

2009 SUSTAINABLE DEVELOPMENT REPORT
managing today to prepare for tomorrow





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Andra

the French National Radioactive Waste Management Agency



– Who are we? –

Andra is a public body with industrial and commercial activities set up by the Act of 30 December 1991. It was assigned further responsibilities under the Planning Act of 28 June 2006 on the sustainable management of radioactive materials and waste. Andra is independent of radioactive waste producers and supervised by the French Ministries of Energy, the Environment and Research.

– What do we do? –

Andra is responsible for the sustainable management of radioactive waste in France. It provides the Government with expertise and know-how to find, implement and guarantee safe solutions aimed at ensuring short- and long-term protection of human health and the environment against the impact of this waste.

Andra's definition of sustainable development:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

[1987 – Ms. Gro Harlem Brundtland, Norwegian Prime Minister]



Radiological and chemical monitoring of the environment around Andra's facilities shows that the impact is significantly lower than that of naturally-occurring radioactivity.

editorial

SUSTAINABLE DEVELOPMENT AT THE HEART OF ANDRA'S WORK

Sustainable development is the reason for Andra's existence.

All the activities undertaken by the Agency in fulfilling its role, whether part of its core business or a wider approach, are firmly rooted in its sustainable development strategy. The purpose of this report is to present these various activities.

Ensuring the safety of its facilities is a permanent focus in the Agency's work. This involves in-depth inspection and examination of waste packages, studies to optimise the space required for disposal, monitoring the effects on human health and the environment, and ensuring that information about facilities is stored and passed on to future generations. These essential activities illustrate Andra's sense of social responsibility.

Fostering constructive dialogue with all interested parties has been another key focus in 2009. Not only is this dialogue a key commitment for Andra, but it also demonstrates our desire to work with the whole of society in openness and transparency. Who better than local stakeholders to express the needs and expectations of local people with regard to the location of the planned deep geological repository for high-level waste and intermediate-level long-lived waste? These regular and intensive discussions, with the Local Information and Oversight Committee for the Underground Research Laboratory, elected representatives, residents and associations, and also with the wider scientific community, are helping Andra move forward in designing a safe and reversible disposal facility.

Finally, 2009 also saw Andra implementing many other actions related to the three pillars of sustainable development (environment, society and the economy), with particular efforts to **reduce its environmental footprint, conserve biodiversity** or **contribute to economic development in the areas** around its facilities, through job creation, education and training, and involvement with local voluntary organisations and cultural life.



Patrick Charton
SUSTAINABLE DEVELOPMENT OFFICER, ANDRA

Article 6 of the French Charter for the Environment
“Public policy must promote sustainable development. To this end, it must combine environmental protection, economic development and social progress.”



March

- Progress meeting for the deep geological repository project with local councillors and Members of Parliament from the Haute-Marne district.



at a glance
main events at Andra in 2009



April

- The CSFMA low- and intermediate-level waste disposal facility hosted an exhibition on swallows.



June

- Andra organised a multidisciplinary conference on reversibility from 17 to 19 June 2009, at the *Palais des congrès* in Nancy, attended by around 100 delegates.



August

- Environmental sampling operations take place regularly around our facilities. In this picture, a water sample is being taken in the Sainte-Hélène brook near the CSM waste disposal facility (Manche district).



September

- Children visit the clay exhibition at the Open Day at the CSTFA very-low-level waste disposal facility.



September

- Andra organised the first ever Open Day in the drifts of its Underground Research Laboratory, 490 metres below ground level.



Sustainable development is a daily reality

What tangible action took place in 2009?
Andra's sustainable development management team report.



Jean-Philippe MOURONVAL

— MANAGER OF
QUALITY & ENVIRONMENT
AT THE MEUSE/Haute-MARNE CENTRE

"Following the energy survey carried out in 2008 and 2009, energy savings were achieved on our site in 2009 by optimising our heating guidelines for the tertiary buildings, installing presence sensors in the toilets and corridors of new buildings and by replacing electric convector heaters with heat pumps. Further measures are planned for 2010."

Alain DELAPLANCHE

— MANAGER OF
QUALITY, SAFETY & ENVIRONMENT
AT THE CSFMA AND CSTFA WASTE DISPOSAL FACILITIES

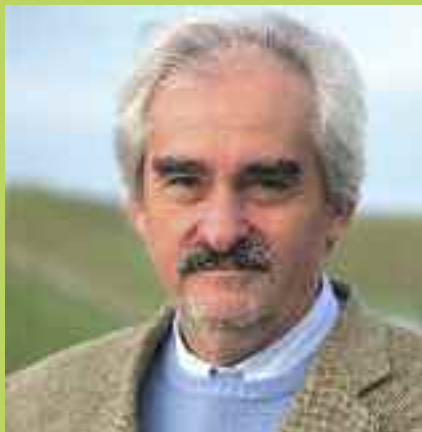
"We saved water by using a leak detection system and installing water meters in each building or zone at the CSFMA and CSTFA waste disposal facilities."



Jean-Pierre VERVIALLE

— DIRECTOR OF THE CSM WASTE DISPOSAL FACILITY

"We upgraded our vehicle fleet, deliberately selecting low-emissions models. In addition, we have started to reuse our shredded paper for padding to protect the samples that are taken at the facility and sent off to the laboratory for radiological analysis."





Andra worked hard in 2009 to reduce the carbon footprint of each employee's activities and the organisation's overall energy consumption, by improving lighting and heating systems, upgrading its vehicle fleet and encouraging people to adopt video-conferencing and car-sharing.

REDUCING THE ENVIRONMENTAL FOOTPRINT OF OUR ACTIVITIES



— In 2009, Andra continued working to reduce energy consumption in its various facilities. At the Agency's head office in Châtenay-Malabry and at the CSFMA low- and intermediate-level waste disposal facility in north-eastern France, the lighting systems have been fitted with presence detectors. At the Meuse/Haute-Marne Centre, the heating systems have been upgraded to lower the temperature when no one is in the offices and by the end of 2010, halogen lighting will have been entirely replaced by low-energy bulbs, as at the Agency's head office and at the CSFMA & CSTFA waste disposal facilities. The Bilan Carbone® (carbon review) carried out in 2008 on Andra's activities highlighted that the main sources of greenhouse gas emissions were the transportation of waste packages and the use of steel and cement for waste disposal. Given the nature of Andra's work, the potential for improvement in these areas is limited. In its 2009 action plan, the Agency therefore focused its attention on other factors, in particular on employee transport and travel. Andra continued to upgrade its vehicle fleet in 2009, by leasing or purchasing 18 cars with CO₂ emissions less than or equal to 120 g/km. Andra also updated its inter-site video-conferencing equipment in order to reduce the need for work-related travel. Car-sharing schemes have

also been developed for people commuting to the Meuse/Haute-Marne Centre. In 2010, Andra will be reviewing all flights taken by its staff, in particular when travelling abroad, in order to set up a carbon offsetting scheme by 2012.

REDUCING OUR ECOLOGICAL FOOTPRINT

— Andra's industrial activities involve too many complex factors (construction and maintenance materials, staff transport, waste package transportation, disposal life cycle etc.) for the environmental footprints of each facility to be calculated in an accurate, relevant and comprehensible way. However, one of the most significant factors for the environmental impact of waste disposal is well-known – the inflow of materials to the disposal facilities (concrete, metal, sand and waste packages). Transportation of these items and the outgoing flows also make a large contribution. In 2009, Andra launched a process to find better ways to manage these material flows. All materials used to build and operate a disposal facility were listed in order to analyse the variation in the environmental impact of material flows according to volume, geographical origin or transport method.



Did you know?

"GREEN" INCENTIVE SCHEME

— 10% of Andra's staff incentives are tied to the Agency's performance in terms of sustainable development, measured in terms of two criteria - a 10% year-on-year reduction in electricity consumption and in paper usage. These targets were not met in 2009.





— The Agency has also looked into ways of reducing raw material transportation by sourcing materials from as close as possible to its waste disposal facilities. In the proposals for the location of the future deep repository, it has included criteria relating to possibility of the rail transportation of construction materials. Plans to use very-low-level waste metals when building disposal structures at existing facilities will, in the long run, provide a further way of limiting the environmental impact of these facilities by reducing the demand for new materials.

IMPROVING WASTE MANAGEMENT

— During the European Week for Waste Reduction in late November 2009, staff from Andra and its contractors took part in a competition relating to this topic. The aim was to collect as many original ideas for waste management and decide which of them could be implemented at the Agency’s sites. Prize-winning ideas from the CSFMA and CSTFA disposal facilities in north-eastern France included composting food waste and lawnmower clippings.

At the Underground Research Laboratory, ideas focused on the headlamps used, with an initiative to replace the disposable batteries with rechargeable ones. In 2010, one idea from the competition will be implemented, when all Andra staff receive a personal mug, manufactured from recycled plastic from computer screens. The mugs will replace the plastic disposable cups that are currently used at our water coolers.

The CSFMA and CSTFA waste disposal facilities worked on reducing the amount of printed paper that was shredded, because the strips of shredded paper are too small to be recycled.



**16% less
CO₂ emitted**



Did you know?

**“GREENER”
PRINTING**

In August 2009, new copiers were installed at the Agency’s head office in Châtenay-Malabry. The production of these printers from maize-husk bioplastic generates 16% less CO₂ than conventional plastics. The power consumption is half of that of a standard photocopier.



Action!

2009 SUSTAINABLE DEVELOPMENT WEEK

— In April, Andra marked Sustainable Development Week by encouraging employees to adopt environmentally-friendly behaviour, such as using green energy sources, turning off electrical equipment after work, car sharing or calculating their personal environmental footprint.



Reducing the transportation of materials used to build disposal facilities (CSFMA facility pictured) is one idea that Andra is looking into in order to reduce its environmental impact.



LOOKING AHEAD

to improve radioactive waste management

Andra's staff are working hard on various projects to improve radioactive waste disposal conditions. The goals are to optimise the use of space at disposal facilities, ensure that deep geological disposal remains reversible for at least a hundred years and use innovative methods of preserving the memory of facilities.

These challenges are described below, and will require research, innovation, industrial prowess and openness to ensure that waste disposal facilities remain safe now and for future generations.

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+ Ensuring that HLW and ILW-LL disposal is reversible **p.12**

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In 2009, Andra launched two major projects for reducing waste volumes – recycling some waste items within the nuclear industry and implementing a more incentive-based billing system.

SAVING SPACE

— In 2009, 31,024 cubic metres of waste packages were delivered to the CSTFA very-low-level waste disposal facility in north-eastern France compared with 28,458 cubic metres the previous year. This increase in volume, in line with the needs of waste producers, was chiefly due to the dismantling of former nuclear facilities, such as the AREVA NC spent fuel reprocessing plant at Marcoule. Dismantling work planned for the next few years at various nuclear sites will continue to produce large volumes of very-low-level waste. Andra has implemented various strategies to save space at disposal facilities to ensure that France’s industry remains at the cutting edge of nuclear technology in the world.

REDUCING WASTE VOLUME

— The renewal of the contract between the Agency and radioactive waste producers for the operation of the CSTFA facility, has enabled a new, more incentive-based billing system to be introduced to pay for the industrial services provided by the Agency. The volume of waste packages delivered is now taken into account, rather than the weight alone. These changes will mean that it will be cheaper for waste producers to deliver denser packages, which will take up less disposal space.

The new billing system should also encourage waste producers to use the compacting presses in the facility to reduce the volume of waste for disposal.

RE-USING SOME METAL WASTE

— Another major step forward in 2009 was the idea of recycling some very-low-level metal waste from the dismantling of French nuclear facilities for use within the nuclear sector. In a report addressed to the French President in late 2009, it was proposed that Andra be allocated €100 million from the forthcoming government bond issue in order to invest in future innovations for the processing of radioactive waste.

A proportion of this sum will be used to develop industrial recycling strategies.

Andra will continue with the studies that have been ongoing since 2007, looking into the way in which these metals could be recycled. Once they have been melted down, they could be used, for instance, to manufacture radioactive waste containers or rebars for reinforcing the concrete used in the construction of disposal facilities. The project could take in up to 10,000 tons of metal each year and would boost France’s metalwork industry.



Viewpoint



Loïc Tanguy

— ENGINEER
in charge of the “Very-low-level metal waste reuse” project for Andra’s industrial division.

“Sustainable waste management, whether we are talking radioactive or domestic waste, involves disposing only of what is strictly necessary, so that we can save precious disposal space. This really is an issue of social responsibility.”



Did you know?

TRACKING METALS

— Under French law, as a precautionary measure, any waste from areas that may have been contaminated by radioactivity are deemed to be radioactive. This radioactive (or potentially radioactive) waste must be managed using a process that is completely separate from conventional waste management systems. This means that Andra’s CSTFA very-low-level waste disposal facility takes in metals from nuclear dismantling projects, even though some of these materials are only slightly radioactive, if at all. The plan to recycle these metals within the nuclear industry would allow them to be reused while ensuring traceability, and would both save space at disposal facilities and reduce the use of new materials, which would in turn reduce the environmental footprint of its disposal facilities.





Designing a reversible deep geological disposal facility would enable future generations to choose to change or adjust the disposal process. This process moved forward in 2009.



ENSURING THAT HLW AND ILW-LL DISPOSAL IS REVERSIBLE

— In 2009, Andra reported to the French Government on progress since 2005 with regard to the technical, social and political issues of reversible waste disposal.

This work follows on from expectations expressed by society at large, in particular during the public debate in 2005 on the management of radioactive waste, as embodied in the Act dated 28 June 2006, requiring that deep geological disposal of the most highly radioactive waste should be reversible for a period of at least 100 years. By 2015-2016, scientists will be expected to make proposals concerning reversibility and a debate will be held in order to prepare for future legislation on the conditions for reversibility.

TECHNOLOGICAL AND SCIENTIFIC CHALLENGES

— Opening a reversible waste disposal facility in 2025 calls for research into technical systems for ensuring that reversibility is taken into consideration right from the facility's design stage. Andra's recent report presents industrial prototypes for inserting and withdrawing waste packages from their disposal cells. Scientific studies have also been carried out to describe the likely condition of the packages and the environmental conditions at the time of withdrawal operations.

Finally, a gradual construction process will need to be used for the disposal facilities, in order to take into account any technical and scientific progress that may affect the disposal concepts used.

BROAD DISCUSSIONS

— Andra's work on the reversible disposal concept involves discussions with many local and international stakeholders. In April 2009, the Forum on Stakeholder Confidence (FSC) meeting held by the Nuclear Energy Agency (NEA/OECD) in Bar-le-Duc featured significant discussion on reversibility issues. In October 2009, the French High Committee for Transparency and Information on Nuclear Safety discussed the issue (see p.27 of this report) at a meeting, during which representatives of Andra, the French National Assessment Board and the National Association of Local Information Committees provided their viewpoint.



Did you know?

ANDRA'S FOCUS ON HUMANITIES AND SOCIAL SCIENCES

— Andra's objective is to offer safe and reliable solutions that meet society's expectations for waste management. The Agency's work has for a number of years included humanities and social sciences research, as part of our scientific programme, drawing on the support of an Advisory Committee for the Implementation of the Information and Consultation Plan (COESDIC), which is overseen by Andra's Scientific Council.





Reversibility was one of the key issues debated at the **Forum on Stakeholder Confidence** in Bar-le-Duc.





— A multidisciplinary conference on reversibility in Nancy was attended by around 100 delegates.

— On an international level, work initiated in 2008 by the NEA Radioactive Waste Management Committee (RWMC) at Andra's suggestion, continued in 2009 with the aim of developing an international scale on retrievability.

The planned scale is a tool to give stakeholders from different countries a common basis for their discussions, clearly showing the gradual nature of waste disposal and its different stages, right up to closure of the repository and changes in waste retrieval capacity.

UNDERSTANDING WHAT SOCIETY WANTS

— In 2009, Andra worked in close collaboration with humanities and social science researchers to better identify the expectations of civil society and the various stakeholders with regard to reversibility.

In June, a multidisciplinary conference held in Nancy (see photo above) brought together engineers and researchers in earth and social sciences in order to explore new interactions between science, technology and society in the area of reversibility. This idea was also discussed from the perspective of preserving the memory of disposal facilities and public involvement in government decisions, etc. Andra also commissioned a sociologist, Francis Chateauraynaud, in 2009 to look at how reversibility is discussed in the public domain and to write up a history of the way the concept is used. The aim of this study was to highlight the different conceptions of reversibility and the way the term is used by institutional bodies, the media and society at large.

Viewpoint



Yannick Barthe

— RESEARCHER AT THE CNRS Innovation and Sociology Centre, École des Mines, Paris

"Is it not too expensive for future generations to require them to permanently monitor disposal facilities in the hope that innovative solutions will be developed [reversibility]? Probably, yes. However, the decision to use irreversible disposal would have the major disadvantage of robbing future generations of a precious commodity – the freedom to choose. Reversibility is thus a way of redefining our moral responsibility towards future generation."

From "La Recherche" magazine, Issue 439, March 2010.



ACTION!

REVERSIBILITY ON DISPLAY

— The Technological Exhibition Facility, which opened in 2009 in Saudron in north-eastern France, presents industrial processes and prototypes that are being studied for use in the emplacement and withdrawal of waste packages at the future deep geological repository. Andra's proposals with regard to reversibility are also presented in a travelling exhibition that tours towns and villages in the Meuse and Haute-Marne districts to provide local residents with information and a chance to discuss all the aspects of the planned deep geological repository.





Andra has developed **prototypes** for emplacing high-level waste packages in disposal cells and subsequently withdrawing them.



Research into long-term solutions for storing information about waste disposal, and new ways to pass on this information to future generations. A few issues relating to memory addressed by Andra in 2009.

PRESERVING THE MEMORY OF DISPOSAL FACILITIES



— Imagine if the CSM waste disposal facility in Normandy were to be rediscovered in the distant future, when the question of radioactive waste disposal had long been forgotten. This scenario was the inspiration for a short film shot in May 2009, *“Le secret oublié”* (The Forgotten Secret), which tackles the issue of preserving and passing on the memory of disposal facilities. The film was sponsored by Andra and produced by young film and media students from Châtenay-Malabry. The project gave them an opportunity to discover filming and editing techniques and take the first step towards achieving their professional goals.

FROM ARCHIVAL PAPER...

— A special archival paper called “permanent paper” is used to store the “detailed memory” of surface disposal facilities, which ensures that data relating to the construction, operation and monitoring of the facility benefits from long-term preservation. Between 2007 and 2009, Andra carried out new studies including accelerated ageing tests, with the aim of further improving storage conditions for this information. In 2009, the research demonstrated that laser printing was the best technique for ensuring the long-term preservation of these documents and that the permanent paper could be kept for six to eight centuries if handled with care.

... TO SAPPHIRE DISCS

— The Agency is also working on even longer-term storage media, that could be used to store information on the disposal of long-lived radioactive waste, some of which could still present a risk several hundred millennia from now. One solution may be to write the data to a sapphire disc with a design-life of at least one million years. In 2009, Andra defined the content of a prototype disc, with text and images that would be visible to the naked eye or using a magnifying glass, informing future generations of the existence, function and content of disposal facilities.

ENCOURAGING MEMORY TRANSMISSION AT THE LOCAL LEVEL

— In January 2009, Andra was invited by the association *“Jovilliers Échanges et Culture”* at a conference held at Prémontrés Abbey in Jovilliers (Meuse district) to present its views on the memory of disposal facilities and express its desire to institute an ongoing dialogue at the local level with all parties interested in the related social issues. Alongside the work to develop long-term storage methods, the memory of waste disposal activities will only be maintained if local residents in areas around Andra facilities take possession of their own history and help to transmit it to future generations.



Did you know?

MEMORY IS AN ESSENTIAL ISSUE

— Long-term waste management requires the most important data on radioactive waste disposal facilities to be stored and passed onto future generations, in particular information regarding their existence and content. Andra is therefore committed to compiling all data relating to its disposal facilities and ensuring it is stored on long-term media. The CSM waste disposal facility in Normandy has a detailed archive totalling more than 500,000 pages of records, which was filed with the French National Archives in 2004 and 2005, and which is updated every five years. The records are designed to enable any phenomena observed at the CSM facility to be understood in order for informed decisions to be taken. Illustrated records are also publicly available on Andra’s website. The CSFMA and CSTFA facilities in north-eastern France are currently compiling their archives.



ARCHIVES

DU



MEMORY

In 2009, Andra collaborated with artist **Cécile Massart**, who created a work inspired by the CSFMA low- and intermediate-level short-lived waste disposal facility in Soulaines, in north-eastern France.



PROTECTING

people and the environment

Andra's two priorities are to protect human health and the environment. The Agency is a public body that is entrusted by the Government to safely manage radioactive waste in the short and long term. It undertakes specific actions in order to meet these priorities, as described below.

- + Examining waste packages **p.19**
- + Protecting the environment **p.22**
- + Monitoring human health around disposal facilities **p.24**



Andra carries out numerous tests on packages delivered to its facilities by waste producers. Read on for details about this essential activity and the progress made in 2009.

EXAMINING WASTE PACKAGES

— Prior to their disposal at the CSFMA facility, radioactive waste packages are controlled – a fundamental process in ensuring safe disposal. Waste producers have to comply with specifications drawn up by Andra in producing their packages. Once delivered to the facility, the packages are systematically inspected, firstly to ensure that their surface is not contaminated. Spot checks are also used to select packages for more advanced examinations to ensure that they meet the Agency’s specifications. Radioactivity measurements, X-ray examinations and gamma spectrometry are among the methods used. Further “destructive” test methods involve opening some packages in order to take an inventory of the waste stored in them, to ensure that they do not contain prohibited waste, and to take samples for radiological and chemical analysis. “Core sampling” procedures may be used with other packages. Cylindrical samples are extracted from the package and subjected to testing to ensure that the radionuclides are properly contained in the package. Any waste subjected to destructive testing is then repackaged and disposed of.

INVESTING IN TESTING

— In 2009, Andra’s Board voted to invest in increasing the tests and examinations that can be carried out on-site at the CSFMA and CSTFA waste disposal facilities. Some of these examinations require complex measurement equipment and are currently performed by specialist service providers, including the French Atomic Energy Commission (CEA) at its Cadarache site in the south of France. Andra-owned inspection equipment will be built at the CSFMA and CSTFA waste disposal facilities, which should reduce the need for waste transportation between the Agency’s sites and service provider facilities.



— Destructive testing of a radioactive waste package.



Waste package testing: a few figures

100%

of packages delivered to the CSFMA facility undergo irradiation and surface contamination inspections.

205

waste packages were spot-checked for visual inspection and advanced radiological inspections in 2009. 16 packages were found to be non-compliant.

34

waste packages were sent for imaging (X-ray, tomography etc.) or alpha radioactivity measurement.

15

packages underwent “destructive” inspections in 2009 (waste inventory or core sampling).



Action!

DISCUSSING RADIATION PROTECTION

— Radiation protection for staff working at Andra’s sites, members of the public visiting its disposal facilities and the local population around the facilities is a key priority for the Agency. In December 2009, the CSFMA and CSTFA waste disposal facilities organised a second Information Day for the radiation protection officers working for CSFMA and CSTFA service providers. The aim of the meeting was to discuss radiation protection practices and present the protection systems used by Andra.



FURTHER STUDY ON WASTE PACKAGES ALREADY AT DISPOSAL FACILITIES

— The CSM waste disposal facility in Normandy has not accepted new waste deliveries since 1994, and the existing packages can be used for further study. In 2009, when carrying out the facility safety review, Andra looked at the delivery notes for some older packages that had been disposed of at the start of the facility's industrial operations, to learn more about the risks associated with these packages. Some delivery notes described the radiological characteristics in imprecise, and often very conservative terms. Historical research into the inventory and location of these packages and discussions with the waste producers about what they were producing at the time of delivery ruled out any risks. These examinations highlighted the fact that for some particularly old packages, unusually high data may be recorded as a result of significant overestimations of the radiological content, often for precautionary reasons.

RESEARCH INTO FUTURE HLW AND ILW-LL WASTE PACKAGES

— In 2009, Andra also continued its research and development work, in partnership with CEA, on testing and examination techniques to be used in the future reversible deep geological disposal facility for high-level waste and intermediate-level, long-lived waste (HLW and ILW-LL). The aim of this work is to design technologies that will be appropriate for the examination of these waste packages, in particular to reduce the need for destructive testing which requires large-scale facilities and major precautions.



Did you know?

SAFE DISPOSAL REQUIRES CONSTANT VIGILANCE

— Andra did not report any regulatory non-compliance to the French Nuclear Safety Authority (ASN) in 2009 for any of its disposal facilities with regard to safety, radiation protection or the radiological impact on the environment. Only four events were declared to the ASN, none of which were significant from a safety perspective. Events reported included the fact that small quantities of water had been found in the underground piping used to capture infiltrated rainwater in the disposal structures at the CSFMA facility in March 2009, or the detection of traces of radioactivity that were slightly higher than normal on a truck delivering low- and intermediate-level short-lived waste packages. These deviations were immediately corrected, and classified zero on the International Nuclear Event Scale (INES). At a press conference on 22 April, the ASN reported in very positive terms on its audits of Andra facilities in 2009.



All waste packages delivered to the CSFMA facility are examined before disposal.



The Agency carried out thousands of environmental sampling operations for monitoring purposes, to ensure that its activities have the lowest possible impact on the environment.

Viewpoint



André-Claude Lacoste

— CHAIRMAN of the French Nuclear Safety Authority (ASN)

“Thousands of measurements taken in and around the facilities have established that the maximum dose received in extreme conditions is minute. (...) There is no likelihood of any consequences for human health. Our assessment of the way in which Andra manages its facilities is positive.”

Interview with the newspaper *Est-Éclair*, published on 27 August 2009.

PROTECTING THE ENVIRONMENT



— Piezometer measurements are used to check that the groundwater is free of radiological contamination.

— Every year, Andra carries out thousands of sampling and analysis operations in and around each of its radioactive waste disposal facilities, to check that its industrial activities have no significant environmental impact. Biological, chemical and radiological measurements and observations are carried out on the air, groundwater and surface water, fish, fauna and flora and the surrounding area. Piezometers are installed in a wide radius around Andra’s facilities (sometimes up to several tens of kilometres downstream of the facilities) to check that the water is free of radiological contamination. The measurements carried out by Andra around its facilities are regularly monitored. In 2009, the French Nuclear Safety Authority (ASN) carried out two inspection visits at the CSFMA and CSM facilities in

order to take its own water, air and plant samples, analyse the results and compare them with Andra’s findings. The conclusions show that the waste disposal facilities of the Manche and Aube districts inspected only had a slight impact on the environment. At the request of the Local Information and Oversight Committee for the Underground Research Laboratory, radiological monitoring of the environment was also carried out around the site. In addition, as part of the application to extend operations at its Underground Research Laboratory, Andra produced a new environmental reference state in 2009, which included all the measurements performed in the natural environment since the previous reference state carried out in 1996.



Did you know?

INFORMATION IS AVAILABLE

— 2009 Results from the environmental monitoring operations and the radiation protection conditions at each of Andra’s facilities are publicly available in reports published under Article 21 of the Act dated 13 June 2006 on transparency and nuclear safety.

See www.andra.fr or www.mesure-radioactive.fr



27,600

Sampling analysis operations were carried out by Andra in and around its facilities in 2009.



Viewpoint



Elisabeth Leclerc
 — SPECIALIST ENVIRONMENTAL ENGINEER and Manager of the Perennial Observatory of the Environment within Andra’s scientific division.

“The purpose of the observatory that Andra has established is to accurately describe the environment around the future deep geological repository ten years before it is built, and then to monitor it and protect the environment for the next century. As the environmental data gathered is likely to interest the wider scientific community, Andra has joined forces with 15 different research laboratories in order to define a joint programme of scientific study focusing on three specific ecosystems – woodland, meadow land and arable farmland.”



LONG-TERM ENVIRONMENTAL OBSERVATIONS

— In 2007, Andra established a Perennial Observatory of the Environment in north-eastern France (Meuse/Haute-Marne), as part of its deep geological repository project. The purpose of this observatory is to accurately describe the environment before and after the repository is built and to monitor changes in the environment over a period of at least one century. Initial studies are being carried out over a 10-year period to understand the various environmental compartments (fauna, flora, air, water, soil but also human activities) over an area of 900 sq km around the zone in which Andra plans to site its repository.

Within this broad area, more detailed studies are being carried out in a reference zone of approximately 250 square kilometres, chiefly to draw up an initial reference state of the environment of the future repository. The work of the Perennial Observatory of the Environment continued in 2009, drawing up this inventory of local biodiversity, monitoring watercourses and installing environmental sensors for precise measurements of air and water quality etc. Progress was also made in analysing the regional climate, by modelling the main metrological variables in the area. Accurate knowledge of these factors will enable local climatic conditions to be monitored closely over the next few years.



— The objective of the Perennial Observatory of the Environment is to describe and understand the various environmental compartments.



Did you know?

“ÉCOTHÈQUE” ESTABLISHED BY 2012

— Since 2007, the work of the Perennial Observatory of the Environment has involved taking large numbers of environmental samples (soil, fungus, lichen, cereals, milk, cheese, etc.). These samples will soon be stored in a new building, the “écothèque”, which is to be built close to the Underground Research Laboratory. The “écothèque” will ensure that samples can be traced to their original sampling conditions and enable further environmental measurements to be carried out if necessary. In the meantime, the samples are being stored at the CNRS environmental quality research observatory in Pau.



In 2009, Andra and its stakeholders committed themselves to go beyond their statutory obligations in protecting the health of people living around its facilities.

MONITORING HUMAN HEALTH AROUND DISPOSAL FACILITIES



— Aerial view of the CSFMA low- and intermediate-level waste disposal facility in north-eastern France (Aube).

— The French health authorities monitor the health of people living close to radioactive waste disposal facilities. This monitoring programme draws on the expertise of the French Institute for Radiological Protection and Nuclear Safety (IRSN) and the French Institute for Public Health Surveillance (InVS). Human health is also carefully monitored by a number of independent bodies such as health research centres, doctors and associations (including the regional health observatories, overseen by the Regional Councils).

— In April 2009, the local information committees for the AREVA spent fuel reprocessing plant in La Hague, the EDF nuclear power plant at Flamanville and the Andra CSM waste disposal facility in Normandy organised a scientific conference on human health around nuclear facilities. This event, featuring presentations by epidemiologists, biologists and specialists in the study of radioactivity, provided feedback on various public health studies carried out in the Normandy region, as a follow-up to studies carried out by the *Groupe Radioécologie Nord-Cotentin* in the 1980s.

One of the main findings presented at the conference was the absence of any increase in childhood leukaemia around any of the nuclear facilities in the Nord-Cotentin area, including the CSM waste disposal facility.

— In the Aube district in north-eastern France, at the request of the association “*Les citoyens du coin*”, the InVS launched a study in 2009 to find out whether there has been an increase in the number of cancer cases around the CSFMA low- and intermediate-level waste disposal facility since 1992 and to establish whether the frequency of occurrence is higher than elsewhere in the Champagne-Ardenne region and the rest of France. The results of this survey of nearly 30,000 people will be published in 2010.

— The “Environment/Health” commission run by the Local Information and Oversight Committee for the Underground Research Laboratory (Meuse/Haute-Marne) also started its work in 2009.



A DEMANDING MONITORING REGIME

— Before any new disposal facility is built, Andra is required by law to carry out an impact assessment, which includes analysis of the facility’s effects on human health and the environment. However, the Agency is not required to carry out an initial survey of health in the area around planned disposal sites or monitor the health of the local population. This is the Government’s responsibility. Nevertheless, in view of its planned deep geological repository, Andra entered into a partnership agreement with the InVS in November 2009, agreeing to implement regional health monitoring across the area in which the future reversible geological disposal facility for high- and intermediate-level long-lived waste could be built.

The InVS and Andra will jointly determine the health indicators to be monitored (cancer, cardiovascular disease, respiratory disorders etc.), the statistical sampling methods and the most relevant area for study. This process will involve drawing up an initial public health reference state for the local area, prior to building the geological disposal facility. The next stage, particularly after the repository is built, will be to use this reference state to accurately monitor the health of the local population. The planned monitoring policy will provide the health authorities with the information they need to carry out and studies in response to concerns or information requests raised by the future local information committee, by local people or associations.



Did you know?

GROUPE RADIOÉCOLOGIE NORD-COTENTIN (GRNC)

— This working group was established in 1997 by the French Ministers for the Environment and for Health, in order to determine whether radioactive releases from the nuclear facilities at the La Hague site in Normandy may have caused leukaemia in the region. More than 50 experts were involved at one stage or another in this wide-ranging working group, drawing together monitoring bodies, local information committees, research bodies in France and abroad, and representatives of associations and nuclear operators, including Andra. By 1999, the GRNC’s initial studies had not found any link between the cases of leukaemia observed and the radioactive releases, which were much too low to have caused any risk to the local population.



Viewpoint



Yannick Arimone
— EPIDEMIOLOGIST,
Andra risk management
division

“The health monitoring policy initiated by Andra in the Meuse/Haute-Marne area draws together various parties, including the French Institute for Public Health Surveillance (InVS) and the “Health/environment” commission of the Local Information and Oversight Committee for the Underground Research Laboratory, with other research bodies, such as hospitals, regional health observatories etc., joining the study soon. The InVS will carry out the statistical and epidemiological studies, and Andra will under no circumstances have access to personal medical information for obvious confidentiality and privacy reasons. Only the final, anonymous statistical data will be available to the Agency.”





COOPERATING

on a day-to-day basis

The nature of Andra's activities means that its relationship with other stakeholders is vital. It interacts with many different partners on a local, national and international scale, listening to them, discussing radioactive waste management issues with a transparent and open attitude, and involving itself in local life.

This open, interactive approach is expressed through a range of different initiatives, which are presented in the next few pages.

- + Working together requires openness **p.27**
- + Deep geological repository project: constructive discussions **p.29**
- + Contributing to local economic development **p.32**
- + Participating in local voluntary-sector and cultural activities **p.35**



Concrete examples of Andra's openness to civil society could be seen in 2009. The Agency took part in the work of the French High Committee for Transparency and Information on Nuclear Safety (HCTISN), invited new stakeholders to join its decision-making bodies, and took the time to present its projects and activities to all key local players.



WORKING TOGETHER REQUIRES OPENNESS

WORKING WITH THE HIGH COMMITTEE FOR TRANSPARENCY AND INFORMATION ON NUCLEAR SAFETY

— Throughout 2009, Andra got involved with the work of the High Committee for Transparency and Information on Nuclear Safety (HCTISN). Bruno Cahen, Director of Andra's Risk Management Division, was appointed to this body in 2009 on the basis of his expert knowledge of radioactive waste management. He was involved in the committee's work on the SOCATRI incident in 2008 and also presented the national inventory of radioactive materials and waste, which was published by Andra in 2009. Marie-Claude Dupuis, Andra's Chief Executive Officer also presented the Agency's activity to the HCTISN, with particular emphasis on the search for a site for the disposal of low-level long-lived waste (the LLW-LL project). This presentation led to a decision by the committee in October 2009, to establish its own working group on consultation in the context of the search for a LLW-LL site.

INTERACTION WITH CIVIL SOCIETY

— The issue of radioactive waste management is relevant to society as a whole and Andra therefore sought as many opportunities as possible to interact with representatives of civil society in 2009 on the issues, industrial activities and projects that are relevant to the Agency.

From July 2009 onwards, the Agency's travelling exhibition presenting the deep geological repository project visited towns and villages in the Meuse and Haute-Marne districts in north-eastern France, discussing the project with local residents and seeking to understand their expectations and answer their questions. In June 2009, two information meetings were held in the Aube district, at locations that had been identified for further geological investigations with a view to disposal of low-level long-lived waste.

These initial meetings were intended as the first stage of an extensive discussion process involving the local population in these two locations, but the atmosphere was not one of constructive debate (see p.29 of the Activity Report). Andra endeavours to always be available to answer questions and also made presentations to the local information committees of the work and activities carried out at its disposal facilities. The Agency also continued its regular habit of welcoming the public at its facilities during annual Open Days. In 2009, more than 1,200 people visited Andra's facilities for the Open Day.



Action!

Listening to local people's concerns is a real priority for Andra. The new magazine "Journal de l'Andra" (100,000 copies circulated in the Manche, Aube, Meuse and Haute-Marne districts) features a comment page where local citizens can voice their opinions.



Did you know?

A HIGH COMMITTEE FOR TRANSPARENCY

— The French High Committee for Transparency and Information on Nuclear Safety (HCTISN) was established under the Act dated 13 June 2006. This body was created for the purposes of information, consultation and discussion, and has the power to issue an opinion on any question relating to the risks connected to nuclear activities in France and the relevant control and information processes. The High Committee has 60 members that represent all parties with an interest in activities in the nuclear industry – local councillors and members of parliament, representatives of the Government, the Nuclear Safety Authority (ASN) and the Institute for Radiological Protection and Nuclear Safety (IRSN), operators of nuclear facilities, representatives of local information committees, environment and health protection associations, scientific and medical experts etc. Minutes of all discussions held by the HCTISN and its recommendations and reports are freely available for viewing on its website.

<http://www.hctisn.fr>





+ Viewpoint



Christine Gilloire

— ÎLE DE FRANCE ENVIRONNEMENT

“Our country generates 80% of its electricity from nuclear energy. We cannot simply bury our heads in the sand and ignore the issues.

Nuclear waste is a reality and something needs to be done about it.

Despite my opposition to further development in this industry in our country, we need to find the least harmful option for managing the existing situation. I feel it is important to get involved in bodies from which I can gather reliable information, raise questions and get as clear an idea as possible of all the issues related to safety, waste management and production; these are forums where I can discuss with policymakers and, wherever possible, uphold the very critical requirement for honest and transparent information.

The Environment Round Table in France avoided discussing nuclear power, which was a great shame. I feel it is necessary to pass on information about nuclear energy to as wide an audience as possible to enable people to understand the reality of the situation. My presence on these bodies gives me the opportunity to pass on the questions and concerns of civil society.”



— Andra seeks to encourage debate on radioactive waste by maintaining close contacts with the local, national and international media. In June 2009, a press conference was organised to mark the publication of the latest edition of the National Inventory of Radioactive Materials and Waste. Journalists were also invited to the scientific conference on reversibility that was held in Nancy and to Andra’s Technological Exhibition Facility in north-eastern France (Meuse/Haute-Marne). The work on the cap of the CSM waste disposal facility in Normandy provided another opportunity for an open and honest dialogue between Andra and the media, highlighting the nature, aims and results of the work, for the information of the general public.

IMPROVING THE QUALITY OF DIALOGUE

— Throughout 2009, Andra drew on the opinions of the Advisory Committee for the Implementation of the Information and Consultation Policy (COESDIC) on its two planned radioactive waste disposal facilities. The members of COESDIC met four times, monitoring Andra’s work to inform and interact with local stakeholders with respect to the proposed zone of interest for detailed investigation in the Meuse/Haute-Marne area (see next page).

Committee members especially highlighted the educational and informative role played by mediation around this project.

INVOLVING ASSOCIATIONS IN OVERSEEING ANDRA’S ACTIVITIES

— In 2009, the Agency invited three environmental associations to become involved in its work. The associations, *France Nature Environnement*, *Île de France Environnement* and *Robin des Bois*, which are already represented on the French National Advisory Committee on Public Funding in the Field of Radioactivity (CNAR, see p. 16 of the Activity Report) were invited to join the steering committee involved in publishing the National Inventory of Radioactive Materials and Waste, alongside one member of the HCTISN.

The steering committee oversaw the drafting of the national inventory, ensuring that the data provided was comprehensive and that the document formed a consistent whole. The committee brings together representatives of the Ministry of the Environment and Energy, the French Nuclear Safety Authority (ASN), waste producers and members of parliament. The above associations will also be invited to take part in compiling the new national inventory, due for publication in 2012.



Did you know?

VERY CAREFUL CONSULTATION

— The Advisory Committee for the Implementation of the Information and Consultation Policy (COESDIC) is an independent advisory board set up by Andra in 2008 to supplement the discussion and dialogue policies implemented by the Agency with regard to its two planned radioactive waste disposal facilities. The committee features four members, chosen for their academic or professional expertise with regard to citizen involvement in industrial and technological decision-making. The members are Michel Callon, Professor of Sociology at the *École des Mines* in Paris and a member of Andra’s Scientific Council; Anne Bergmans, Sociologist and Professor at the University of Antwerp (Belgium); Pierre-Benoît Joly, Economist, Sociologist and Director of Research at the French Institute for Agronomy Research (Inra); Saida Laârouchi-Engström, manager of the “Environmental impact assessment and public information” department at SKB, Andra’s Swedish counterpart. The COESDIC annual reports are available on Andra’s website. www.andra.fr





Andra's actions in 2009 with regard to the planned construction of a deep geological repository in north-eastern France (Meuse/Haute Marne) focused on discussions, exchanges and explanations, with the aim of defining a zone that would be acceptable to all the stakeholders.











DEEP GEOLOGICAL REPOSITORY PROJECT: CONSTRUCTIVE DISCUSSIONS



Area map

— KEY

-  Hydraulic head gradient greater than 0.2 m/m
-  Thickness of the Callovo-Oxfordian layer less than 140 m
-  Ornain valley buffer zone (gradual changes in long-term hydraulic gradient)
-  Depth level studied in laboratory drifts of more than 600 m
-  Zone of interest for detailed investigation
-  Transposition zone
-  Underground Research Laboratory
-  Technological Exhibition Facility



— In 2009, elected representatives from the Meuse and Haute-Marne districts, along with representatives of civil and professional associations, were invited to voice their expectations with regard to Andra's proposals for defining a "zone of interest for detailed investigation" (ZIRA), in which the Agency will carry out geological surveys to define the location of the future deep geological repository. Discussions took the form of regular meetings with the elected representatives of the constituencies most directly affected by the 250 sq km zone defined by Andra in 2005 for the location of the new repository. In the first half of 2009, the Agency presented the scientific and technological requirements it has to meet, the provisional project timetable and gathered initial reactions. Councillors had the opportunity to give a written opinion on the initial proposals made by Andra and to request further explanations, for instance concerning waste

and material transportation during the construction phase, or the landscaping of muck piles issued from excavation operations.

At the same time, Andra presented its work to the local Chambers of Commerce, Chambers of Agriculture and two other voluntary-sector and professional stakeholders to ensure that they were properly informed, and had the opportunity to express their expectations and opinions with regard to their specific concerns.

TAKING INTO ACCOUNT THE REGIONAL DEVELOPMENT

— Andra then incorporated the information submitted by local stakeholders to develop its proposals further. For instance, the zone of interest proposed in October 2009 (ZIRA, see map above) allows access to the repository from the border area between the Meuse and Haute-Marne.





— Local stakeholders emphasised the importance of protecting the environment when the future deep geological repository is built.



Viewpoint



Pierre-Lionel Forbes

— DEPUTY MANAGER of the Meuse/Haute-Marne Centre

“In 2009, Andra constantly made itself available to answer the Local Information and Oversight Committee’s questions. This process enabled us to work together in partnership on the location of the future deep geological repository.”

— At the request of local elected representatives, Andra’s proposal makes safety the top priority, avoids locating the repository under residential areas of villages, and locates the main access shafts in a wooded area. The six proposed locations for surface facilities suggested by Andra after thorough analysis of the environmental and industrial constraints (residential areas, flood-risk areas, risks of aircraft crash etc.) are likewise compatible, both with Andra’s technical criteria and stakeholders’ expectations. These local organisations drew particular attention to importance of protecting the local environment by improving existing transport infrastructure and developing rail or river transport routes.

LOCAL COMMITTEE PLAYS A VITAL ROLE

— This process was carried out by Andra in partnership with the Local Information and Oversight Committee for the Underground Research Laboratory. The Committee set up its own body to work on issues relating to the location of industrial installations of the geological repository, and Andra presented its own proposals to this body on several occasions in 2009. In turn, the Local Information and Oversight Committee presented Andra’s proposed scenarios to the general public, by means of inserts in local newspapers, *Est Républicain* and *Journal de la Haute-Marne*, and its own publication, *Lettre du Clis*, which devoted the November issue to the location of the repository. Discussions between Andra and local stakeholders in the Meuse and Haute-Marne districts will continue over the next few years, particularly with regard to the location of surface facilities. The Agency now have to define more precise scenarios based on the 2009 proposals and initiate further discussions on the basis of the more specific suggestions.





Andra's new building, the Technological Exhibition Facility, opened in Saudron, north-eastern France, next to the Underground Research Laboratory, in 2009.



Jobs, purchasing, training and more... In 2009, Andra worked hard to promote projects run by local organisations and to develop the local economy.

CONTRIBUTING TO LOCAL ECONOMIC DEVELOPMENT

— Andra aims to contribute to economic life in the areas around its facilities by encouraging local companies to submit tenders in its procurement processes. In 2009, more than one-third of purchases (by value) for its waste disposal facilities were sourced from companies based in the local area.

This focus on local purchasing, in accordance with competition and equality rules, relates both to everyday purchasing and larger-scale procurements, such as for major construction work. Local contractors were hired to refit the fire protection system at the CSFMA facility and to carry out electrical installation work in the new drifts at the Underground Research Laboratory.

DEVELOPING A LOCAL INDUSTRIAL OFFERING

— In particular, in the Meuse/Haute-Marne districts, under the “Développement d’une offre d’ingénierie” charter signed the previous year with local stakeholders, the Agency initiated dialogue in 2009 with local contractors likely to tender for its procurement processes. The aim of these discussions were to explain Andra’s activities, requirements and procurement rules. This should enable contractors to identify any recruitment, training or investment needs to meet Andra’s own standards.

The Agency also organised meetings between its main subcontractors, which are often nationwide and international companies, and local contractors that these providers might want to work with.

A day of meetings was held at the Technological Exhibition Facility in December 2009, in partnership with Energic 52/55, an association of companies working in the metallurgy sector in the Meuse and Haute-Marne districts. The aim of this meeting was to foster exchanges between Andra’s buyers, the Agency’s major suppliers and local companies that may be interested in potential collaborations on the deep geological repository project.



The Technological Exhibition Facility: a few figures

06/09

Technological Exhibition Facility opened to the public

2,640

square metres of floor area in the main exhibition hall.

12

local contractors worked to build and fit out the facility in 2009

11

Andra employees work full-time at the Technological Exhibition Facility



Did you know?

KEEPING OUR WORD

— The four-year contract between the Government and Andra sets the Agency a target of 33% of purchasing (by value) for Andra’s sites that must be sourced from local providers by 2012, in compliance with applicable procedures. This target was exceeded in 2009 with a figure of 36.1%.





— The Technological Exhibition Facility also hosted the “*Matériaux du nucléaire et marchés d’ITER*” conference, which brought together researchers and industry representatives from the Lorraine and Champagne-Ardenne regions to discuss contracts relating to the ITER experimental fusion reactor project in the south of France.

— To ensure the rapid roll-out of this local development strategy, responsibility for Andra’s purchasing in the Meuse and Haute-Marne districts has been decentralised to the local sites, reflecting the Agency’s commitment to its host regions.

HELPING LOCAL EDUCATION, TRAINING AND STUDENT INFORMATION

— Andra’s centres also invest locally in technical and university-level education and training for young people, by providing information about local job opportunities related to Andra’s presence. In 2009, the CSFMA and CSTFA waste disposal facilities became partners in the “Maintenance in a Nuclear Environment” course offered jointly by the Blaise-Pascal Technical College and the Saint-Dizier Industrial Apprenticeship Training Centre in Haute-Marne. Three students from the first class to take the course have been accepted by Andra and two subcontractors on a work-linked training contract at the disposal facilities.



Action!

SUPPORTING THE ENVIRONMENTAL POLICIES OF LOCAL COMPANIES

— In Autumn 2009, Andra sponsored a competition organised by Aube Initiative, a body set up by the Troyes and Aube Chamber of Commerce to reward young business people for original activities and commitment to sustainable development. The €2,000 prize went to the company AGC, which installs heat pumps and water-heating solar panels, in recognition of the company’s work to raise customer awareness of renewable energy.



Viewpoint



David Raoul
— PROJECT MANAGER for the “Plateforme emploi” – Meuse Employment Centre



“Students currently at secondary and high schools in our local area will have job opportunities at the future Andra repository.”





Swallows

have a new home in the nesting tower built at La Chaise in north-eastern France, close to the CSFMA and CSTFA waste disposal facilities.





Playing a role in local life means taking part in local initiatives.
Here are some of the activities that Andra supported in 2009.

PARTICIPATING IN LOCAL VOLUNTARY SECTOR AND CULTURAL ACTIVITIES



PROMOTING AND PROTECTING BIODIVERSITY

— In the first-half of 2009, the CSFMA and CSTFA waste disposal facilities took part in the “*Le printemps des hirondelles*” campaign in partnership with the Pays de Soulaïnes environmental initiative centre. A nesting tower was installed in La Chaise, a village close to Andra’s site, allowing swallows to nest and scientists to study their population in the region. This initiative was followed up with activities for school children and a lecture on ornithology.

The nesting tower has already proved a success with the arrival of its first swallow colony. On February 2nd 2009, the CSFMA and CSTFA waste disposal facilities helped raise public awareness of the conservation of natural habitats for biodiversity, hosting a lecture by a scientist from the *Forêt d’Orient* Regional Nature Park on the topic of “Wetlands – teeming with life”. In the Meuse/Haute-Marne districts, bats were given special attention in 2009. With the help of a regional environmental protection commission, Andra carried out a survey of bat colonies in the southern Meuse and northern Haute-Marne areas, a particularly favourable habitat for this protected species.

In Normandy, Andra worked with the Faculty of Science at Caen University to conduct a botanical study into the grassed cap at the CSM waste disposal facility. Some of the areas have been left without any horticultural upkeep, to allow wildlife to develop in its own way. The purpose of this study is to observe how long it takes for typical local species to re-colonise the area.

PROMOTING SCIENTIFIC AND ENGINEERING CULTURE

— In 2009, Andra continued its efforts to introduce people of all ages and backgrounds to science and engineering. The CSM waste disposal facility continued its partnership with the Ludiver Planetarium for the 18th *Fête de la Science* event in November, with a travelling exhibition designed by the *Palais de la Découverte* to be both fun and educational, focusing on earthquakes and tsunamis. The CSFMA and CSTFA waste disposal facilities also organised a science event in partnership with the *Nature de Der* association and the local tourist office, featuring events to mark Darwin’s bicentenary, focusing on the evolution of species.



Action!

OPENING UP THE DOORS

— The Open Day organised by Andra’s facilities are an annual opportunity to interest people in science and engineering.

In June 2009, at the Meuse/Haute-Marne Centre, members of the public enjoyed a demonstration of tin-making by the association *Les Compagnons d’Osne-le-Val*, in commemoration of the region’s foundries and furnaces.

In September 2009, at the CSTFA facility, visitors were invited to take part in a scientific experiment looking at the permeability of sand, gravel and clay, on the stand run by the association *Les Petits Débrouillards*.





— A travelling exhibition on the History and future of clay.

— The CSFMA and CSTFA waste disposal facilities hosted a lecture for the *Fête de la Science* event. The talk, by a scientist from the Reims Planetarium, looked at the perception of the moon in literature, from Lucian of Samosata to Jules Verne, and the history of space exploration.

FOCUS ON CLAY

— The exhibition on the History and future of clay continued touring France throughout 2009. The presentation was first hosted by the new Technological Exhibition Facility, then at the CSFMA and CSTFA waste disposal facilities, followed by an eight-month residence at the *Palais de la Découverte* science museum in Paris, before heading off to Poitiers and then several French-speaking African countries. The exhibition was designed in 2008 by Andra, the University of Nancy and the association *Groupe français des argiles*, in partnership with the *Palais de la Découverte* and the *École nationale*

supérieure de géologie in Nancy. It presents the uses and functions of clay throughout history, from early buildings to the most advanced technologies. An illustrated book inspired by this exhibition has been published by Actes Sud.

SUPPORTING LOCAL CULTURAL HERITAGE

— In the areas where it works, Andra supports a number of initiatives to conserve and promote local cultural heritage. In the Meuse district, it supported improvement works to the visitor trails around *Fort de Liouville*, a 19th century military construction that was heavily damaged during the Great War, which is being restored by a local association.

In the Poissons county (Haute-Marne district), close to the Underground Research Laboratory, Andra has funded the installation of signposts to draw visitors' attention to places of interest.





In 2009, an adventure trail created by the Bar-le-Duc tourist office and sponsored by Andra took children and young people on a fun tour of the town's historical and cultural heritage.

In the Aube district, Napoleonic re-enactments take place at Brienne-le-Château in May every year, where history enthusiasts act out Napoleon's local battles that took place in 1814. As a young man, Bonaparte studied locally at the Brienne Military School. Andra was a financial partner in these events and invited local councillors to join them in its bivouac.

Leaving the sounds of the battlefield behind, the "Ombres et lumières" music festival in September at Clairvaux Abbey in September, with sponsorship from Andra, saw a number of excellent performances, including an appearance by pianist François-René Duchâble.

In the Manche district (Normandy), conservation and heritage took pride of place when Andra and the Cherbourg national society of natural science and mathematics entered into a partnership agreement to preserve the dried plant collection held by this society, which dates back to 1852.

Andra will provide funding for restoration of these pressed plant specimens, featured in a collection of more than 20,000 items compiled by Cherbourg botanists in the 19th century. Reproductions will then be available on the website of the Paris Natural History Museum, which is also a partner in the operation.



— Clairvaux Abbey hosts the "Ombres et Lumières" festival, sponsored by Andra.



Did you know?

PARTNERSHIP AGREEMENT WITH PARIS MUSEUM

— In 2009, Andra joined with the Palais de la Découverte science museum in Paris to help with the renovation of its permanent exhibitions. The museum aims to reach as wide an audience as possible and now wishes to update its displays. Andra will offer expertise for exhibits on "Matter and Energy", "Living Things" and "Earth and the Universe".





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