

The report deals with Kemira Group companies in line with financial reporting. The data has been compiled from 73 production plants and sources globally. Whilst every effort has been made to ensure that the information is neither incomplete nor misleading, it cannot be considered as reliable as the financial data of the Annual Report. This report has been prepared, where applicable, in accordance with:

- CEFIC (European Chemical Industry Council): Health, Safety and Environment Reporting Guidelines. November 1998.
- Commission recommendation on the recognition, measurement and disclosure of environmental issues in the annual accounts and annual reports of companies. European Commission, 2001/453/EC.

## Summary

The Johannesburg summit of last September highlighted global environmental and social issues, which continue to be a growing challenge for multinational corporations. At the same time, the regulatory business environment is changing fast, especially due to the introduction of proposals for greenhouse gas trading and tightened chemicals regulations in Europe.

Kemira's environmental situation was relatively stable in 2002, after step-wise reductions in many releases in 2001. The inclusion for the first time of several US plants did not change the reported figures substantially. The environmental businesses continued to grow across a wide product palette.

While progress was made in many areas of safety, one person died in a regrettable accident at the paint plant in Latvia.

## Highlights of activities at the sites

**Pulp & Paper Chemicals.** Kemira Chemicals Inc., USA, began to put into practice the revised Responsible Care programme. This includes an auditable management system and a security code. At Fortville, closing of the sodium silicate furnace reduces combustion emissions significantly, obviating the need for an air permit. Soil investigations and limited remedial activities took place at some of the sites.

The Krems plant in Austria installed a monitoring system to allow early detection of any contaminants in the cooling water. The record flooding of the Danube did not cause significant damage at the site.

In Finland, the Vaasa plants are preparing an application for a new integrated environmental permit covering the best available techniques. The sedi-

ment remediation studies of the nearby lake continued.

The hydrogen peroxide plant in Maitland, Canada, improved energy efficiency and investigated successfully the landfilling criteria of spent alumina, a presently sold byproduct. At the Ulsan plant in South Korea, no significant problems were observed in an odour study. The Rozenburg plant reduced losses of catalyst and solvent, and proceeded with ISO 14001. At Oulu, Finland, more efforts were made to prevent occasional organic releases into water from the hydrogen peroxide plant.

**Kemwater.** In Sweden, Kemwater Närke optimized scrubbing systems and improved safety in loading and unloading. The Goole plant in UK now recycles all waste water into production. ISO 14001 and 9001 certificates were issued to the Rheinberg plants in Germany. In France, the Lauterbourg plant investigated potential for reducing energy and water consumption. A restricted leak of hydrochloric acid occurred in September. The three plants in the Czech Republic reduced steam consumption substantially.

Kemira Ibérica minimized dust at the Tarragona site and obtained new permits for some of the six sites in Spain and Portugal. Additional information on waste classifications and emissions was compiled for the authorities. The Cremona plant in Italy improved safety by changing over to liquid sodium chlorate raw material.

The São Paulo plant in Brazil is getting ready for ISO 14001 certification. An occasional discharge of ferrous sulfate was caused by heavy rain.

**Industrial Chemicals.** The Kemira Pigments plant in Pori, Finland, invested in more effective pigment dust

separation as part of its project for increasing capacity. The waste water purification systems have been working excellently, and the discharge point was moved closer to the shore. Plans were also outlined for closing the existing ferrous sulphate piling areas. R&D projects for decreasing the amount of solid effluents and for developing new co-products continued.

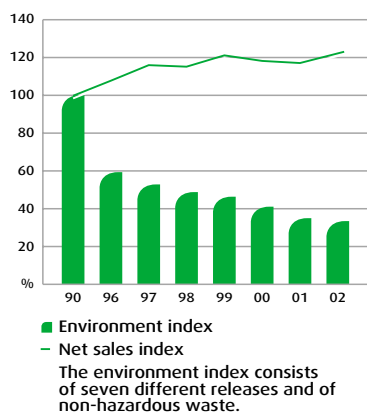
The Helsingborg plant in Sweden improved treatment of waste water from the hydrochloric acid plant. The sodium tripolyphosphate plant was closed, resulting in lower dust emissions and waste generation. A minor on-site landfill was closed and a renovation plan for the separate Rökille landfill was prepared to implement the EU regulations, with no immediate action required.

The Oulu plant expanded formic acid capacity without significant environmental changes. An investment project was started for improving soot treatment. The site's cooling water was accidentally directed into the municipal sewage system in January.

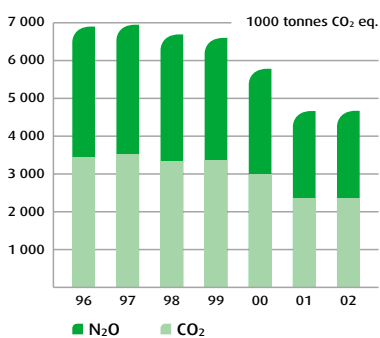
The Kokkola plants obtained a new permit for the sulphuric acid plant. The waste water permit for the whole site, issued in 2001, is pending due to appeals. A development project was started to close part of the waste disposal areas in 2004–2007.

The Kemira Fine Chemicals plant at the Kokkola site obtained ISO 14001 certification in September. The plant also installed a washing system for reducing VOC compounds from equipment maintenance. Environmental development projects included combustion experiments and studies of biodegradability and recycling of contaminated waste water.

Environmental load and net sales



Greenhouse gas emissions



**Paints and Coatings.** Logistic improvements in the paint business in Sweden, Finland and Poland were also beneficial to the environment. At the Lövholmen plant, changes in the equipment washing process minimized waste and product losses. The Vantaa site increased reuse of washing solvent and treatment of water-based waste and launched a programme for reducing occupational incidents.

In the UK, the Bury and West Bromwich sites carried out VOC monitoring and introduced comprehensive waste management plans. At Debica, Poland, soil and ground water studies were conducted to initiate a clean-up of areas contaminated mainly by oil and petroleum hydrocarbons from past production. The closing of production at Dordrecht, the Netherlands, includes limited remedial action.

**Agro.** The Uusikaupunki plant reduced environmental risks by investing in automation and logistic safety. Isolation of the process water basin was completed to prevent nitrogen leaching. The site was in good compliance with the recently tightened permit limits, although one leak of phosphorous water through the dike occurred. A voluntary energy efficiency study covered all major production processes.

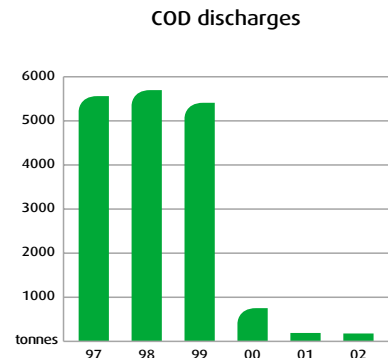
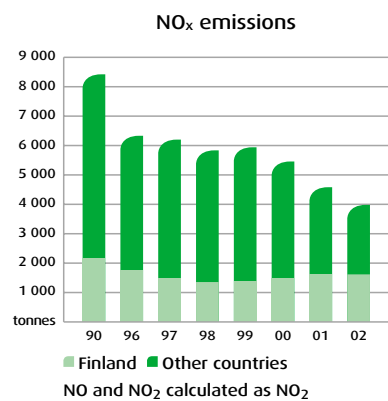
The Harjavalta plant expanded paving of the production areas and investigated soil contamination at the bagging unit. Preparatory work on the new integrated permit application included a review of the best available technologies and risks from gaseous leaks. The plant also got a good ISRS safety rating. At Kokkola, the feed phosphate plant obtained a new environmental permit as well as a certificate for good manufacturing practice (GMP).

The Siilinjärvi plant had record production levels in the phosphoric acid chain. Emissions into air diminished further, apart from sulphur dioxide due to equipment failure in the sulphuric acid plant. Discharges of phosphorus, nitrogen and trace metals were the lowest observed. The plant launched an environmental impact assessment project in connection with the planned expansion of mining and byproduct areas. Rehabilitation work proceeded in accordance with the long-term plans. A good rating was achieved in safety and environmental audits.

Production of the recently acquired Kynoch Feeds feed phosphate plant in Durban, South Africa, is based on clean phosphate raw material.

The Fredericia plant in Denmark reduced noise levels and the demand for cooling water. Completed soil investigations did not reveal significant contamination. Occasional dust releases and overshooting of permit limits were observed. The Ince plant in Chester, the UK, submitted a conditioning plan to the authorities concerning the small on-site landfill. Noise problems caused by a new heat exchanger are being tackled.

At Tertre, Belgium, the relocation and shutdown of nitric acid plants are resulting in substantially lower emissions of nitrogen oxides. The site obtained a very good safety rating, and it continued demolition work on old buildings. Closing and remedial activities took place at the smaller units in Belgium.



## Environmental business

Sales of environment-related products continued on a solid growth curve: up 8% on a comparable basis. These product groups, including environment-friendly paints and coatings for the first time, now amount to about EUR 526 million, or 20% of the Group's net sales.

About one half of these products are used directly for environmental protection purposes. Sales of water treatment chemicals increased by approximately 7% globally. Apart from growth in coagulants, Kemira expanded the range of water treatment services, for example, by establishing new partnership companies to combined chemical-biological water treatment and microbial gene testing instruments. Sales of catalytic converters dropped.

Environmentally benign products, existing on the market as an alternative to conventional products, contribute indirectly but significantly to environmental protection. In environmental chemicals, sales of hydrogen peroxide and certain speciality chemicals for the pulp and paper industry were relatively flat. Sodium percarbonate, an environmental alternative to borates in the detergent industry, boosted its sales due to successful capacity increases and favourable markets. Marketing of environmentally beneficial formic derivatives will be enhanced by an agreement with Arteco N.V., Belgium.

Within Paints and Coatings, sales of solvent-free, water-based applications now amount to as much as

approx. EUR 145 million. Tikkurila and Alcro-Beckers have formed the leading Nordic paint business in this area too.

Sales of products derived from waste or by-products, such as gypsum or ferrous sulphate, increased by up to one third. Growth could be observed in all applications. An investment of EUR 5 million will boost the production capacity of calcium sulphate pigment at Siilinjärvi to 100 000 tonnes per year.

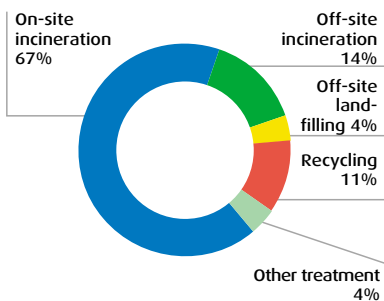
The biocontrol business was placed in a separate company, Verdera Oy, and partly spun off.

In addition to these developments, a substantial number of environmentally driven R&D efforts are going on. Just to mention a few of them, sustainable solutions for sludge treatment and nitrogen removal are being investigated in several water treatment projects. Photocatalytic properties of titanium dioxide may open new environmental applications for Kemira Pigments' speciality products. Kemira Agro has made innovations resulting in the iSeed™ concept for seed coating. It improves the plants' phosphorus uptake and cuts nutrient releases into the environment.

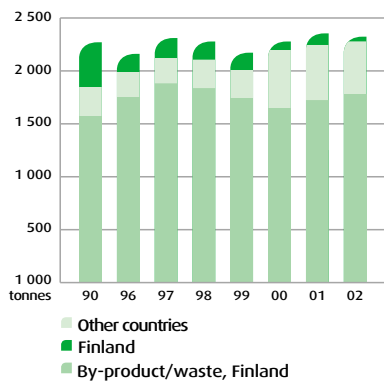
## Product safety

The discussion surrounding the EU White Paper on chemicals dominated the year in Europe. The first legislative proposals are expected in the first quarter of 2003. To anticipate forthcoming changes, Kemira is stepping up its participation in the chemical industry's voluntary ICCA HPV testing programme. Earlier changes in the reg-

Hazardous waste treatment in 2002



Non-hazardous waste generation



ulations on the environmental hazards of preparations caused a lot of extra pressure on the updating of material safety data sheets.

Kemira set up a global network of product safety experts based on the existing business units. The Group's product safety portal is being finalised as a networking tool that will support experts and help to share information worldwide.

There were no major product liability cases or issues concerning the environmental or health impacts of Kemira products. Public discussion on the health effects of acryl amide in food is not connected with Kemira's businesses. Recent food safety discussions and regulations, such as those concerning feed antibiotics or the BSE disease, have promoted Kemira's formic acid and feed phosphate businesses.

## Environmental statistics

The environmental data presented here has been compiled from 73 production plants globally. Thirteen small or medium-sized plants were reporting for the first time, including the eight sites of Kemira Chemicals Inc, USA. Otherwise the data is comparable with the figures for the previous year.

The overall production figures increased slightly mainly due to acquisitions and to plants reporting for the first time. Total energy consumption increased as well. A more detailed form of energy reporting guidance was introduced.

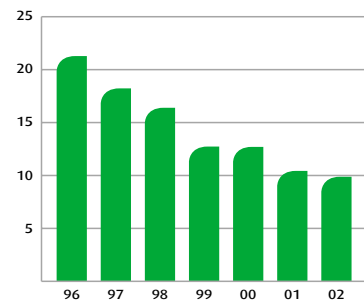
The volumes of waste water and cooling water were about 10% lower

than in 2001. Most releases into water also decreased slightly, apart from nitrogen, where a 5% increase came mainly from nitrogen fertilizer production.

The emissions into air remained at the levels of the previous year. Sulphur dioxide was up 7%, increasing mainly in sulphuric acid production. The 14% reduction in nitrogen dioxide was a result of improvements in nitric acid production in Belgium. Greenhouse gas releases were slightly higher due to increased energy production. VOC levels were unchanged on a comparable basis, with only minor increases from the US operations. New sources of VOCs were studied in ammonia production.

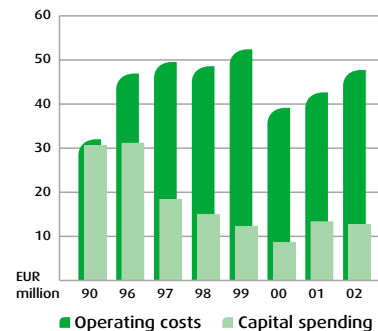
Non-hazardous waste generation was practically stable. On-site land-filling decreased somewhat thanks to recycling efforts, while off-site landfilling increased mainly in pigment production. The formation of hazardous wastes increased by about 24%. This occurred mainly in fine chemicals production, where on-site incineration also increased a similar amount. The recycling of spent alumina from hydrogen peroxide production also added to the reported figures.

## Lost-time incidents



Per million working hours at production sites. The 2002 figure includes large offices and research centres.

## Environmental capital spending and operating costs



### **Investments and operating costs**

Capital expenditures on environmental protection decreased somewhat, to EUR 12.3 million, or 5.0% of all investments. There were no major projects pending.

Environmental operating costs totaled EUR 47.3 million, up 11% on the previous year. The increase is attributable to general production and cost increases at many plants, to the acquisitions completed, as well as to a change in the accounting practice of one major site.

Environmental costs totaled about EUR 60 million, or 2.3% of consolidated net sales. In addition, environmental taxes and fees amounted to approximately EUR 10 million, down 7% on the previous year.

### **Safety and occupational health**

The overall safety performance of the Group did not change significantly. There were no major industrial accidents in 2002, and, as a result, Kemira's captive insurance company had the first recorded year without compensation payments. However, on 4 February 2003, a major roof fire on one production line of the titanium dioxide plant at Pori, Finland, caused property damage and partial production losses for about one week. The costs are covered by insurance.

One lethal accident occurred at the SIA Vivacolor paint plant in Riga, Latvia, on 19. November. One person died

when an expansion vessel of the water heating unit exploded. Kemira deeply regrets the loss of life.

The frequency of lost-time incidents (LTA) remained at the previous year level, 9.7 incidents per million working hours. The result is not satisfactory and tighter targets have been set to continue the downward trend. The reported LTA figures now include main offices and research centres.

Safety management and rating systems were developed at many sites (see above). Training of transport safety experts was enhanced due to major changes in the European legislation, and more safety efforts are being directed towards co-operation with transport companies.

Of the reported incidents, the following cases may have caused some local concern:

On 11 October, a truck of an external transport company carrying liquid SO<sub>2</sub> sold by Kemira Chemicals, Harjavalta, ran off the road close to the town. A leak of approximately 11 tonnes of sulphur dioxide did not cause significant harm to the public or the environment, but the road was closed and a regional alarm issued for a short period.

On 27 November, a leak of 25–30 m<sup>3</sup> of phosphoric acid was observed in the transfer pipeline at the Kokkola plants in Finland. The pumping was stopped, the leaked acid isolated and the contaminated soil removed without major environmental impacts.

**Environmental risks, liabilities and legal cases**

See the financial disclosure for this information (Notes to the Consolidated Financial Statements, Note 24).

**Corporate responsibility**

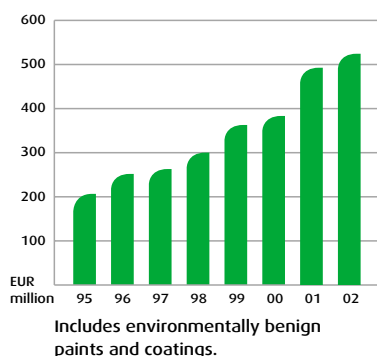
Kemira’s business principles (Code of Conduct) are now available on the intranet, as well as on our web site. The principles take into account the OECD guidelines for multinational companies. In what has become a tradition now, Kemira’s environmental report received a good rating in a comparison of annual reports in Finland.

Recent guidelines for sustainability reporting, including those of GRI, were reviewed with the aim of starting the development of selected social indicators. The safety and health of employees are already measured and managed systematically.

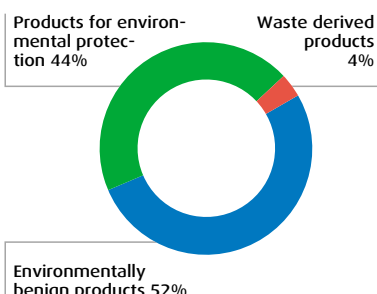
Social responsibility is also becoming part of our key customer interaction. Kemira will publish annual overviews of the role of key products in society, starting with water treatment (see page 18).

Kemira has an ongoing programme of donations to science and culture at the Group, SBU and site levels. Some forms of sponsorship are regular, such as grants for scientific research by the Kemira Foundation, maintaining a chemistry class for young students at the Espoo Research Centre, or our partnership with the Tapiola Sinfonietta orchestra in Espoo, Finland. In 2002, Kemira Chemie GmbH made specific

Growth of environmental business



Environment-related business 2002



donations to help those who suffered locally from the damage caused by the record flooding of the Danube in the Krems region.

Kemira Chemicals Brasil Ltda (KCBL) adopted a public elementary school in the very poor São Silvestre neighbourhood of Telemãco Borba. KCBL started construction of sanitary facilities for 400 pupils and helps the school in many other ways.

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# Environmental report

## Environmental and safety management systems at production sites in 2002

Site	Environment	Safety
<b>Chemicals</b>		
Oulu, Finland	ISO 14001 <sup>1</sup>	DNV ISRS <sup>2</sup>
Kokkola, Finland	ISO 14000	DNV ISRS
Pori, Finland	ISO 14001	DNV ISRS
Vaasa, Finland	ISO 14001	
Helsingborg, Sweden	ISO 14001	
Lauterbourg, France	ISO 14001	
Fredrikstad, Norway	ISO 14001	
Flix, Spain	ISO 14001, EMAS <sup>3</sup>	
Kvarntorp, Sweden	ISO 14001	
Krems, Austria	ISO 14001	
Swiecie, Poland	ISO 14001	Other
Ulsan, Korea	ISO 14001	Other
Esbjerg, Denmark	ISO 14001	
Prerov, Czech Republic	ISO 14001	Other
Police, Poland	ISO 14001	
Fine Chemicals, Kokkola, Finland	ISO 14001	DNV ISRS
Rheinberg, Germany	ISO 14001	
<b>Paints and Coatings</b>		
Vantaa, Finland	ISO 14001, EMAS	
Tallinn, Estonia	ISO 14001	
Riga, Latvia	ISO 14001	
Stockholm + Nykvarn, Sweden	ISO 14001	
<b>Agro</b>		
Uusikaupunki, Finland	ISO 14001	DNV ISRS
Harjavalta, Finland	ISO 14001	DNV ISRS
Siilinjärvi, Finland	ISO 14001	DNV ISRS
Ince, UK		DNV ISRS
Hull, UK	EMAS	
Tertre, Belgium	ISO 14001	DNV ISRS
Fredericia, Denmark	ISO 14001	DNV ISRS
<b>Metalkat</b>		
Laukaa, Finland	ISO 14001	

1) International Organization for Standardization, Environmental management systems.

2) Det Norske Veritas, International Safety Rating System.

3) European Union, Eco-Management and Audit Scheme.

## Environmental data for the Kemira Group

	1990	1999	2000	2001	2002
<b>Releases into water, tonnes</b>					
Chemical Oxygen Demand (COD) <sup>1</sup>	-	5,397	749	168	159
Nitrogen (N)	2,500	1,019	948	718	753
Phosphorus (P)	4,952	1,967	1,176	17	16
Suspended solids, 1,000 tonnes	934	773	403	1.2	0.9
Metals (Hg+Cd+Pb+Cr+As)	49	5.3	0.9	0.6	0.4
Metals (Hg+Cd+Pb+Cr+As+Cu+Ni+Zn)	-	66.8	6.8	3.7	2.8
<b>Releases into air, tonnes</b>					
Particulates	1,950	936	895	854	850
Sulphur dioxide (SO <sub>2</sub> ) <sup>2</sup>	23,138	5,687	4,359	4,272	4,580
Nitrogen oxides (NO <sub>x</sub> ) <sup>3</sup>	8,546	5,951	5,455	4,583	3,950
Carbon dioxide (CO <sub>2</sub> ), 1,000 tonnes	-	3,344	2,992	2,343	2,369
Volatile organics (VOC) <sup>4</sup>	-	321	298	240	235
Volatile inorganics (VIC) <sup>5</sup>	-	2,594	2,663	2,671	2,581
<b>Waste<sup>6</sup>, tonnes</b>					
Hazardous wastes, total	8,669	26,092	5,719	4,737	5,858
- Off-site landfill	-	19,479	518	1,103	1,038
- Off-site incineration	-	5,630	4,292	2,829	3,752
- On-site landfill	-	118	0	2	29
- Other treatment	-	864	909	803	1,040
Non-hazardous wastes, 1,000 tonnes	2,254	2,170	2,277	2,352	2,289
<b>Natural resources</b>					
Fuel consumption, ktoe <sup>7</sup>	-	1,773	1,571	1,160	542
Fuel consumption as raw material, ktoe	-	-	-	-	716
Purchased electricity, TJ	-	5,800	5,300	4,400	4,654
Total, ktoe	-	2,150	1,913	1,446	844
Cooling water volume, million m <sup>3</sup> , approx.	-	398	387	377	336
Waste water volume, million m <sup>3</sup> , approx.	-	76	34	16	15
<b>Safety</b>					
Number of accidents <sup>8</sup> per million working hours	-	12.7	12.7	10.4	9.7
<b>Reference data, EUR million</b>					
Group net sales	2,087	2,526	2,486	2,454	2,612
Environmental capital expenditure	31.1	12.6	8.9	13.5	12.3
Environmental operating costs	32.3	52.6	39.3	42.8	47.3
Total environmental costs, % of net sales	3.0	2.6	1.9	2.3	2.3

1) Estimate. In this case, mainly caused by inorganic discharges, and hence not a very relevant parameter for the Group.

2) All sulphur compounds calculated as SO<sub>2</sub>.

3) Nitric oxide and nitrogen dioxide calculated as NO<sub>x</sub>.

4) VOC is a sum of volatile organic compounds. Does not include all VOC sources in ammonia production.

5) Sum of ammonia, hydrogen chloride and six other simple inorganic compounds, mostly ammonia in this case.

6) Reported figures do not include mining by-products, on-site incineration, waste which is further processed into products at the sites, or sold as a co-product to external recycling. Figures are on wet basis.

7) 1,000 tonnes of oil equivalent. Includes fuel as a raw material in 1999-2001.

8) Accidents causing an employee absence of at least one day (LTA1).

Includes figures for production sites 1999-2001. 2002 also major offices and research centres.

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# Environmental report

## Assurance statement

At the request of Kemira Oyj, we have reviewed the information, systems and methodologies behind the environmental, health and safety data and statements presented in the Kemira Group Environmental Report 2002. The report is the responsibility of and has been approved by the Board of Directors of Kemira Oyj. The inherent limitations of completeness and the accuracy of the data are set out in the report.

Our review has consisted of the following procedures:

- making enquiries of management responsible for compiling the report;
- an examination of relevant supporting information;
- review in more detail of the systems for gathering and reporting environmental data at operating level at one site in Finland and one site in Poland, selected by us.

The report has been prepared in line with the CEFIC Health, Safety and Environmental Reporting Guidelines, excluding information on occupational illnesses and distribution incidents. Kemira complies, where appropriate, with the European Commission recommendation on the recognition, measurement and disclosure of environmental issues in the annual accounts and annual reports of companies (2001/453/EC).

Based on our activities undertaken, nothing has come to our attention that causes us to believe that the presented data and statements in the Kemira Group Environmental Report 2002 would not provide a fair and balanced view on the group's environmental, health and safety performance.

Helsinki, 13 February 2003

KPMG WIDERI OY AB

Hannu Niilekselä  
Authorized Public Accountant

Jari Tuomala  
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