

# Cheminova A/S - Green Accounts 2009

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## Introductory particulars

<b>Name</b>	Cheminova A/S
<b>Location</b>	Thyborønvej 78 DK-7673 Harboøre Denmark
<b>Company mission</b>	We help improve quality of life for the world's population by supplying products that help farmers increase yields and quality of crops to satisfy the global demand for food, feed, fiber and energy.
<b>Telephone/Fax</b>	96 90 96 90/96 90 96 91
<b>Website</b>	<a href="http://www.cheminova.com">www.cheminova.com</a>
<b>Environmental supervision authority</b>	The Environmental Centre Aarhus under the Danish Ministry of Environment.
<b>Industrial sector</b>	Chemical industry.
<b>Primary activity</b>	Manufacture of basic plant protection products.
<b>Significant secondary activities</b>	Natural gas-fired CHP unit. Storage facilities for raw and finished products, waste-water treatment plant, laboratories for R&D and quality control, workshops and filling facilities.
<b>Point in the list in Annex to Statutory Order from the Ministry of Environment and Energy No. 975 of December 13, 1995</b>	D106. Enterprises engaged in the production of basic plant protection products or biocides.
<b>Holding company</b>	Auriga Industries A/S, P.O. Box 9, 7620 Lemvig, Denmark.
<b>CVR no.</b>	12760043

<b>P no.</b>	1.000.441.076
<b>Most significant environmental approvals</b>	<p>19.05.06 Revised ruling concerning the risk area</p> <p>15.12.06 Total electronic approval</p> <p>05.02.08 Triazol plant: Flutriafol and fluazinam (fungicides)</p> <p>05.02.08 VVM triazol plant</p>
<b>Certified management systems</b>	<p>Environmental management system: DS/EN ISO 14001:2004 and DS/OHSAS 18001:2008.</p> <p>Energy demand management system: DS 2403:2008.</p>
<b>Recipient</b>	The North Sea. The company is not connected to a public waste-water treatment plant as it has its own biological plant to treat the waste water.
<b>Qualitative indication of resource and environmental parameters</b>	<p>The company's most significant resource parameters concern the consumption of raw materials in the form of organic and inorganic chemicals, energy and water. Most of the resources are consumed in connection with the manufacture of plant protection products and intermediates thereof.</p> <p>The most significant environmental parameters concern the emission of solvents, CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub> and "odour" to the air and the discharge of nitrogen, phosphorus and combined organic carbon in waste water. Furthermore, waste is generated both in the form of hazardous waste and in the form of sludge from the company's biological treatment plant. Both types of waste are sent to approved waste-treatment facilities.</p> <p>The company's primary products, pesticides, are designed to have a biological effect on either insects (insecticides), plants (herbicides) or fungi (fungicides). The correct application of the substances is, of course, of material importance to preventing undesired environmental impacts. The products are therefore, in all the countries in which they are marketed, subject to statutory registration to ensure their correct application. The statutory limitations on their application are indicated on the product labels together with instructions for use.</p> <p>In connection with the production of pesticides, it is important that biologically active ingredients are not inadvertently spread to the surroundings. This is ensured through a combination of technical safety measures and a set of written procedures and instructions which employees must adhere to.</p>

## Statement by the management

### Information significant to understanding the environmental impacts of the company's activities

Against the background of an environmental-technical mapping, the most significant environmental impacts have been selected on the basis of the following criteria:

#### Resources:

The company's consumption of raw materials and auxiliary materials comprises a number of chemicals, some with potential environmental impacts. The consumption of raw materials and auxiliary materials has therefore been categorised according to the classification of the substances.

Energy has been included as it is a limited resource.

Water has been included as this resource is subject to attention by society.

#### Emissions to the air:

SO<sub>2</sub>, NO<sub>x</sub> and CO<sub>2</sub> are included on account of the attention generally given thereto by society. Furthermore, some specific chemicals are included according to demand from the Danish Environmental Protection Agency. Finally, odour is mentioned as being of local importance.

#### Discharges to water:

The company has its own biological waste-water treatment plant with micro-organisms which are particularly suited to break down the specific chemical compounds present in the waste water.

Phosphorus, nitrogen and organic substances are included on account of the attention generally given thereto by society. Furthermore, the discharge of cooling water is mentioned as being of local importance.

#### Waste:

Commercial waste, hazardous waste and sludge from the company's biological waste-water treatment plant are mentioned. The responsible handling of these types of waste is of material environmental importance.

**The company's  
environmental policy**

Spillage and waste:

In step with marked reductions in the overall environmental impacts of the company's activities on the air and water, "spillage and waste" which have an impact on the local environment for a short period have become the subject of increasing attention by society. Information about such events has therefore been included.

The environment, health and safety are important areas for Cheminova, and all the activities of the company are undertaken with due consideration being given to the fact that the company is endeavouring to continuously improve results within these areas.

Thus, the company is endeavouring to undertake all activities with due consideration being given to humans and the environment and to communicate openly, both internally and externally, about matters concerning the environment, health and safety.

This is achieved through:

- Compliance with all legislation, rules and regulations in force from time to time, including statutory requirements and other requirements affiliated by the company.
- The ongoing assessment of impacts and setting of targets for a reduction in emissions or the consumption of resources, including energy, and for the improvement of the occupational health and safety with account being taken of the best available technology.
- Prevention of pollution, unnecessary consumption of resources, accidents at work and injury of health.
- The maintenance of emergency services to reduce the consequences of any accidents.
- The choice of processes, raw materials and auxiliary materials in connection with the development of new products and the further development of existing products, taking account of their possible impacts on humans and the environment.
- Ensuring sufficient communication internally and in relation to the authorities.
- The maintenance of an open dialogue with cooperation partners and the public concerning the company's policies, targets and results.
- Ensuring that employees are able to meet the requirements made in respect of their work and that they are aware of their own impact on the environment and safety.

For a number of years, Cheminova has been affiliated with the Responsible Care programme, an agreement which lays down requirements concerning the company's work on, for example, its environmental policy and documentation. The programme has been developed by CEFIC, a trade organization for the European chemical industry.

At the end of 2009, Cheminova A/S has also joined the UN Global Compact which comprises ten principles of social responsibility based on internationally agreed conventions concerning labour practices, human rights, environment and anti-corruption. The strength of Global Compact is that it is universal and thus forms a common frame of reference for companies across frontiers.

## **Significant environmental aspects and targets**

### **Legislation**

Since 1988, Cheminova has had an overall environmental approval of its activities in Denmark. Since then, just under 200 supplementary approvals have been granted. The general environmental approval, which is very extensive, has in the period 2003 to 2006 been revised. The review has been divided into four main areas: General basic terms for the whole company, specific terms for the individual production plants, the discharge of waste water and gaseous emissions to the atmosphere. An essential part of the revision is a renewed waste-water approval based on EU's directive of October 23, 2000 concerning determination of conditions for the union's water political measurements the Water Framework Directive. The actual emission requirements have been settled according to the EU direction "Technical risk assessment TGD 2003" and announcement No. 1669 of December 14, 2006 modified in announcement No. 1016 of August 15, 2007.

EU's Water Framework Directive has to be implemented in the member states before 2015. In this way, the new waste-water approval is an important securing of the future production.

The company is subject to the EU Directive on the control of major-accident hazards involving hazardous substances. The current notification of risks has been accepted by the authorities in 2006. During the period 2010 to 2012 it will be updated in cooperation with the authorities.

In 2009, a total VVM statement for all Cheminova A/S' activities at Rønland has been prepared. It describes the environmental consequences of the current production and

forms a frame within which Cheminova A/S is allowed to change and increase the production at the site without this releasing a new VVM statement.

### **Certified management systems**

Cheminova A/S has an energy management system certified in accordance with DS 2403. Certification is required in order to be able to enter into an agreement with the Danish Energy Authority concerning more efficient utilization of energy.

In 2007, Cheminova A/S was certified according to ISO 14001 and OHSAS 18001. Recertification has been accomplished in 2009.

Status concerning objectives, targets and plans of action according to the certified management system for 2009 appears from enclosure 1, page 23.

### **Energy**

For a number of years, Cheminova has had an agreement with the Danish Energy Agency according to the Danish law about a government subsidy to some companies with a heavy consumption of energy. The benefit in this type of agreements is a reduced tax on the emission of CO<sub>2</sub>. The existing agreement expired in July 2006. A declaration of intent concerning a new agreement has been filed. A new agreement for a 3 year period was signed in December, 2009.

The agreement means that Cheminova A/S has to carry through a number of closer defined special energy saving projects.

The company has to carry through all identified projects concerning energy effektivisation and energy savings which have a simple payback time of less than four years and which concern energy consumption receiving increased compensation of tax on emission of CO<sub>2</sub> because of energy-intensive processes (heavy energy). cf. § 9 section 2 in the Act on CO<sub>2</sub> tax on certain energy products. The energy saving may be identified through implementation and use of the energy management system or the special projects.

## **Waste**

Until mid-2002, a phosphorous by-product which is produced on the basis of sludge from the company's biological waste-water treatment plant was sold to the Danish agricultural sector for fertilisation purposes under the name "Cheminova Fosfat". However, the agricultural sector now has a very considerable own production of phosphorous manure, compared to the consumption permitted. Furthermore, the authorities in many counties in Denmark have been very unwilling to issue the necessary spreading permits. Consequently, Cheminova has sought alternative uses abroad, but it has not been possible to obtain the necessary permits for the exportation of Cheminova Fosfat. This has meant that the possibilities for selling Cheminova Fosfat are now so limited that alternative handling methods are required. Since mid-2002, the product has been sent to a special-purpose depot in Norway.

## **Spillage and waste**

"Spillage and waste" is defined as operating disturbances which have an impact on the external environment for a short period of time as a result of human or technical errors. The impacts of such events will typically be of marginal importance, but may give rise to local inconveniences (odour, a visible cloud, etc.). It is the aim of the company to reduce the number of such events.

Spillage and waste has been registered systematically since the middle of 2001. The number of events increased in 2005 compared to the uniform levels in 2003 and 2004. In 2006, a number of initiatives have been initiated in order to reduce the number in the coming years. These efforts have been fruitful, and year by year, the number has been reduced. In 2009, the reduction was 56% compared to 2008.

The number of "spillage and waste" has totally been reduced from 46 in 2005 to 7 in 2009 corresponding to a reduction of 85%. See enclosure 2, page 24.

## **Transport**

Goods are transported to and from the company by road, rail and sea. In recent years, road transports have largely been replaced by rail and sea transport. Thus, more than 40 per cent of goods are now transported by rail or sea.

Transport by sea and rail is financially attractive for the transportation of large volumes. Furthermore, this benefits the environment in the form of reduced energy consumption per tonne transported.

**Environmental requirements in relation to sub-suppliers** In 2006, a supplier code has been formulated. Among other things the code includes environmental conditions. This has been further described in the company's annual CSR reports which are available on the company's website. State of affairs concerning supplier management will appear from the CSR report for 2009.

**Involvement of employees** All groups of employees are involved in the company's environmental activities. Project groups are formed in connection with the construction of new plants and major expansions. Compliance with environmental rules and regulations is a natural part of the daily work routines of the company's operating staff. This will be strengthened in connection with the current introduction of the environmental management system according to ISO 14001 and OHSAS 18001.

**Occupational risks** The company handles a wide range of chemical substances, including some which may give rise to occupational impacts if they are not handled correctly. The company possesses long-standing experience with the responsible handling of such products. Furthermore, the company has its own occupational health service which performs inspections and offers advice and guidance to the rest of the organisation about these matters.

In 2009, the company reported 19 accidents to The Danish Working Environment Service. The absenteeism due to accidents amounted to 3.2 hours per 1,000 hours worked. The absenteeism is relatively high and is primarily due to injuries to the motor apparatus such as the back, arms and legs.

It is very important to observe risky conditions before they develop and it is gratifying to state that the number of reports concerning "nearby accidents or error reports" is continuously increasing. In 2009, 237 "nearby accents or error reports" were reported.

The company follows the quality of the health and safety at work with different measurements of the working environment. A separate statement concerning occupational health and safety has been prepared.

**Relief of instances of non-compliance** In 2009, there has been non-compliance of the quantities of substances allowed to be led to the biological waste-water treatment plant. In order to rectify this, the internal acceptance levels for conducting substances to the waste water have been adjusted. The non-compliances in question have not resulted in non-compliance of the demands to the treated waste water which is discharged to the sea.

A discharge requirement to a finished product has also been exceeded in the waste-water discharge. The exceeding is due to generally bad treatment probably because of too little active sludge. This has resulted in increased attention at the treatment plant in order to avoid recurrence.

In addition, the self-policing of waste water shows an exceeding of the maximum demand for a single substance. As this exceeding is attached to the control tests of the authorities, the company has only been informed of the non-compliance when the analysis results were received by the end of the year. Therefore it has not been possible to make rectifying actions in the present situation.

It has not been possible to clarify the reason of a few small non-compliances of conditions of emission to the air from the waste-water incineration plant. Generally, the plant has been running well and stable during 2009 so we have found no reason for further relief in order to avoid repetitions.

In addition, reference is made to “Summary of self-policing” on page 14.

### **Deviations**

Any deviations in relation to previous versions of the company’s green accounts are stated in the individual sections.

### **Complaints**

In 2009, there have been no complaints from neighbours or others concerning the environmental conditions of the company.

## Information about environmental issues

### **Consumption of energy, water, raw materials and significant types and volumes of polluting substances**

The information is given in “Key figures for the environmental performance of Cheminova in 2009” for input and output in Annexes 2 and 3, respectively.

### **Energy**

In 2009, the consumption of energy has been lower than the previous year. This is primarily due to a reduced level of activity in the production.

### **Raw materials, auxiliary materials and products sold**

Cheminova has decided to categorise raw materials, auxiliary materials and products sold according to their classification. Where data are harmful to the environment, hazardous/toxic, corrosive/causing local irritation or inflammable, they have been included under the category harmful to the environment. Where data are hazardous/toxic, corrosive/causing local irritation or inflammable, they have been included under the category hazardous/toxic. Where data are corrosive/causing local irritation or inflammable, they have been included under the category corrosive/causing local irritation.

The variations between the different categories in the five years period ascribe to random fluctuations in production according to the demand for the different products.

### **Substitution**

The company is aware of the possibilities of substituting substances included in the “List of undesired substances” with other substances. In connection with the development of new processes, focus is on this issue. If a less dangerous substance can replace a more dangerous one, and the less dangerous substance has the same properties and is competitive as regards its quality and price, the least dangerous substance will be used.

### **Waste**

The large volume of waste deposited is mainly attributable to the deposition of sludge from the purification plant. For a period of more than ten years, the sludge was dried and reused as phosphorous fertiliser by farmers in Denmark. This problematic has been discussed in Statement by the management. As sludge accounts for by far the largest individual flow, this practice has a material impact on the company’s overall waste hierarchy.

The volume of hazardous waste has increased markedly compared to 2007 and 2008. This is especially due to a large quantity of waste water from a new production plant which has not been able to comply with the discharge demands and therefore this waste water has been disposed

of as hazardous waste at an approved receiver of waste.

### **Emissions to water**

It is necessary to add nutrients in the form of nitrogen to the micro-organisms in the waste-water treatment plant. A certain level of nitrogen is therefore "the price" for the break down of the chemical substances in the waste water. A reduction of the nitrogen level will easily result in a lower efficiency of the waste-water treatment plant resulting in insufficient treatment and risk of instances of non-compliance.

The cooling water consists of two separate systems: Internal and external. The internal cooling water is circulated in a closed system, which indirectly cools current production processes. This cooling water flow is then indirectly cooled by the external cooling water (bay water), which is drawn from Nissum Bredning and pumped back into the bay.

Generally, the self-policing of the waste water shows that demands have been complied with. The demand values for individual products have, however, been exceeded. In order to meet this problem, internal demands of quality have been changed.

The emissions of halogenated organic compounds have risen in 2009. This is due to waste water from a new production including many halogenated compounds.

### **Emission to air**

Emissions of SO<sub>2</sub> have risen compared to 2008. This is due to the fact that higher SO<sub>2</sub> emissions than normal have been seen in 2009 at the self-policing of the central air incineration plant.

The fall of the total NO<sub>x</sub> emission is due to less fuel consumption because of reduced production activities. Further, since 2008 a new key figure has been used in the calculation and has contributed to the increased volume of NO<sub>x</sub> compared to the years before 2008.

The company's hydrogen boiler, which burns waste hydrogen, has contributed with an almost insignificant emission of NO<sub>x</sub>. The heat from the burning is used for heating the administrative areas.

There is a fall in the CO<sub>2</sub> emission which is due to reduced production activities.

The company's central air cleaning plant has run well in 2009 with stable running and a minimum of omissions. An increase is seen in the halogenated organic compounds, which is due to the new production activities that include

many halogenated compounds.

In 2009, the waste-water incineration plant has been running stable and safely. The emissions of chlorine, inorganic compounds and dust have fallen.

**Emission of substances included in EPA's annex A in the guidance on green accounts**

Emissions of specific substances stated according to demands from the EPA are calculated according to the same principles since 2003. The new principle for calculation includes more specific substances than earlier. This applies for emissions to both air and water.

**Dust**

Dust emissions from one waste-water incineration furnace are being monitored continuously. The demand has been complied with.

**Noise**

The company's noise levels are well below the statutory requirements applicable at boundaries and in open countryside with 3 kilometres to the nearest neighbour, the company causes no inconvenience due to noise.

**Odour**

Air extracted from production and tank plants is incinerated in an air-incineration plant, causing the destruction of all odour substances. Air, which is not deemed to involve any health hazards, e.g. from room ventilation, is discharged directly into the open. Diffuse sources occasionally cause odours to be emitted from the company.

**Spillage and waste**

Events with spillage and waste are registered and divided into three categories. Categories 1 and 2 describe events, which have caused some environmental impact, while category 3 comprises events, which have had no environmental impact. "Key figures for the environmental performance of Cheminova in 2009" include events in categories 1 and 2. Most events are caused by technical errors.

The number of events has fallen in 2009 compared to 2008.

There has been one event in category 1 where to events causing essential environmental impact are assigned. The event in question was cracking of a chemical at a production plant. Hereby, a cloud of gas was shortly emitted, and as a matter of precaution the road to Thyborøn was closed for 20 minutes.

The other reported events can be placed in category 2 comprising events causing pollution on the level of inconvenience.


**Emissions to the soil**

In 2009, there have been 1 event of spillage and waste to unfortified areas. The number of these spillages and wastes has therefore fallen since 2007 where 9 events were reported. The background for this is increased attention to precisely this type of events.

## Summary of self-policing

This section contains conclusions concerning Cheminova's own measurements in 2009 on significant emissions. For each site, a conclusion and a table with measurement results and requirements have been prepared

### Summary of own measurements of emissions to the air in 2009

<p>Process emissions from production plants are cleaned in the central air-incineration plant.</p>	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Requirement</th> <th>Results</th> <th>No. of measurements</th> <th>Instances of non-compliance</th> </tr> </thead> <tbody> <tr> <td>Odour</td> <td>OU/s</td> <td>450,000</td> <td>129,441</td> <td>12</td> <td></td> </tr> <tr> <td>Out time</td> <td>%</td> <td>2.5</td> <td>2.1</td> <td></td> <td></td> </tr> <tr> <td>Main group I class 1*</td> <td>mg/Nm<sup>3</sup></td> <td>0.25</td> <td>0</td> <td>2</td> <td></td> </tr> <tr> <td>Main group I class 2</td> <td>mg/Nm<sup>3</sup></td> <td>2.5</td> <td>0.017</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II class 1</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0.45</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II class 2</td> <td>mg/Nm<sup>3</sup></td> <td>100</td> <td>4.25</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II class 3</td> <td>mg/Nm<sup>3</sup></td> <td>300</td> <td>15.5</td> <td>2</td> <td></td> </tr> <tr> <td>Main group II, sum class 1+2+3</td> <td>mg/Nm<sup>3</sup></td> <td>300</td> <td>20.2</td> <td>2</td> <td></td> </tr> <tr> <td>Hydrogen bromide</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0.4</td> <td>2</td> <td></td> </tr> <tr> <td>Hydrogen chloride</td> <td>mg/Nm<sup>3</sup></td> <td>100</td> <td>3</td> <td>2</td> <td></td> </tr> <tr> <td>Hydrogen fluoride</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0.2</td> <td>2</td> <td></td> </tr> <tr> <td>Hydrogen sulphide</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0</td> <td>2</td> <td></td> </tr> <tr> <td>TOC</td> <td>mg/Nm<sup>3</sup></td> <td></td> <td>25</td> <td>AMS**</td> <td></td> </tr> <tr> <td>Sulphur dioxide</td> <td>mg/Nm<sup>3</sup></td> <td>400</td> <td>44</td> <td>2</td> <td></td> </tr> </tbody> </table>	Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance	Odour	OU/s	450,000	129,441	12		Out time	%	2.5	2.1			Main group I class 1*	mg/Nm <sup>3</sup>	0.25	0	2		Main group I class 2	mg/Nm <sup>3</sup>	2.5	0.017	2		Main group II class 1	mg/Nm <sup>3</sup>	5	0.45	2		Main group II class 2	mg/Nm <sup>3</sup>	100	4.25	2		Main group II class 3	mg/Nm <sup>3</sup>	300	15.5	2		Main group II, sum class 1+2+3	mg/Nm <sup>3</sup>	300	20.2	2		Hydrogen bromide	mg/Nm <sup>3</sup>	5	0.4	2		Hydrogen chloride	mg/Nm <sup>3</sup>	100	3	2		Hydrogen fluoride	mg/Nm <sup>3</sup>	5	0.2	2		Hydrogen sulphide	mg/Nm <sup>3</sup>	5	0	2		TOC	mg/Nm <sup>3</sup>		25	AMS**		Sulphur dioxide	mg/Nm <sup>3</sup>	400	44	2	
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<p>Separate process emissions from the production of phosphorous insecticides (P-1 scrubber).</p> <p>The measurements in 2009 show that the requirements were complied with.</p>	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Requirement</th> <th>Results</th> <th>No. of measurements</th> <th>Instances of non-compliance</th> </tr> </thead> <tbody> <tr> <td>Hydrogen sulphide</td> <td>mg/Nm<sup>3</sup></td> <td>5</td> <td>0.28</td> <td>1</td> <td></td> </tr> <tr> <td>Carbon sulphide</td> <td>mg/Nm<sup>3</sup></td> <td>100</td> <td>7.72</td> <td>1</td> <td></td> </tr> </tbody> </table>	Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance	Hydrogen sulphide	mg/Nm <sup>3</sup>	5	0.28	1		Carbon sulphide	mg/Nm <sup>3</sup>	100	7.72	1	
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Waste water from the glyphosate plant is incinerated in the waste-water incineration plant.



Measurements in 2009 show that there have been a few instances of non-compliance as the emission requirements of TOC, CO and NO<sub>x</sub> have been exceeded in a few cases. The reason is not known.

Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance
Hydrogen chloride	mg/Nm <sup>3</sup>	10	0.67	6	
Metals	mg/Nm <sup>3</sup>	0.5 - 5	0.0283	2	
TOC	mg/Nm <sup>3</sup>	10	5.67	6	Yes
Dust	mg/Nm <sup>3</sup>	10	4.6	2/AMS*	
NO <sub>x</sub>	mg/Nm <sup>3</sup>	400	In 1 day the average is >400 mg/Nm <sup>3</sup>	AMS	Yes
CO	mg/Nm <sup>3</sup>	50	In 1 day the average is >50 mg/Nm <sup>3</sup>	AMS	Yes

\* Measured partly continuously and partly by 2 work measurements.

At the Claus plant, sulphur from the process air from the P-1 plant is recovered.



Measurements in 2009 show that requirements were complied with.


Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance
SO <sub>2</sub>	kg/h	78	0.055	2	
H <sub>2</sub> S	mg/Nm <sup>3</sup>	5	0.003	2	

Air emissions from the biological purification plant.



Measurements in 2009 show that requirements were complied with.

Parameter	Unit	Requirement	Results	No. of measurements	Instances of non-compliance
Odour	OU/s	500,000	30,920	6	
Main gr. I class 2	mg/Nm <sup>3</sup>	2.5	0.6	6	
Main gr. II class 1	mg/Nm <sup>3</sup>	5	0.9	6	

Emissions from the CHP plant.	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Requirement</th> <th>Results (measuring intervals)</th> <th>No. of measurements</th> <th>Instances of non-compliance</th> </tr> </thead> <tbody> <tr> <td>NO<sub>x</sub>*</td> <td>mg/Nm<sup>3</sup></td> <td>200</td> <td>93</td> <td>1</td> <td></td> </tr> <tr> <td>CO</td> <td>mg/Nm<sup>3</sup></td> <td>150</td> <td>7.5</td> <td>1</td> <td></td> </tr> </tbody> </table>					Parameter	Unit	Requirement	Results (measuring intervals)	No. of measurements	Instances of non-compliance	NO <sub>x</sub> *	mg/Nm <sup>3</sup>	200	93	1		CO	mg/Nm <sup>3</sup>	150	7.5	1	
Parameter	Unit	Requirement	Results (measuring intervals)	No. of measurements	Instances of non-compliance																		
NO <sub>x</sub> *	mg/Nm <sup>3</sup>	200	93	1																			
CO	mg/Nm <sup>3</sup>	150	7.5	1																			
	<p>* The three turbines are equipped with low-NO<sub>x</sub> turbines.</p>																						
Measurements in 2009 show that CO and NO <sub>x</sub> requirements were complied with.																							

**Summary of own measurements of cooling water discharges in 2009**

<p>The cooling water consists of two separate systems: Internal and external. The internal cooling water is circulated in a closed system, which indirectly cools current production processes. This cooling water flow is then indirectly cooled by the external cooling water (bay water), which is drawn from Nissum Bredning and pumped back into the bay.</p>	<p><b>Requirements:</b></p> <ul style="list-style-type: none"> <li>No substances injurious to the environment must be added to external cooling water.</li> <li>The cooling water temperature must, as an annual average, not be raised by more than 9°C and never by more than 15°C.</li> </ul> <p><b>Results in 2009:</b></p> <ul style="list-style-type: none"> <li>Ammonia was found in the external cooling water in one case. The case was in August, and the measurement showed 0.5 mg/l. The reason for the content of ammonia is not known and it has not been seen since then.</li> <li>The average temperature increase was 4.9°C. The max. temperature increase measured was 7.0°C. A total of 12 measurements were carried out.</li> </ul>
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## Summary of own measurements of waste-water discharges in 2009

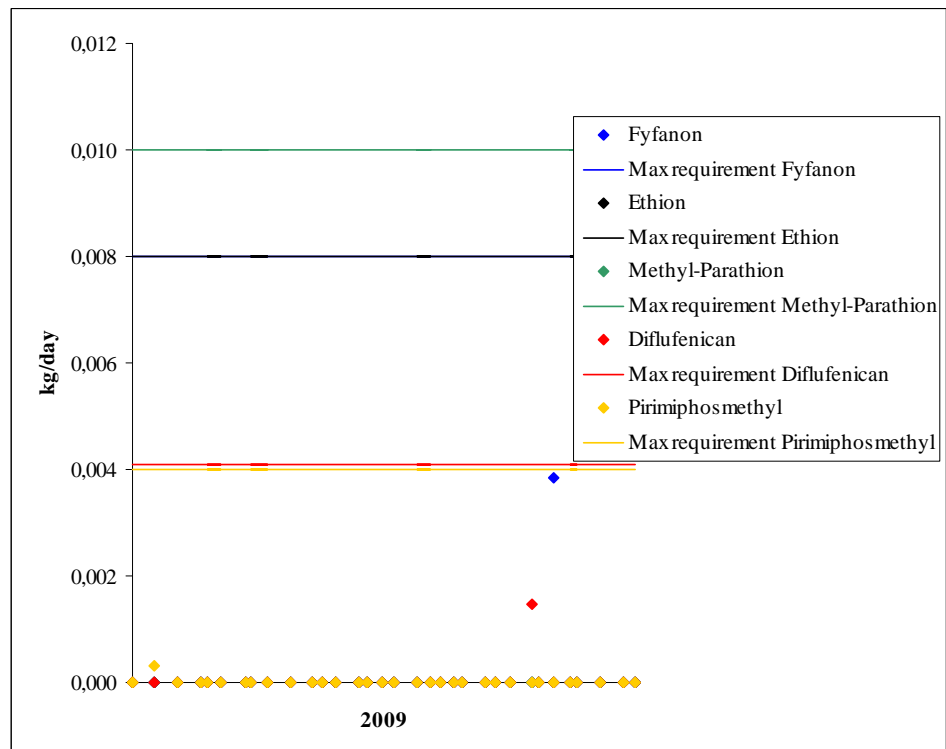
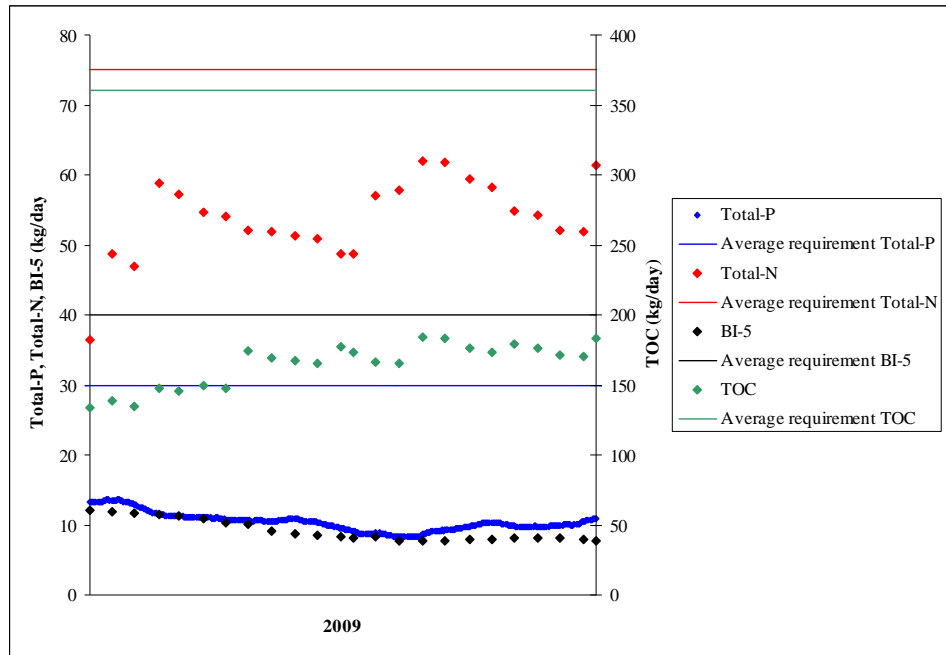
The waste water is purified in the biological treatment plant. Here, organic phosphorous compounds are converted into inorganic phosphorus by means of micro-organisms. Following sedimentation, the purified water is pumped into the North Sea. The sludge is deposited.

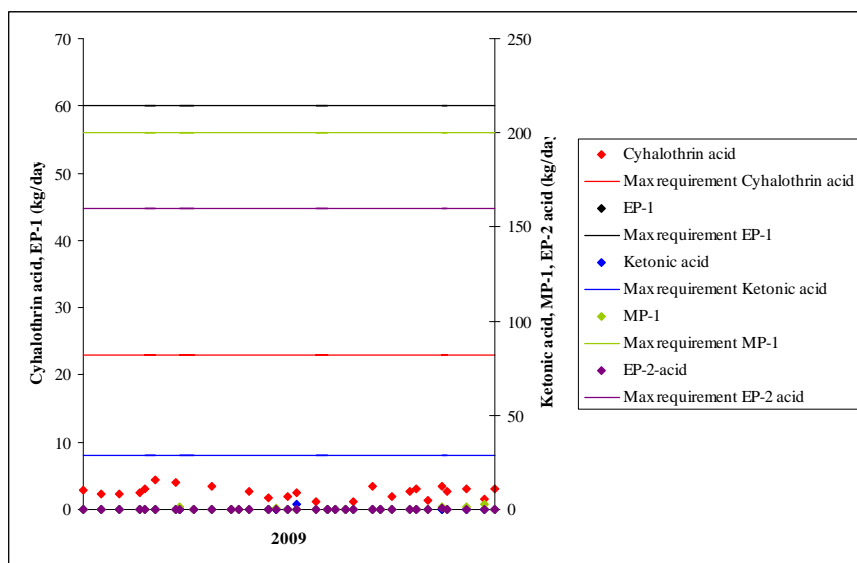
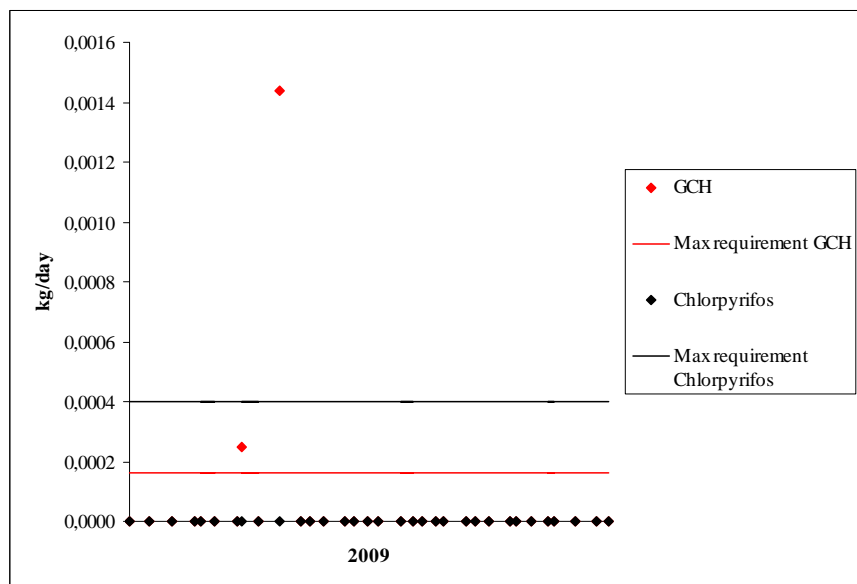
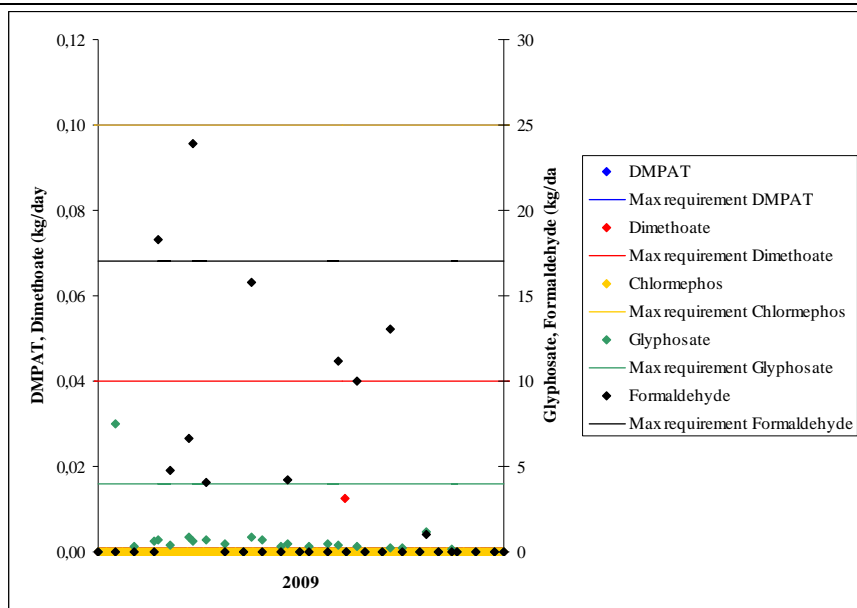


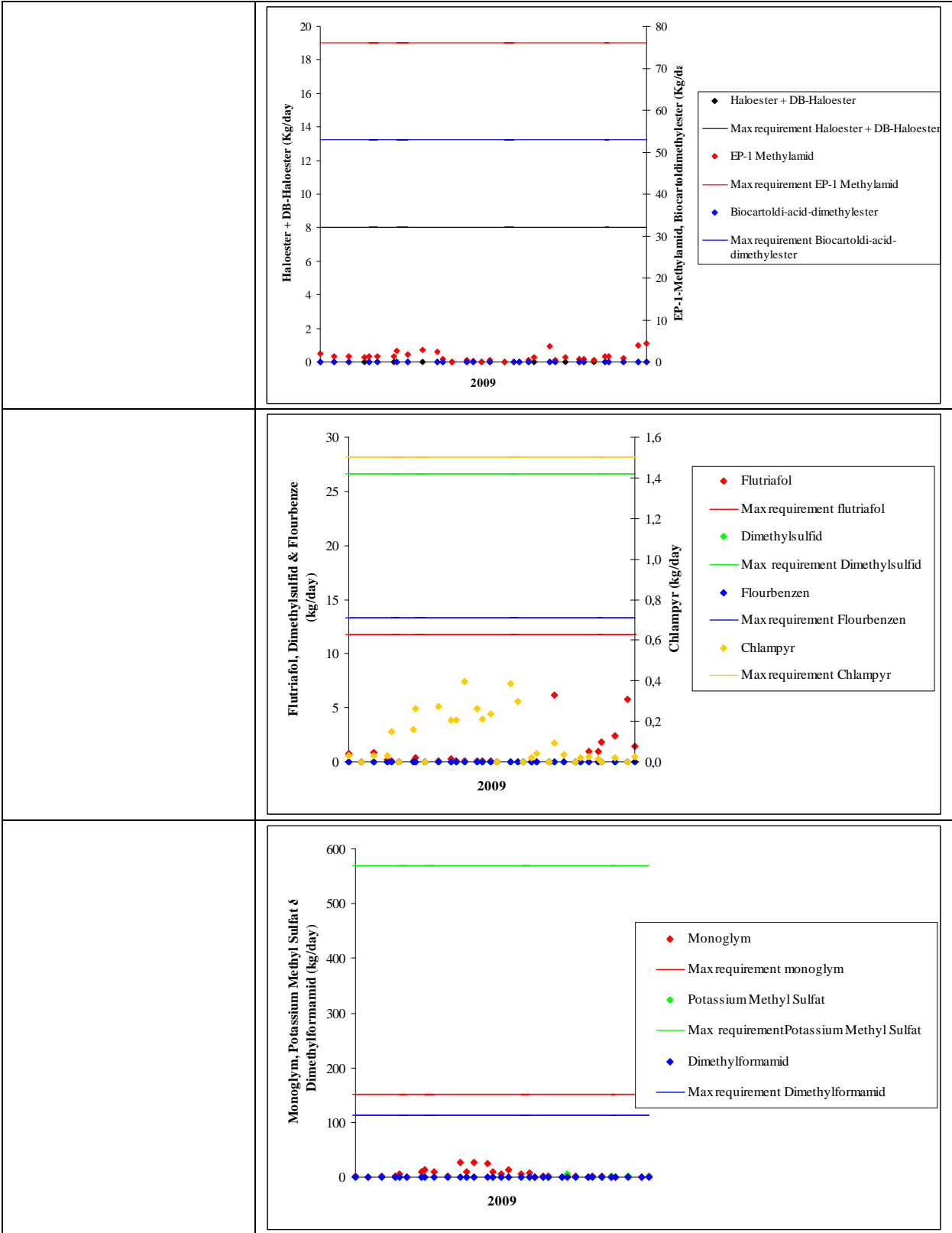
Measurements in 2009 show incidents of non-compliances as the requirements for supply of difluorbenzophenon, fluazinam and GCH to the biological treatment plant have been exceeded. The emission requirements for glyphosate has been exceeded, and there has been a non-compliance of a max. requirement for formaldehyde. The environmental permission for the discharge of waste water was revised as per July 1, 2005.

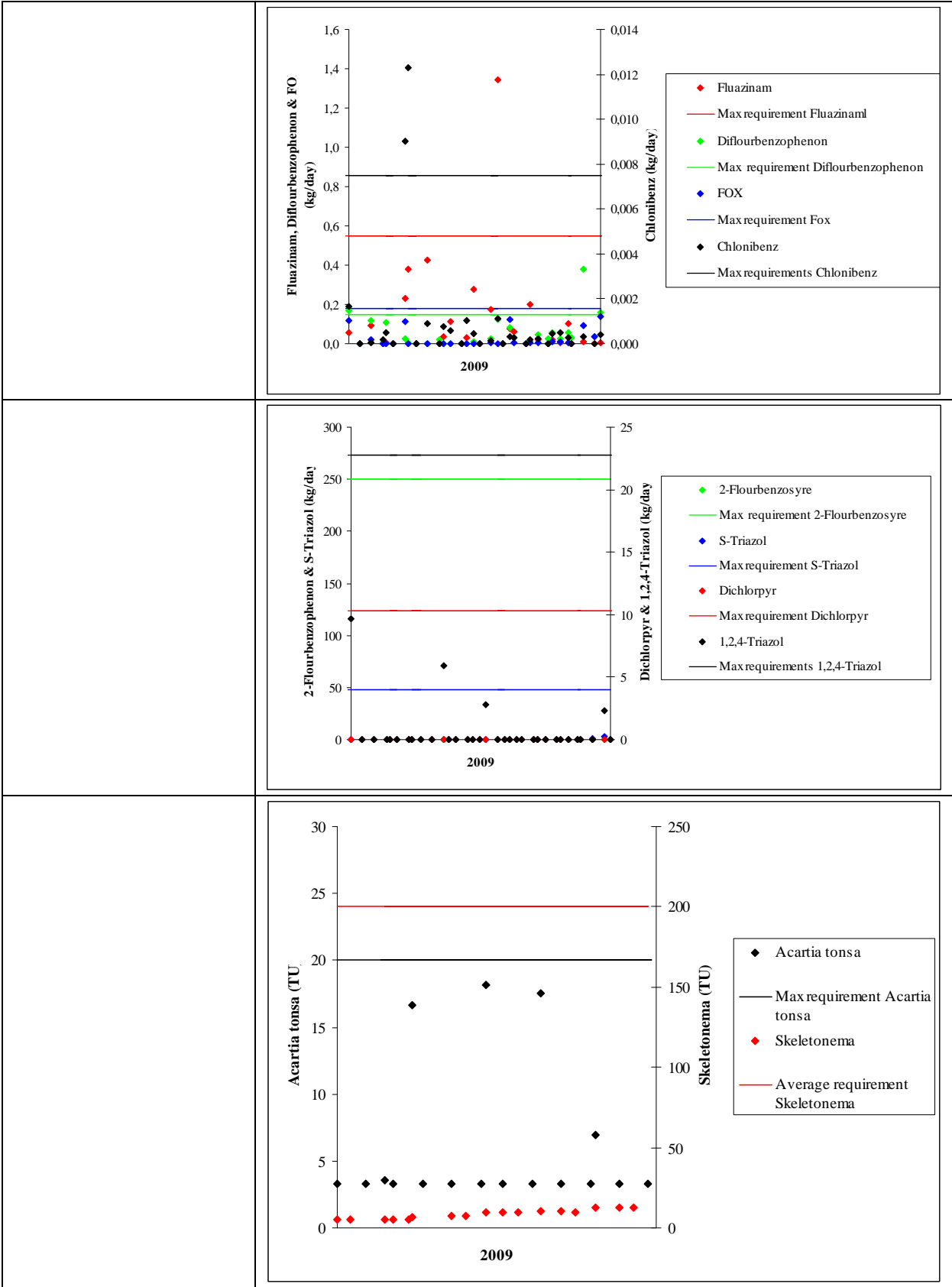
At the revision, EU's Water Framework Directive was incorporated. This has meant that at the evaluation of the impact of the single compounds on the receiver larger safety margins than so far have been put in.

The result is that a number of requirements have been sharpened quite a lot.









## Annex 1

### Objectives, targets and plan of action - Status at the end of 2009 according to the certified management system

#### Management and information

	Target/Activity	Schedule	Control criteria	Status
1.	Prepare guidelines for the control of potential settlements of fixed installations	1st half 2009	Guidelines are certified	Deadline changed to 1st half 2010

#### External environment

	Target/Activity	Schedule	Control criteria	Status
2.	The number of incidents causing pollution on a level of inconvenience is reduced by 10% per year with 2005 as basic year. This is done by improving prevention through implementation of a more thorough and documented analysis of each incident	2006-2009	Procedure has been documented by instructions in the environmental management handbook. Target number has been attained	Number of incidents has been reduced by 56% in 2009 compared to 2008. So the target has been fulfilled. A thorough analysis of the incidents (local inquiry) has been accomplished in all reported cases and the agreed actions have been carried out
3.	Campaign for sorting waste with a view to improved sorting	Autumn 2009	Campaign planned and carried out	Information about proper marking and packing of hazardous waste accomplished in August/September 2009. The subject will currently be resumed when needed but not as a fixed goal
4.	Carry out registration of the pre-registered substances which must be registered before the end of 2010	2010	Receipts for the registrations received	Runs according to plan
5.	Consumption of chemicals by the production of GCH is reduced by 1% per year. Measuring parameter is raw material costs in firm prices with 2005 as basic year	2006-2010	Improvement has been demonstrated	An optimization project has been run at the plant. As example can be mentioned that the output of a process stage has been improved with up to 8%. The total improvement has not yet been calculated
6.	Examine the possibilities of reducing the loss of tripol at the cyfos plant through recovery from mother liquor	July 15, 2009	The technical and financial possibilities have been illustrated and certified	Executed
7.	Reduce the consumption of raw materials and the need for treatment of waste water by producing PMIE	August 1, 2010	Possibilities have been examined and certified. Decision concerning investment has been made. Plant project has been accomplished and transferred to the production department	Examinations have shown that there is no financial gain in running the project. Project closed
8.	Filtration of fines from PMIE mother liquor	August 1, 2009	Plant project has been accomplished and transferred to the production department	Executed

## Energy

### Objectives:

- To minimize the energy consumption per produced volume at comparable quantities of production.
- Energy saving projects with a pay-back time of less than 4 years will be accomplished.
- The energy groups must continuously try to identify energy-saving projects and contribute to accomplish relevant projects.

	Target/Activity	Schedule	Control criteria	Status
9.	Examine the possibilities of the company to adjust power consumption and power production to the price signals in the electricity system. Comprised by the agreement with the Danish Energy Agency	March 2006 - June 2009	Report to the Danish Energy Agency available	Report sent to the Danish Energy Agency on June 29, 2009
10.	Further concentration of the waste water from the glyphosate plant	March 1, 2010	Plant put into operation and workable. Reduction of the volume of waste water to incineration with up to 50%	Deadline changed to August 1, 2010
11.	Estimate of the consequences by a simplification of the brine system at the Raff P-1 and Multipurpose plants where internal brine is changed with external brine and where the use of circulating pumps has been optimized	End 2009	Project presentation with illustration of the consequences of simplification is available	Project presentation expected to be ready end February. Working environment is improved and energy savings of about 10 kW are expected. Deadline changed to March 1, 2010
12.	Examination of the possibilities of running the biological treatment plant with only two reactors	August 1, 2009	Stable running of 2 bioreactors and with less energy consumption than with 3 reactors in operation	Project is not accomplished as treatment turns bad almost immediately. Further, the energy saving is doubtful
13.	Use of refrigerating plants in rooms for electrical equipment to be compared with the use of brine for cooling	July 1, 2009	Report containing a technical and financial comparison is available	Executed
14.	Closing down one of two steam pipes to the south of factory area	August 2009	The job is finished, and the modification is in operation	Executed
15.	Estimation of the use of the discharge air rich in oxygen from the APSA plant at the Claus plant	End 2009	Estimation is reported	Executed
16.	Estimation of reuse of heat from the waste-water incineration plants	End 2010	Estimation is reported	Estimation accomplished with a negative result. Project closed. A broader project has been defined "Utilisation of waste heat in general"
17.	In order to reduce the energy consumption at the Norit plant and the air incineration plant a project proposal is prepared illustrating the possibilities of controlling the air to the Norit plant	2009	Project proposal including a description of the technical possibilities, economy, safety and operational conditions is available	Not executed

## Occupational health and safety

	Target/Activity	Schedule	Control criteria	Status
18.	Carry out campaigns in order to improve the occupational health and safety	Currently	At least one campaign each quarter is carried out	Running as planned
19.	Determine the extent of inspection of lifting gears and ropes	2nd half 2009	The extent has been determined for all relevant types, and it is certified in the environmental management system	Extent determined and certified in the environmental management system

20.	The risk of work-related injuries and other unwanted consequences is reduced by goal-oriented securing of the qualifications of the employees. Demand for education/training, follow-up and documentation is determined	March 1, 2010	The necessary changes of the environmental management system have been implemented	Work initiated
21.	Arrangement of a seminar for the company's safety organisation, works managers and foremen with the purpose of ensuring an engaged and up-to-date organisation	Seminar to be held in 4th quarter 2009. Implementation of possible changes in 1st quarter 2010	A successful seminar has been held. Possible changes have been implemented	Programme prepared. The seminar will be held on May 20, 2010
22.	In order to ensure further qualification of the safety representatives, focus will be put on the demands for these, their tasks, training etc.	October 1, 2009	Job descriptions for safety representatives are available. Possibilities of training has been made visible	Job descriptions prepared

## Annex 2

### Key figures for the environmental performance of Cheminova in 2009, Input

Input	Method	Unit	2009	2008	2007	2006	2005
Total energy	M	MWh	447101	503911	485050	544299	563528
• Natural gas	M	MWh	377858	423554	409483	465564	480359
• Electricity consumed	M	MWh	68743	79907	74977	78201	81179
• (Oil, diesel, petrol)	M	MWh	500	450	590	534	1990
Water							
• Waterworks water	M	1,000 m <sup>3</sup>	714	792	749	779	842
• Cooling water (bay water)	M	mio. m <sup>3</sup>	46	50	49	51	54
Total raw materials	M	Tons	103357	133706	111777	124185	136114
• Unclassified	M	Tons	10940	12059	11250	13791	15113
• Corrosive/causing local irritation	M	Tons	21053	32147	25397	29824	34026
• Hazardous/toxic	M	Tons	49231	54925	44595	49813	53093
• Inflammable	M	Tons	8670	14378	13087	13592	15530
• Harmful to the environment	M	Tons	13463	20197	17448	17165	18352
• Substances on the "List of undesired substances" <sup>1</sup>	M	Tons	3388	4493	3516	3866	3931
Total auxiliary substances	M	Tons	44852	50040	44381	47922	53623
• Unclassified	M	Tons	4054	2343	1467	1931	2443
• Corrosive/causing local irritation	M	Tons	18859	23028	22940	23851	27785
• Hazardous/toxic	M	Tons	21561	24177	19699	21886	22740
• Inflammable	M	Tons	106	55	8	30	370
• Harmful to the environment	M	Tons	272	437	267	242	285
• Substances on the "List of undesired substances" <sup>1</sup>	M	Tons	621	562	938	664	521
Total packaging	M	Tons	5523	5811	5312	6387	5754
• Metal (drums)	M	Tons	1059	1292	1370	1856	1807
• Plastics (pallet tanks/drums/containers)	M	Tons	2264	2186	2117	2310	2148
• Cardboard	M	Tons	709	681	484	522	433
• Wood	M	Tons	1491	1652	1341	1699	1366

M: Measured. C: Calculated

<sup>1</sup> Substances listed on the "List of undesired substances" are also included in the categorisation by classification.

## Annex 3

### Key figures for the environmental performance of Cheminova in 2009, Output

Output	Method	Unit	2009	2008	2007	2006	2005
Energy							
• Electricity sales	M	MWh	83068	94475	87393	102826	101918
Products							
• Product sales, total	M	Tons	37484	49747	49796	52575	53504
• Unclassified	C	Tons	33	26	20	48	71
• Corrosive/causing local irritation	C	Tons	2649	3355	3934	5910	6300
• Hazardous/toxic	C	Tons	21492	28437	28400	28752	32184
• Harmful to the environment	C	Tons	13310	17982	17442	17865	14949
Waste							
• Waste for recycling, total	M	Tons	2214	3298	2801	2904	3364
• Paper and cardboard	M	Tons	137	187	169	165	159
• Packaging materials	M	Tons	235	213	136	85	158
• Metal	M	Tons	385	304	323	575	342
• Organic waste from canteen	M	Tons	16	16	13	14	13
• Recyclable oil waste	M	Tons	11	9	4	13	6
• Sand-blasting agent <sup>2</sup>	M	Tons				21	25
• Electrical scrap and IT equipment	M	Tons	11				
• Recovered raw sulphur	M	Tons	1419	2569	2152	2026	2661
• Waste for incineration, total	M	Tons	1066	993	857	976	931
• General household waste	M	Tons	67	67	72	65	63
• Industrial waste	M	Tons	95	87	71	78	83
• Active coal	M	Tons	883	811	691	806	755
• Building waste	M	Tons	13	16	11	14	18
• Confidential papers	M	Tons	8	12	12	13	12
• Total depositing	M	Tons	34026	34451	31296	36450	41071
• Building waste	M	Tons	24	15	25	17	28
• Industrial waste	M	Tons	20	23	16	2	3
• Sludge from purification plant (wet)	M	Tons	33982	34413	31255	36431	41040
• Hazardous waste <sup>3</sup>	M	Tons	9809	9136	6127	4970	2661
• Total waste	M	Tons	47115	47878	41081	45300	48027

M: Measured. C: Calculated

<sup>2</sup> From 2007, the sand-blasting agent can no longer be re-used.

<sup>3</sup> Hazardous waste is destroyed by approved facilities.

Output	Method	Unit	2009	2008	2007	2006	2005
Emissions to water							
• Cooling water	M	mio. m <sup>3</sup>	46	50	49	51	54
• Waste water	M	mio. m <sup>3</sup>	1.1	1.3	1.3	1.3	1.3
• Biological oxygen consumption, BI <sub>5</sub>	C	Tons	3	6	4	5	6
• Total organic carbon, TOC	C	Tons	65	53	44	47	97
• Total phosphorus, P	C	Tons	3.8	5	4	4	5
• Total nitrogen, N	C	Tons	17	17	22	20	19
• Chrome	C	kg	4	9	15	5	11
• Metal H1	C	kg	22	42	61	41	32
• Mercury	C	kg	<0.2	<0.3	<0.6	<0.6	< 0.9
• Arsenic	C	kg	52	72	66	75	70
• Cadmium	C	kg	0.16	0.2	0.1	2.9	< 0.4
• Nickel	C	kg	48	79	67	52	58
• Zinc	C	kg	8	9	33	65	<70
• Halogenating organic compounds	C	kg	1543	1434	722	980	1208
• Phenols	C	kg	96	113	98	93	372
Emissions to air <sup>4</sup>							
• Flue gas	C	1000 tons	1314	1571	1399	1628	1607
• Sulphur dioxide, SO <sub>2</sub>	C	Tons	20	13	36	259	403
• Nitrogen oxide, NO <sub>x</sub>	C	Tons	163	170	102	112	128
• Carbon dioxides, CO <sub>2</sub>	C	1000 tons	90	104	97	110	116
• Metal H1	C	kg	0.16	0.20	36	0.34	0.30
• Cadmium <sup>5</sup>	C	kg					0.08
• Arsenic	C	kg	0.18	0.15	0.7	0.44	1.01
• Halogenating organic compounds	C	kg	7915	3697	3100	5400	4680
• Chlorine and inorganic chlorine compounds	C	kg	1287	8818	9804	1900	1904
• PM10 (dust)	C	kg	313	459	11277	589	598
Odour							
	C	1000 OU/sec.	63	121	124	123	191
Spillage and waste <sup>6</sup>							
• Emissions to soil	M	No.	8	17	21	37	46
• Other unintended events	M	No.	1	3	9	6	13
	M	No.	7	14	12	31	33

M: Measured. C: Calculated

<sup>4</sup> Emissions to air are inclusive of the emissions caused by the electricity sold.

<sup>5</sup> Cadmium has not been measured in 2006 and 2007 according to agreement with the authorities.

<sup>6</sup> A systematic registration of spillage and waste has been implemented in 2002.

**Annex 4**

Cheminova A/S  
P.O. Box 9  
DK-7620 Lemvig



AAR Business  
J. No. AAR-432-00078  
Ref. elgle/antkr  
March 24, 2010

**Statement concerning Green Accounts 2009 for Cheminova A/S**

The Environmental Centre Aarhus under The Danish Ministry of Environment has received the Green Accounts 2009 for Cheminova A/S.

**Statement**

The information in the green accounts for 2009 corresponds to the supervising authority's impression of the company. We have no information about other important conditions which in our opinion should be included in the green accounts.

**Complaints**

It shall be mentioned, however, that to the best of our knowledge the Environmental Centre Aarhus has received no complaints of Cheminova in the accounting year in question.

Yours faithfully

Else Glenting  
[elgle@aar.mim.dk](mailto:elgle@aar.mim.dk)  
Tel. 72 54 83 12

Anders T. Kristensen  
[antkr@aar.mim.dk](mailto:antkr@aar.mim.dk)  
Tel. 72 54 82 35

## **Basis of assessment**

The statement relates to the following information in the green accounts, yet the Environmental Centre has not estimated relations concerning depositing of compounds on soil, disposal of waste and emission of waste water to public sewer as the municipality supervises these conditions:

### *Basic information:*

- The company has been environmentally approved under these list points.
- Information about the company's most essential environmental approvals, including information about the receiver of direct discharge of waste water and about connection approvals to public waste-water plants.
- Date of the latest revision of the company's environmental approval(s).
- The short qualitative description of the most important resource and environmental conditions characterizing the company's main activities and possible secondary activities.

### *Statement by the management:*

- An account of what the company has done throughout the financial year to rectify incidents of non-compliance and to prevent possible repeats.

### *Environmental issues:*

- Information about the company's essential consumption of energy, water and raw materials.
- Information about essential species and quantities of polluting substances which
  - form part of the production processes .
  - are discharged to air, water and soil.
  - form part of the company's products.
  - form part of the company's waste.
- Information about the company's production and handling of waste.
  - the total quantity of waste.
  - division of the quantity of waste into essential fractions.
  - the company's efforts to sort the waste.
- Information about noise, dust and odour conditions
- Information about possible environmental conditions in §7, section 1, that are not relevant to the company.

### *Summary of self-policing:*

Summary of the results of the company's self-policing showing in a survey how the measuring results of the company are compared to the conditions of the approval.