e.  $155 * 61,420 / 3600 / 1000 = 2.6$  g/s.

However, when calculated from fuel oil data, Class D oil will result in a maximum SO<sub>2</sub> content of approximately 340 mg/Nm<sup>3</sup> dry gas at 3 % oxygen (licence limit for gas oil use in the boilers). When adjusted to the CHP reporting reference concentration of 15 % oxygen – the actual expected concentration in the flue gas is approximately 114 mg/Nm<sup>3</sup>. Hence the dispersion modelling overestimates the ground level SO<sub>2</sub> concentration.

**4. Demonstrate that 2003 meteorological data provides for the 'worst case' scenario**

URS has completed a range of air dispersion modelling scenarios (fuel type and operational mode) for Wyeth Askeaton. These models were run using data for 2001, 2002 and 2003. The data for 2003 was chosen for the submitted report as this data set resulted in the highest short-term averages (1 hour values for NO<sub>2</sub>) and was representative for all other data generated.

**5. Provide a summary of monitoring data for the CHP and boilers when fired on both gas and gas oil.**

A summary of monitoring data along with their respective ELVs for both the CHP Plant and the boilers when using natural gas in the table below.

Boilers and CHP Plant							
Emission Point	NOx Emissions (mg/Nm <sup>3</sup> )						ELV
	01/12/05	12/12/05	07/06/06	03/07/06*	13/09/06	14/11/06	
A1-1 (CHP)	201	210	168	265	Not measured	207	300
A1-2 (Boiler 1)	145	113	87	57	212	92	115
A1-4 (Boiler 3)	168	163	122	38	129	Not operating	115

\* From Emissions to Atmosphere Report No. 678CAR06\_1 by Euro Environmental Services on behalf of the Agency.

There are no records of monitoring data when using gas oil due to the restrictions in the current licence (*Condition 5.6 and Schedule 1(i)*) relating to the use of gas oil.

**6. Describe measures considered to date for the reduction of NOx and SOx emissions.**

A number of measures have been considered and implemented to reduce NOx and SOx emissions. These are:

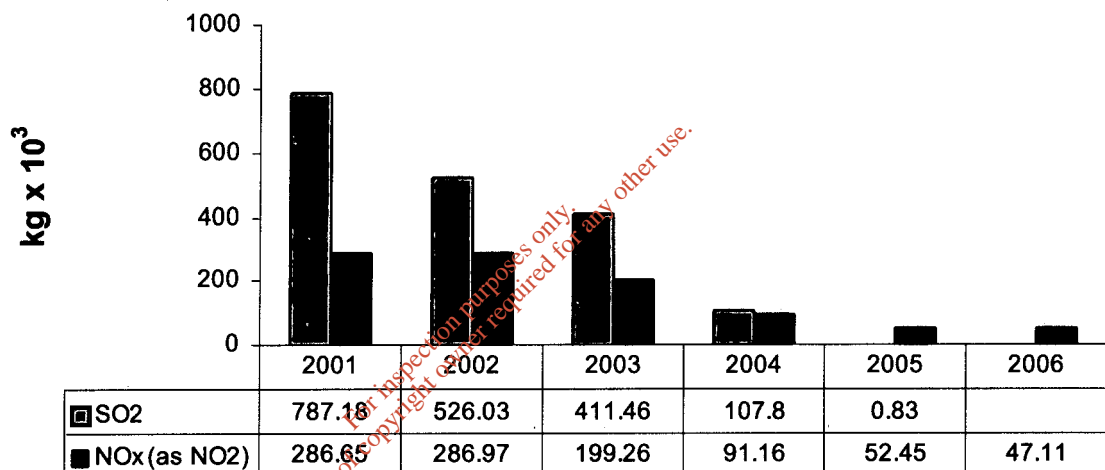
- The primary fuel used on site was switched from heavy fuel oil (HFO) to natural gas resulting in reduced NOx and SOx emissions.
- A CHP Plant was installed to generate electricity locally while reducing the requirement to raise steam from the boilers with reduced direct and indirect, NOx and SOx emissions.
- Direct Digital combustion control (DDCC) was fitted to both boilers where the effects of ambient conditions can be balanced out and constant combustion conditions achieved.

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- Wyeth Nutritionals have worked with the burner suppliers to ensure the burners are properly maintained and adjusted to achieve the optimum combustion efficiency with minimum emissions.

Calculated mass emissions from the site for both NOx (as NO<sub>2</sub>) and SO<sub>2</sub> since 2001 are shown in the chart below.

## Year-to-Year Mass Emissions of SO<sub>2</sub> and NOx (as NO<sub>2</sub>)



The chart demonstrates a reduction of almost 100% for SO<sub>2</sub> and over 80% for NOx (as NO<sub>2</sub>), as a result of the measures outlined above.

**7. Clarify the quantity of milk received in terms of tonnes per day and identify the class of activity that best describes the activity being carried out on your site.**

**Quantity of Milk**

There is no milk (liquid) used in the process, however, skim milk powder is one of the principal ingredients and is received in various bulk quantities from time to time.

**Class of Activity**

From the list of activities in the First Schedule to the Environmental Protection Agency Acts, 1992 and 2003, the following are the classes and types of activities that best describes those being carried out at Wyeth Nutritionals Ireland:

**Principal Class of Activity**

Class 7.2.2 – *The manufacture of dairy products where the processing capacity exceeds 50 million gallons of milk equivalent per year, not included in paragraph 7.2.1.*

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Other Class of Activity

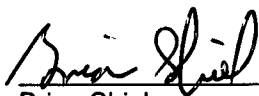
2.1 – *The operation of combustion installations with a rated thermal input equal to or greater than 50 MW.*

**8. Give details of the frequency of particulate monitoring carried out on the dryers and agglomerator.**

As no frequency was specified in the licence to carry out particulate monitoring on the dryers and agglomerator, Wyeth Nutritionals Ireland elected to carry out this monitoring biannually.

I hope the above information is satisfactory. However, if additional information is required, please don't hesitate to contact me by phone at 061 601 307 or by email at [shielb@wyeth.com](mailto:shielb@wyeth.com).

Yours sincerely,



Brian Shiel  
EHS Manager - Environment

Encl.: One copy of letter.

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