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materials for a better life

Environmental Report 2005
Hoboken

Environmental Report 2005

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Dear neighbour

Welcome to the 7th edition of the Umicore Precious Metals Refining annual environmental report .The idea of this report is to provide you with information about the key environmental issues that arose over the past year.

What stood out in 2005?

- a sizeable decrease in emissions of lead, selenium and dust thanks to improved management of the Precious Metals Concentration installations
- a sharp decrease in sulphur dioxide emissions as a result of the installation of a double-absorption unit in the Sulphuric Acid plant
- a general improvement in air quality as regards metals in suspended and falling dust outside the plant
- lower dioxin levels once again
- submission – and in the meantime approval by OVAM (the Public Waste Agency of Flanders) – of the Moretusburg district soil remediation project
- the first phase of the noise-barrier was completed

At 7 pm on June 29th we will expand on this annual report at an information meeting. You will have ample opportunity there to ask questions. The meeting will be held at Café Gildenhuis, Kapelstraat 296, Hoboken. We hope to see you there.

You can call us at any time on 0800 93 739, e-mail us (jan.kegels@umicore.com) or simply write to us at Umicore, Department of Environmental Affairs, A. Greinerstraat 14, 2660 Hoboken.

You can also use the freephone number 0800 94 028 for questions about the soil remediation project and/or visit the website www.schoonmoretusburghertogvelden.be.

Hugo Morel
Executive Vice-President

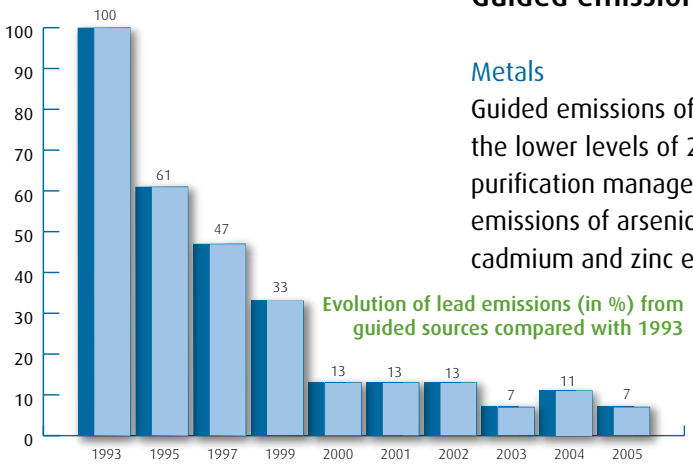
AIR

Emissions

'Major investments to dramatically cut SO_2 emissions''

By emissions we mean quantities of dust or gas that are released into the atmosphere in one way or another. Guided emissions are dust and gases that are given out by chimneys. All other emissions are diffuse emissions, such as dust or gas from buildings, or dust that is blown about during shipping, storage or transportation of raw materials.

Guided emissions



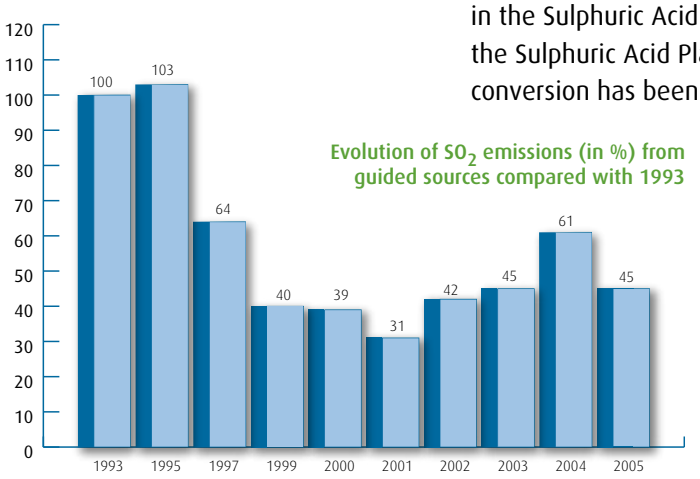
Evolution of lead emissions (in %) from guided sources compared with 1993

Metals

Guided emissions of lead and selenium decreased in 2005 and are back to the lower levels of 2003. This reduction was mainly the result of better gas purification management by the Precious Metals Concentration Plant. Guided emissions of arsenic are at levels comparable with previous years. Copper, nickel, cadmium and zinc emissions have increased due to emissions of hygiene gases by the Smelter over a brief period in the spring. Combined with the high gas output of this emission point, these emissions, although well within legal norms, led to a rise in the guided load of these elements in 2005 compared with previous years. Shortly after detection, the entire filter was overhauled and all filter sleeves replaced. Emissions from this stack have since returned to normal.

SO_2

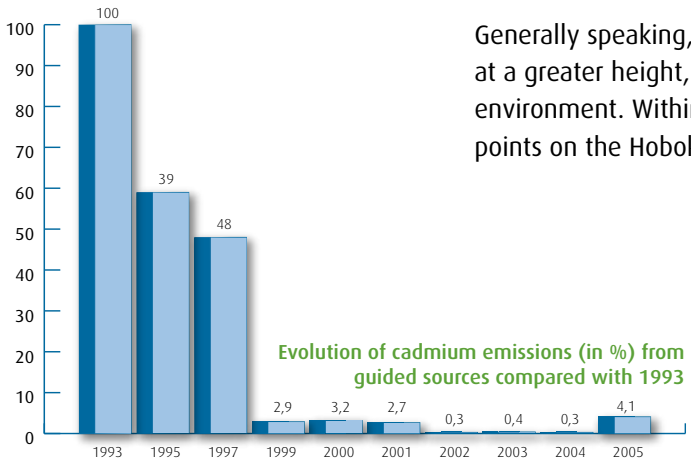
The sulphur dioxide (SO_2) produced in the Smelter is converted into sulphuric acid in the Sulphuric Acid Plant. The investment made, which involved converting the Sulphuric Acid Plant from single to double absorption, has ensured that this conversion has been made even more efficient. As a result, less SO_2 is released into the atmosphere through residual gases. The total cost of this investment is around EUR 9 million and it is leading to a sizeable decrease in SO_2 emissions, as the graph shows. Where as discharged residual gases previously contained SO_2 concentrations of around 1,500 mg/Nm^3, they now contain only around 200 mg/Nm^3.



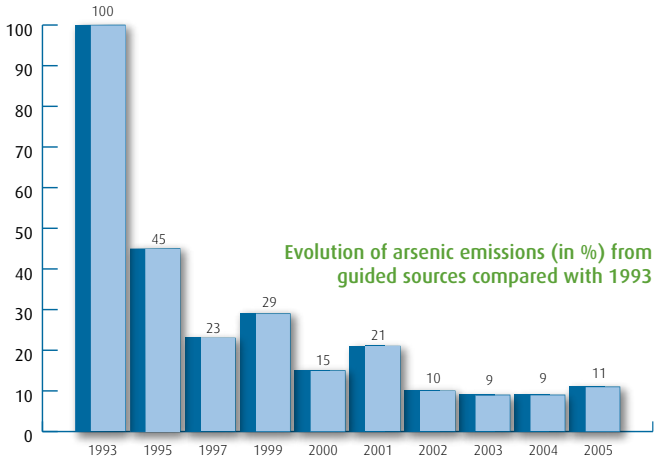
Evolution of SO_2 emissions (in %) from guided sources compared with 1993

In 2005 alone, this resulted in a drop in SO_2 emissions for the entire site, despite the installation only becoming fully operational in November.

Generally speaking, it can be said that, given that all guided emissions occur at a greater height, they will have only a minor influence on the immediate environment. Within the framework of the legislation, a total of 41 emission points on the Hoboken site are regularly measured and checked.



Evolution of cadmium emissions (in %) from guided sources compared with 1993

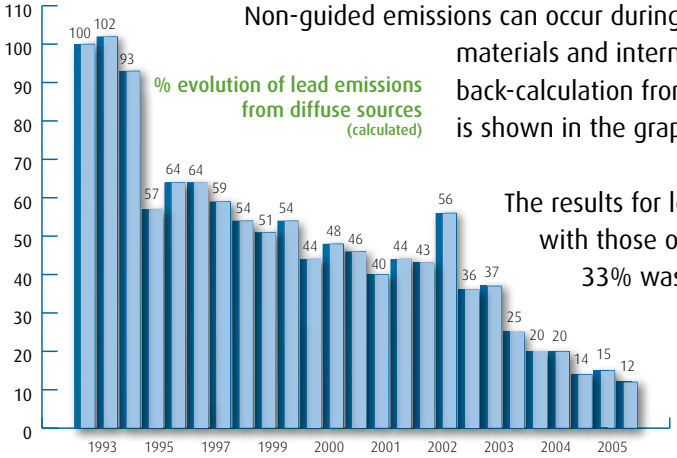


Evolution of arsenic emissions (in %) from guided sources compared with 1993

View of a number of stacks at the plant

View of the fog cannon in operation: through creation of a fine fog, any dust that is whipped up is settled at source.

Diffuse emissions



Non-guided emissions can occur during the transport and shipment of raw materials and intermediate products. They are estimated by back-calculation from immission results. The evolution for lead is shown in the graph.

The results for lead, cadmium, zinc and copper are in line with those of 2004. For arsenic, a sharp decrease of 33% was noted compared with 2004.

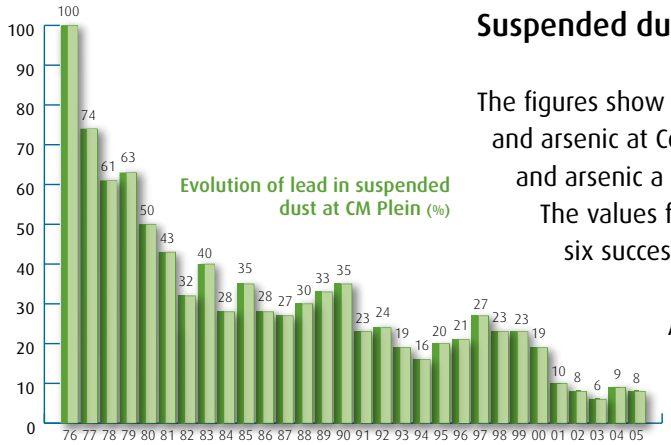
In 2005, a study was also carried out to identify the major sources of diffuse emissions. Following the conclusions of this study, it was decided, among other things, to install wind guards on the boxes in the zone around the Crushing Plant. These guards break the wind speed and are designed to severely limit dust from this zone blowing about. Tests were also carried out with a fog cannon which can be deployed on an ad hoc basis to combat diffuse emissions when dusty materials are being handled.

A member of the Environment section team carrying out immission measurements on the roof of the school in the Moretusburg District.

Immissions

'A further decrease in metals and dioxins from falling dust'

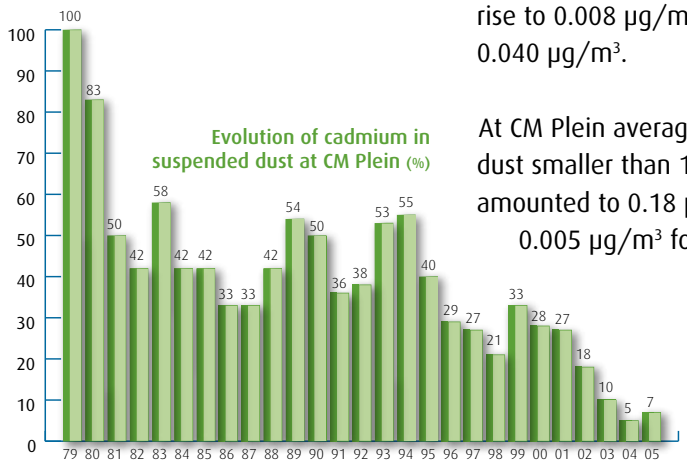
By immissions we mean those quantities of dust that are present in the environment, such as dust suspended in the air and falling, coarser dust that lands on the ground.



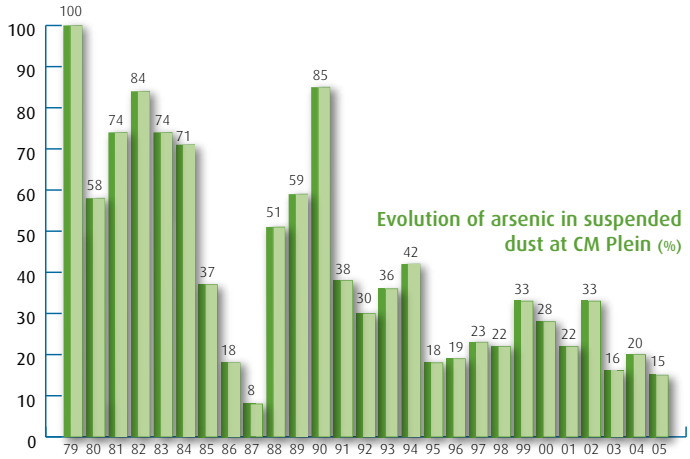
Suspended dust

The figures show the percentage evolution of lead, cadmium and arsenic at Constantin Meunierplein (CM Plein). For lead and arsenic a decrease can be seen compared with 2004. The values for cadmium have increased slightly after six successive years of decrease.

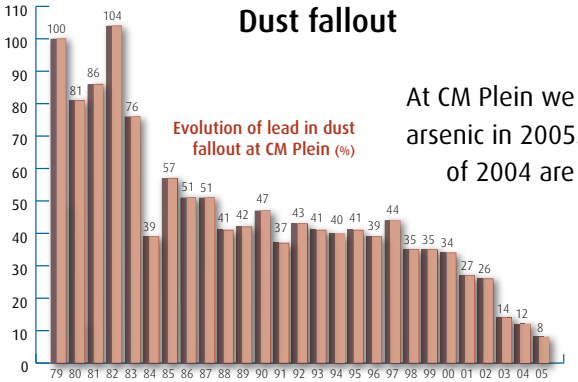
At CM Plein we have dropped to 0.31 µg lead/m³ as an annual average; this is also the case for arsenic (annual average = 0.058 µg/m³; no norm). For cadmium the measured concentrations rise to 0.008 µg/m3 but we are still way below the norm of 0.040 µg/m³.



At CM Plein average concentrations in PM-10 dust – this is dust smaller than 10 µm (one hundredth of a millimetre) amounted to 0.18 µg/m³ for lead (norm = 0.5 µg/m³), 0.005 µg/m³ for cadmium and 0.053 µg/m³ for arsenic.

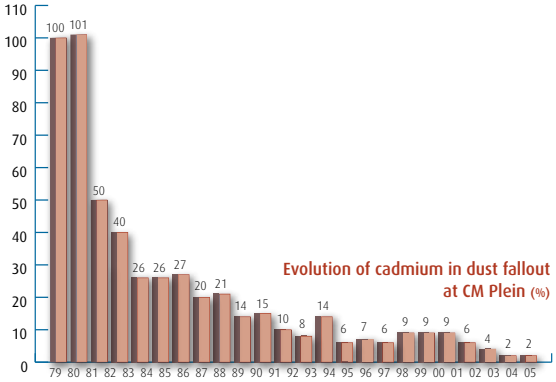


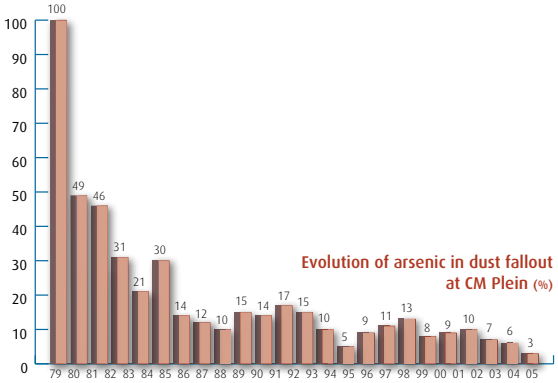
Dust fallout



At CM Plein we can see a further drop in the fallout of lead and arsenic in 2005. For cadmium, concentrations comparable to those of 2004 are noted. Values are expressed in mg/m2.day:

- lead : 0.67
- cadmium : 0,009
- arsenic : 0,06





Dioxins

Levels above 26 pg TEQ/m².day are described by the VMM (Flemish Environmental Agency) as “elevated”, those between 6 and 26 as “moderately elevated” and those below 6 as “non-elevated”.

As the measured values show, the downward trend continued in 2005. The monthly measurements carried out by the government (VMM) and Umicore even show that starting in the second half of the year, most concentrations measured were at a level below or around 6 pg TEQ/m².day and can therefore be classified as “non-elevated”. Nevertheless, Umicore will continue to carry out intensive control measurements of dioxin fallout and emissions to be able to act quickly should an elevated value be recorded.

Year	pg TEQ/m².day
2000	37
2001	28
2002	14
2003	22
2004	12
2005	7

This table shows the evolution of the annual average

- pg = picogram = 0,000000000001 gram
- TEQ = Toxicity Equivalent = a way of expressing the 17 most toxic dioxins and dibenzofurans as one number

WATER

'Once again, a solid performance by the Water Treatment Plant in 2005'

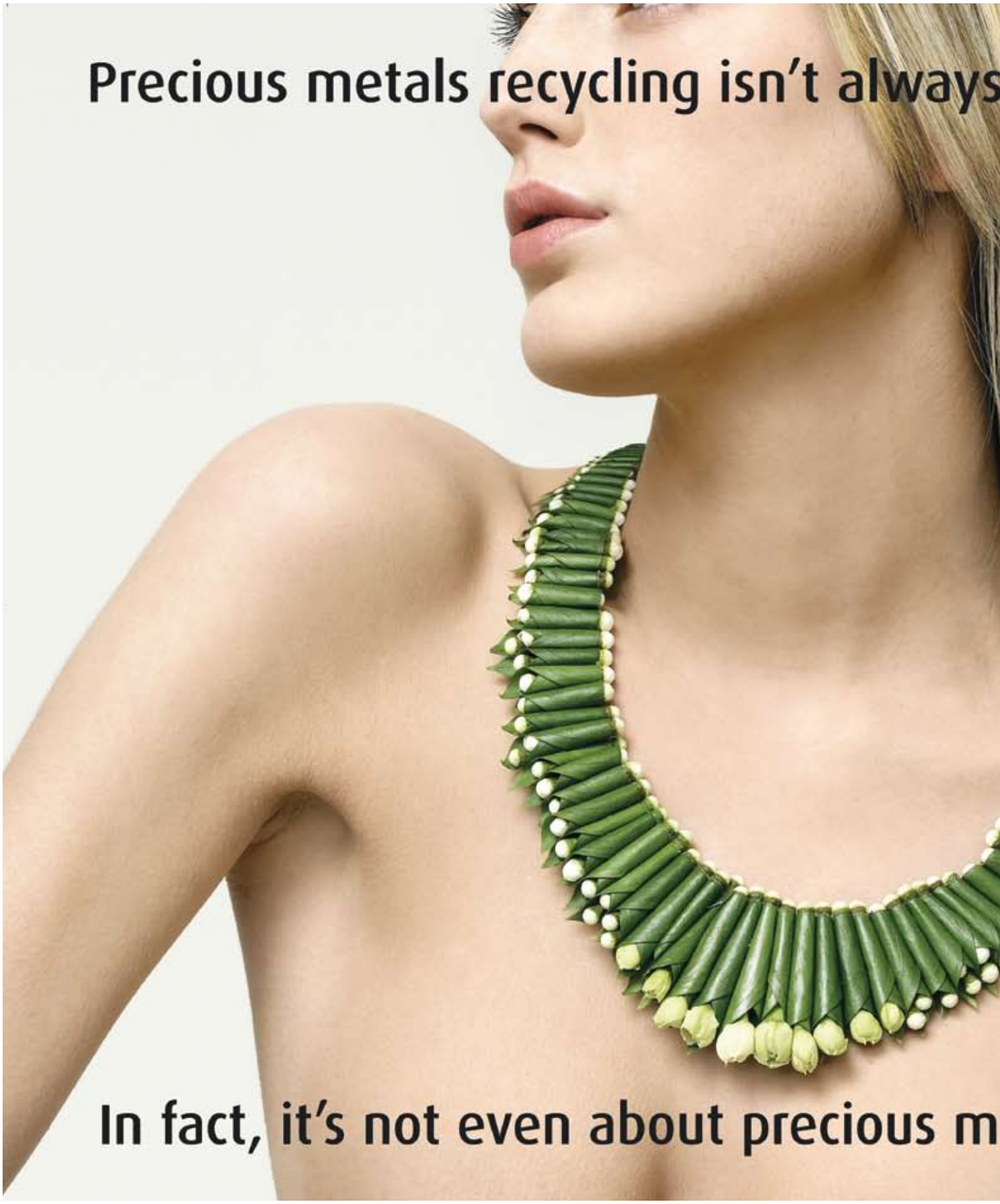
2005 was yet another year of good results. By checking water quality ourselves at least three times a day against the main parameters in the Water Treatment Plant we can, if necessary, intervene in the process in good time, thereby preventing the norms from being exceeded. The evolution of concentrations is shown in the table below. 2005 was also characterised by a number of important and necessary replacement investments in certain parts of the installation after 25 years of faithful service. The Research Department is also involved in continuing to look for new, alternative treatment techniques to allow us to increase treatment efficiency even further in the future on certain parameters.

Concentrations mg/l	norm	2002	2003	2004	2005
lead	1	0.02	0.05	0.04	0.03
cadmium	0.2	0.013	0.027	0.014	0.013
arsenic	1	0.18	0.15	0.18	0.18
copper	3	0.01	0.10	0.22	0.19
selenium	5	1.7	1.7	2.8	2.3
nitrogen	125	53	39	46	44

Control samples taken by the government: the environmental inspectorate is authorised to check that the Water Treatment Plant is operating as per its licence at any time by taking samples. In practice, this is done several times a year.

Atomic absorption measuring equipment is used to control the efficient operation of the treatment process at least 3 times a day

Communication in press and trade journ



als

Umicore Hoboken is working on its reputation as a processor of materials containing precious metals such as electronic scrap, catalytic converters from vehicles and industrial catalysts. This advertisement and others will appear in the press and in specialist trade journals.

Remediation projects

'Work in Moretusburg will begin in September 2006'.

Plant

A large part of the excavation and covering of our sites has already been carried out over previous years. This prevents contaminated soil from drying out and blowing around. Storage depots were provided with a concrete floor that is connected to the internal factory drainage system so rainwater and sprinkling water are taken to our Water Treatment Plant. These techniques will also be used in the future on a site of approx. 6 ha that is yet to be given remediation treatment.

Tests will be carried out in 2006 on an alternative technique for groundwater remediation: instead of working with classic drainage, we will attempt to draw off the groundwater using vacuum pumps. The groundwater pumped up will then be taken to our Water Treatment Plant.

The level of pollution in the groundwater will again be determined. This should put us in a position to draft the final report and submit it to the authorities (OVAM). This is planned for the summer of 2006.

Installation of the groundwater draw-off filters in preparation for the test.

Moretusburg District

The soil remediation project was drawn up, submitted to OVAM and approved on February 27th , 2006. Work will begin on September 4th, 2006 and, if everything goes to plan, will be completed by the end of 2007. The contaminated soil will be excavated to a depth of 30 cm and replaced by leaf mould on all plots and on all sections of public land in the district. Grass will then be sown or turf laid, fences and hedges that have been removed will be replaced and everything put back in order.

All dust-rich places in houses will then be dedusted by a specialised firm.

A great deal of work still has to be completed before we can start:

- a contractor and dedusting firm have to be appointed
- all residents will receive a visit from a soil remediation expert who will draw up an individual agreement with an accurate description of all the work on the plot in question
- a surveyor will measure ground levels on each plot and produce a report on the state of the garden and outbuildings. An estimate will also be made of the value of the greenery to be removed. The resident will receive a compensation payment based on this.

The remediation will be carried out block by block. Before work begins, a further information meeting will be organised for each block, at which all residents will again be given a detailed explanation of what the work will involve for their block.

Hertogvelden

Whenever historic contamination is uncovered, a risk study must be carried out. For the district of Hertogvelden (area between Kapelstraat and L. de Landrelaan) this study is proving to require more time than envisaged, which means it has not yet officially been submitted to OVAM. As soon as the declaration of conformity is in our possession, the residents of the plots concerned will receive detailed information on the findings and any further steps required.

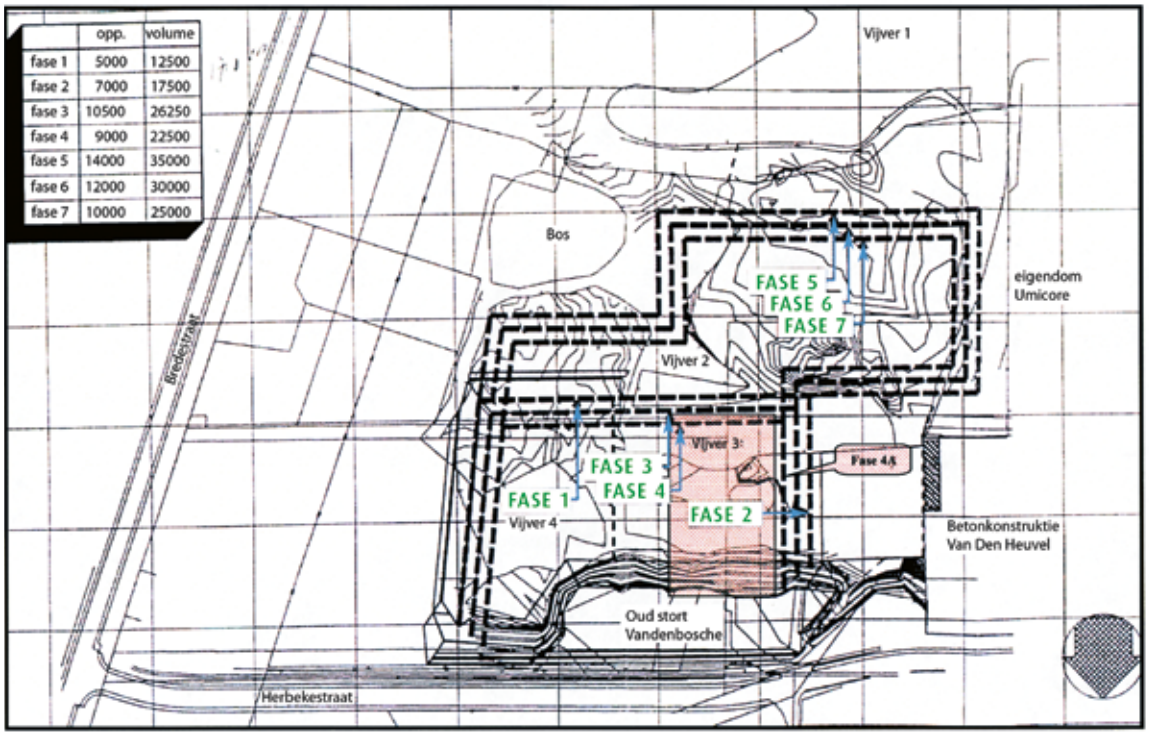
The latest information on the Moretusburg and Hertogvelden projects can always be found on notice-boards.

Class-1 waste disposal site

'Installation of a final covering of phase 4A of the Class-1 Dump at Hemiksem'.

Since October 1988, Umicore has operated a class-1 waste disposal site at Hemiksem, situated on Herbekestraat at a distance of around 150 m from Bredestraat. Neutralised slurry from the Water Treatment Plant is taken to this site. The site is favourably situated because of the underlying Boom clay layer (impenetrable layer from 1.7 m to 48.5 m in depth). This layer of clay provides extremely efficient protection of the groundwater against the possible effects of the dump. The actual area used for dumping is 26,000 m2. The site is divided into 7 phases (see figure). The total waste disposal capacity is around 321,500 ton.

Diagram of the waste disposal sites.



	opp.	volume
fase 1	5000	12500
fase 2	7000	17500
fase 3	10500	26250
fase 4	9000	22500
fase 5	14000	35000
fase 6	12000	30000
fase 7	10000	25000

Phases 1, 2, 3 and part of phase 4A are full, while phase 4B is still in use. The final covering of phase 4A with an area of 4,225 m² had to be carried out before 31/12/2005 in accordance with statutory provisions. The work was completed in October 2005. The final covering concept consists of a sealing layer with a final covering on top. The sealing layer consists of a homogeneous layer of fairly impermeable soil material covered by a synthetic cover of HDPE sheets that have been welded together. The final covering layer was placed on top of the sealing layer. The final covering layer consists of a draining layer with drainage tubes for

Installation of the final covering of phase 4A at the dump took place in accordance with applicable legislation, once the closure plan had been approved by the competent authority.

carrying rainwater away. A rooting layer (leaf mould) was placed on top of the draining layer and sown with grass.

Waste

Until 2005, the residue created in the Smelter's gas purifier was removed in a controlled fashion and deposited at a suitably licensed external waste disposal site. In conjunction with the Research Department, the Special Metals Department has developed a process that allows us to recover and upgrade the selenium from this residue. As a result, it no longer has to be dumped. In 2005, 457 ton of this historically dumped residue were even brought back from the external waste disposal site for further processing in the installations at Hoboken.

Leaf mould was placed on top of the impermeable sheeting and sown with grass.

Noise-barrier

'The first phase is complete'

Work on the first phase of the noise-barrier was completed at the end of 2005. In concrete terms, this means that a large U-shaped dam approximately 8 m high was constructed with poor blast-furnace slag. In a second phase this 'U' will then be filled with contaminated soil from the soil remediation works in Moretusburg and in the plant.

The dam rests on 472 piles that were driven into the ground to absorb the enormous pressure. A drain was then built, which filters rainwater through the dam during the work, collects it and takes it to our Water Treatment Plant. A vertical screen reaching as far as the clay layer ensures that no contaminated groundwater can penetrate the surrounding land.

The dam that has now been created is covered with a sheet on top of which a 20 cm layer of leaf mould was placed. This was sown with grass, broom and Aaron's rod, which will give the structure a green appearance.

Work will continue in 2007, when sufficient soil is available. The final covering is planned for early 2009 at the latest, when the sites within the plant will also have undergone full remediation.

The 'green' appearance of the dam is achieved by covering the dam with a layer of leaf mould and sowing this with grass.

Energy

'The objectives for 2005 were easily achieved'

Umicore signed a covenant with the Flemish Government to ensure that our installations remain among the best in the world in terms of efficient use of energy.
To this end, the company was audited by an expert with whom we drew up a programme of improvements.

In the past a great deal of attention was devoted to energy recovery: for example, heat from the Blast-Furnace process gases is used to pre-heat the air that is blown into the furnace to 600ºC. The heat of the combustion gases from the Lead Refinery stoking installation is used to generate steam. The Smelter was also fitted with a boiler which generates steam at high pressure for internal use with the heat from the process gases. These two steam recovery boilers save a great deal of natural gas in the power plant responsible for supplying power to the company: more than 50% of the steam used is now recovery steam!

The power efficiency of the Electrowinning has been significantly improved.

Meanwhile, new improvements have been made:

- even more heat is recovered from the Blast-Furnace process gases to heat the acid in Electrowinning
- we can now supply more extra-pure water to the Smelter steam boiler, which means we can generate even more steam
- the power efficiency of Electrowinning has been significantly improved
- the Stoking House was fitted with a new burner which can be completely shut down if the Smelter is providing enough steam.

This is just a small selection from a whole series of projects that have already been implemented.

MISCELLANEOUS

Environmental investments

'Environmental expenditure came to around EUR 8.1 million.'

In 2005, environmental expenditure came to around EUR 8.1 million, 3.7 million of which was spent on environment-related investment projects.
The most important of these were:

- rebuilding of the sulphuric acid installation with double absorption, resulting in a significant reduction in SO_2 emissions;
- construction of phase 1 of the noise-barrier to a height of around 8 m;
- replacement of the Smelter hygiene gas purification installation's filter sleeves;
- restoration of storage boxes around the Crushing Plant, including installation of a water spraying system;
- installation of a final covering on part of the class-1 waste disposal site at Hemiksem.

ISO14001 certification...

... according to a new version of the environmental standard

CERTIFICAAT

Hiermede wordt verklaard dat het milieumanagementsysteem van:

Umicore, site Hoboken
Hoboken, België

door Lloyd's Register Quality Assurance is geïmplementeerd en goedgekeurd volgens de volgende milieumanagementnorm:

NBN EN ISO 14001 : 2004

Het milieumanagementsysteem is van toepassing op:

Verwerking van een breede waaier complexe materialen die edele metalen en andere non-ferrometalen bevatten, conform de geldende milieuregelgeving en met inschakeling van de belangen van relevante belanghebbenden. Het toepassingsgebied van dit certificaat omvat alle activiteiten gevestigd te Hoboken, de ontwikkeling en het gebruik van milieuvriendelijke processen, het aankopen van de grondstoffen, de verkoop van eindproducten en het verwerkbaar transport binnen voorzien in het betreffende contract.

Certificaat no.: 936438.2 Datum van uitgifte eerste certificaat: 7 april 2004

Datum van uitgifte verlenging: 30 september 2005

Vervaldatum: 7 april 2007

Afgegeven door: LRQA (België)

Zie de document zijn de aan verantwoordelijk verwarvaardige van toepassing

Ga naar www.lrqa.com

Since April 2004, Umicore Hoboken has been certified ISO 14001 for its environmental care system. At the end of 2004, a new version of this standard appeared which, in particular, placed stricter requirements on working with contractors and self-assessment of compliance with statutory and other requirements.

During the follow-up audit by Lloyd's, in September 2005, Umicore Hoboken presented its changes, which were positively assessed.

Our environmental care system is now therefore certified to version 14001:2004 of the ISO standard.

Sustainable Development Open Days

'One or two atmospheric images of the open days in October 2005'

Umicore Hoboken took up an invitation by the State Secretary for Sustainable Development to take part in the sustainable development open days on October 22nd and 23rd, 2005.

We had the pleasure of welcoming many of you on these open days, when we had the chance to show you personally how Umicore Hoboken is contributing to sustainable development by recycling waste containing precious metals and through integrated environmental care.

The general public was also able to visit the new Leaching & Electrowinning Plant for the first time.

View of the new "double absorption" section of the Sulphuric Acid plant

Complaints, questions, comments, ... ?

Please call us on the freephone number 0800 93739.
Operators are on hand round the clock to take your call. We will try to answer you as quickly as possible.
For questions relating to the Moretusburg-Hertogvelden soil remediation projects, please call us on the freephone number 0800 94028.

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