

# NOVA CHEMICALS

2002 Responsible Care® Annual Report



# PRESIDENT'S MESSAGE

Welcome to NOVA Chemicals' new Responsible Care Annual Report Web site. Here, you will find a summary of NOVA Chemicals' values, achievements and goals in the areas of safety, health and environmental protection.

To manage our activities in these crucial areas, NOVA Chemicals has participated in the chemical industry's Responsible Care® Program for the past 15 years. As we face the challenges of growing our businesses, our commitment to the principles of Responsible Care remains steadfast and continues to serve as the platform for our efforts. In keeping with our goal of being an industry leader in Responsible Care, we strive to operate with zero incidents and to ensure our products are safely manufactured, safe to use, and handled responsibly throughout their lifecycles.

We demonstrate our dedication through our own actions and through substantial investments in industry-wide initiatives. For instance, NOVA Chemicals supports efforts to study the health effects of chemicals by investing in the American Chemistry Council's Long-Range Research Initiative (LRI). This initiative sponsors independent research at the Chemical Industry Institute of Toxicology (CIIT), an organization NOVA Chemicals has supported for more than 20 years.

In response to global events of 2001-2002, the United States chemical industry placed an even stronger emphasis on emergency preparedness and security. As part of these efforts, NOVA Chemicals adopted the American Chemistry Council's (ACC) new Responsible Care Security Code and conducted a security screening and vulnerability assessment for all facilities. Particular attention was placed on reducing risks inherent to the specific products made at each site. This comprehensive re-evaluation and enhancement of security measures and practices at all of our facilities will continue in 2003 and beyond.

To better explain our security measures, as well as our safety, health and environmental initiatives and performance, we are pleased to introduce a new, user-friendly online format. Our research led to the conclusion that a web-based report would be the best way to effectively communicate our work and performance in Responsible Care to the public, stakeholders and community members. This 2002 Responsible Care Annual Report Web site will present our Responsible Care strategy, philosophy and performance at the corporate level.



Jeffrey M. Lipton  
*President and Chief Executive Officer*

Building on this foundation, we will be adding information about NOVA Chemicals' activities and performance in every community in which we operate. These site-based reports will be integrated into the Responsible Care Annual Report Web site in the near future.

We hope that this report conveys the seriousness and diligence with which we approach our work in the area of Responsible Care, and helps to challenge common misconceptions about our industry, products and operations. NOVA Chemicals continues to operate and manage our businesses on the principle that all incidents that could result in harm to people, property or the environment can be prevented. We take great pride in the chemical industry's reputation as the safest manufacturing industry and the largest industrial investor in research and development in America. We believe our products, and the chemical industry, help to make the world a better place.

A handwritten signature in black ink, which appears to read "Jeffrey M. Lipton". The signature is written in a cursive, flowing style.

# RESPONSIBLE CARE® AT NOVA CHEMICALS

Responsible Care is a voluntary initiative developed by the chemical industry to improve performance in environmental protection, health and safety.

It is based on a set of Guiding Principles and Codes of Management Practice that address issues such as community awareness and outreach; emergency preparedness and response; product stewardship; employee, contractor and process safety; transportation and distribution; pollution prevention and security. From its beginnings in Canada in 1985, the initiative has now extended to over 47 countries in North America, South America, Asia and Europe.

NOVA Chemicals believes Responsible Care makes good business sense. The company continuously strives to improve its Responsible Care management systems by listening to employees, the community and customers; by conducting research to understand the potential impacts of products on the health and well-being of the public; and by implementing inherently safe technologies and processes. NOVA Chemicals is proud to be a founding member and an industry leader in Responsible Care.



The Montreal, Quebec staff with members of NOVA Chemicals' Executive Leadership Team and Responsible Care Council at the President's Award for Responsible Care Banquet in Montreal on May 28, 2002.

## RESPONSIBLE CARE® MANAGEMENT SYSTEMS

NOVA Chemicals' Responsible Care organizational structure reflects the conviction that health, safety and environmental performance is the responsibility of all employees and contractors. Responsible Care leadership requirements have been built into all businesses, and senior management shares accountability for the success of the company's Responsible Care program. Accordingly, the Board of Directors and Chief

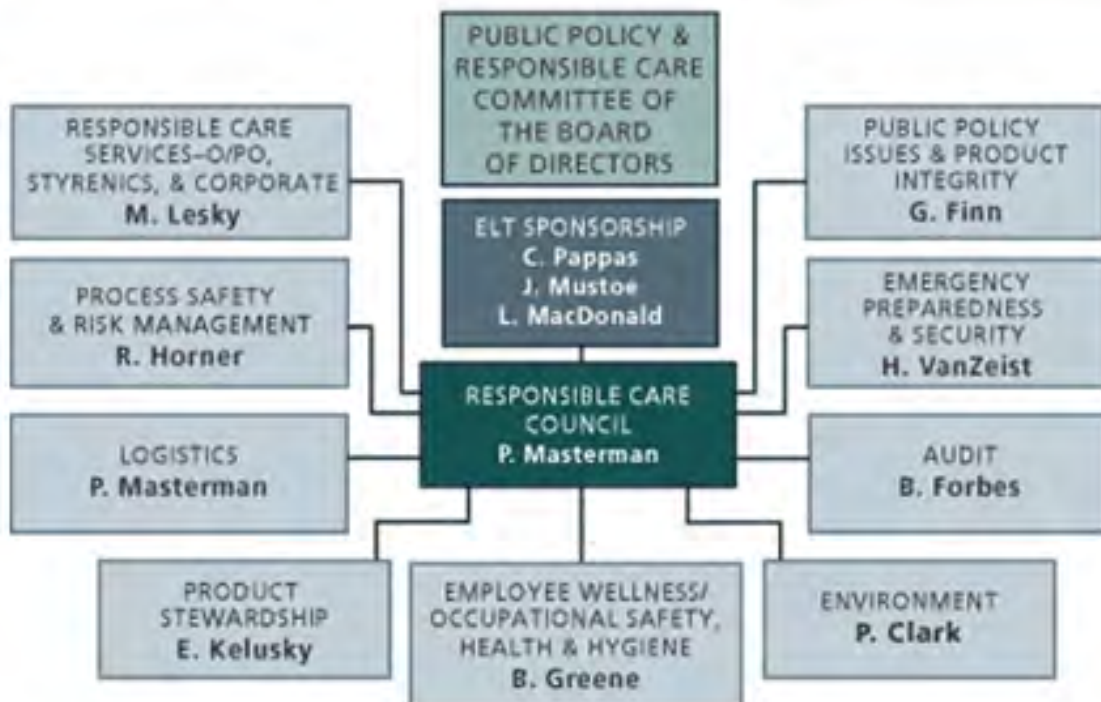
Executive Officer of NOVA Chemicals are actively involved in establishing and evaluating the company's Responsible Care strategy, performance targets and objectives. These senior leaders meet each Monday morning, and the first item on the agenda is a review of the company's global Responsible Care performance. If there are any issues or situations that require attention, they develop an action plan and proceed with implementation.

# RESPONSIBLE CARE® AT NOVA CHEMICALS [CONTINUED]

The Responsible Care Council (RCC), composed of senior leaders from across the company, oversees and guides NOVA Chemicals' Responsible Care program. The RCC reports directly to NOVA Chemicals' Executive Leadership Team and is responsible for ensuring that a strategy for continuous improvement in safety, health and environmental performance is pursued in all areas. The RCC ensures implementation of

the Responsible Care policy and strategy by establishing plans, performance goals and objectives, and management systems. In addition to these duties, each RCC member champions a specific health, safety or environmental functional area and the functional experts engaged in support of that area. At NOVA Chemicals, responsibility for Responsible Care excellence is shared by employees and contractors.

## RESPONSIBLE CARE COUNCIL



NOVA Chemicals seeks ongoing efficiency improvement in all of the company's operations, and contributes to social development through policies and practices that emphasize health and safety, workplace diversity, leadership, life-long learning and active community outreach and involvement



# NOVA CHEMICALS' RESPONSIBLE CARE® VISION

We will be a leader in the chemical industry world-wide, in terms of our performance and commitment to Responsible Care. Our ultimate goal is to operate our businesses without harm to people, property and the environment.

---

---

# NOVA CHEMICALS' RESPONSIBLE CARE® POLICY

NOVA Chemicals is committed to being a leader in achieving and maintaining superior Responsible Care performance. The following principles reflect the ethic of Responsible Care and guide our conduct worldwide. We will:

- Manage our business on the premise that all incidents that could result in harm to people, property or the environment can be prevented.
- Operate in accordance with applicable laws and regulations and to the higher of NOVA Chemicals' or local health, safety and environmental standards.
- Ensure that employees and contractors understand their responsibilities and are provided with the training and support necessary to integrate Responsible Care principles into their work.
- Provide the human, material and financial resources required to integrate Responsible Care principles into all of our business operations.
- Understand the health, safety, environmental and resource impacts of all of our products at all stages of their lifecycle and take steps necessary to protect our stakeholders and the environment, and conserve resources.
- Seek and incorporate public input regarding our products and operations, and review our Responsible Care performance with our stakeholders to facilitate continuous improvement.
- Support health, safety and environmental education and research, and use best available science, technology and industry practices where economically and technically feasible.
- Participate proactively in Responsible Care-related public policy development processes, and the development of industry standards.
- Foster business relationships with companies that demonstrate a commitment to responsible health, safety and environmental management practices.

# MANAGING PRODUCTS THROUGH THEIR LIFECYCLES

At NOVA Chemicals, we are committed to managing the impact of our products across the full commercial product lifecycle.

Our product stewardship program addresses product regulations and risk management issues in new product design, market development, raw material selection, product manufacturing, distribution and sales, product use, recovery and reuse, and end use or disposal.

Our commitment to product stewardship involves our employees, customers and distributors, their customers, regulatory authorities and other interested parties. Our work includes product research, maintaining accurate product information, ensuring compliance with regulations, advising customers on product selection and performance, and working with selected trade associations to manage major issues confronting the chemical and plastics industry.

## TAKING THE LEAD ON RESEARCH

NOVA Chemicals conducts long term strategic testing and science-based risk reviews of our products through industry association work groups.

In 2001, NOVA Chemicals volunteered with other producers to review six of its olefin products as part of the U.S. Environmental Protection Agency's (EPA) High Production Volume (HPV) Challenge program. This multi-tiered, long-term project will further characterize the human health and environmental effects of these chemicals. The industry consortium submitted the testing plans and summaries of existing information for each sponsored chemical to the EPA in 2002, and the actual testing of these products is now underway. All reports will be publicly available on the EPA's HPV website starting in 2004-2005.

NOVA Chemicals also sponsors research on ethylbenzene as part of the EPA's Voluntary Children's Chemical Evaluation Program (VCCEP) pilot. This commitment requires the company to conduct toxicological reviews and other assessments to more fully understand the hazards associated with ethylbenzene, a key feedstock in the production of styrene. The research will provide



# MANAGING PRODUCTS THROUGH THEIR LIFECYCLES [CONTINUED]

exposure and hazard data in efforts to protect children's health. The testing is underway and the results will be presented to an independent panel of scientists at the end of 2004 when completed.

The ACC's Long Range Research Initiative (LRI) sponsors independent, third-party research at the CIIT (Chemical Industry Institute of Toxicology) Centers for Health Research and at other prominent research centers and universities. NOVA Chemicals has been a strong supporter of the LRI, beginning as a Board member when the program was launched in 1999 and serving as Chair of the Board Research Committee in 2001/2002. In 2002, the board approved the LRI and its accompanying Communication Plan. Long-term communication messages have been created by the CIIT Executive Committee and Board to convey the priorities of the chemical industry for future research in health risk assessment and to explain the value and relevance of the LRI to ACC members and other audiences. The driving forces for the LRI include increased public demand for chemical exposure information and for testing and identification of chronic health hazards. NOVA Chemicals was one of the first companies to actively support CIIT, and has consistently provided financial backing for over 20 years. We have provided funds in excess of \$1 million to assist CIIT in its work regarding the effects of chemicals on human health, and we regularly collaborate with CIIT researchers.

## PROMOTING GOOD STEWARDSHIP

Through its "Partnerships in Commitment" (PIC) program, the company engages support from customers, suppliers, carriers and distributors to work cooperatively to safely handle and use our products. For the second consecutive year, in 2002 over 90% of NOVA Chemicals' selected business partners agreed to support Responsible Care principles as part of doing business. To date, NOVA Chemicals has provided Responsible Care information to over 1,000 commercial parties through this education and outreach program.

NOVA Chemicals plays an active role in the chemical industry's product stewardship efforts and encourages long-term environmentally and economically sustainable plastics resource recovery and recycling programs. The company is a member of the American Plastics Council (APC), the Canadian Chemical Producers' Association



(CCPA), the Canadian Plastics Industry Association (CPIA), the Canadian Environment and Plastics Industry Council (EPIC), and the Association of Plastics Manufacturers in Europe (APME).

As examples of the work being done by NOVA Chemicals in partnership with these and other industry groups, consider the following items from 2002:

- NOVA Chemicals is a primary funding member of EPIC, which sponsors Canadian plastics recycling programs, projects and communications. This year, EPIC published a new technical report, entitled "Recycled Plastic Lumber & Woodfibre Composites," which highlights leading companies and emerging technologies for reprocessing polyethylene into high quality structural decking, posts and other composite wood products. This is part of EPIC's continued focus on supporting the development of new commercial products using recovered plastic materials.
- The Polystyrene Packaging Council (PSPC) authorized Franklin Associates, Ltd. to conduct a life cycle inventory (LCI) of foodservice products. The LCI will be an update of a 1990 study comparing foam polystyrene foodservice items to bleached paperboard products, and the new LCI will include bio-based materials. NOVA Chemicals provided Franklin Associates with comprehensive data regarding the production of expandable polystyrene (EPS) and polystyrene resins for use in the study. The PSPC anticipates the publication of the LCI study in 2003.

# MANAGING PRODUCTS THROUGH THEIR LIFECYCLES [CONTINUED]

## COMMUNICATING PRODUCT INFORMATION

Providing current safe handling information is one of our most important goals. Throughout 2002, NOVA Chemicals continued to revise and translate its Material Safety Data Sheets (MSDS), Emergency Medical Response Protocols, Transportation Safety Data Sheets, Product Backgrounders, safety guides, product shipping cartons and labels and other product information and literature.

In addition, we created information briefs to update customers on select regulatory and legislative developments. We reviewed and distributed key publications on product unloading, storage and handling. A new information guide for polyethylene customers, entitled "Ventilation Guidelines for Heat Processing Polyethylene," was created. This document summarizes basic ventilation system considerations including air exhaust/supply balance, control of air contaminants, heat control and air conservation.

## PRODUCT DATA ON THE WEB

Our EPS customers identified factual, accessible data on EPS cups and containers as a priority for achieving growth. In response to this market need, NOVA Chemicals recently launched [www.DYLITE.com](http://www.DYLITE.com). This first generation of the website features simple navigation to information about our DYLITE® cup resin, including technical data, product application and care information and extensive environmental facts. We plan to continue growing and developing the site by posting additional technical, Responsible Care and application bulletins, brochures and presentations.

## INDUSTRY RECOGNITION

The CCPA's re-verification report on NOVA Chemicals identified our Product Stewardship Program as a "Best Practice." A quote from the report states:

**"NOVA's Product Stewardship program is well defined, aggressively implemented and an industry best practice worthy of being a model for others to follow."**

In addition, a detailed review of our efforts to communicate information to external parties regarding the health effects of our products was identified as a Best Practice.

As part of our program for managing Alberta's hydrocarbon supply relationships, NOVA Chemicals is an associate member of the Canadian Association of Petroleum Producers (CAPP). In 2002 we submitted information on our 2001-02 Canadian Responsible Care programs and performance under their benchmarking program. Following a review of this submission, the CAPP awarded NOVA Chemicals the highest (platinum) level of recognition for EH&S Management Systems.





# KEEPING WORKERS SAFE

NOVA Chemicals operates on the premise that all work-related illnesses and injuries can be prevented.

Our occupational safety and health programs are designed to protect employees and contractors from both immediate on-the-job and long-term health risks. As the foundation for these efforts, NOVA Chemicals fosters an environment in which all workers are responsible for maintaining the health and safety of their fellow employees.

## INCIDENT RESPONSE, REPORTING AND LEARNING

A key tool in reaching NOVA Chemicals' occupational safety objectives is the Incident Learning Process (ILP). The ILP is used company-wide to rigorously review all injuries, environmental releases, transportation incidents, production losses, and "near hit" events. The ILP system is structured to enable all plants to share information to prevent recurring incidents.

## BEHAVIORAL-BASED SAFETY (BBS) PROGRAMS

All employees and contractors are encouraged to maintain a high level of awareness for their personal safety and that of their co-workers. However, since each facility and work situation poses its own set of challenges to safety, NOVA Chemicals' plants use site-specific initiatives in conjunction with company-wide programs to manage their safety performance.

Behavior-Based Safety (BBS) programs contribute to continuous safety improvement in production and maintenance tasks through observation, employee feedback and behavior modification. Employees monitor on-the-job behavior and then develop solutions to positively reinforce safe behaviors and modify "at-risk" behaviors to reduce the chance of injury. These systems enable the sites' employees to conduct "observations" to assess whether co-workers' work practices are safe or at-risk. These observations are based on an inventory of critical behaviors, including the use of personal protective equipment, job inspections, tools and equipment, body positioning, environmental awareness, housekeeping and office ergonomics.

NOVA Chemicals has four sites in the Canadian province of Ontario, and they all actively participate in an innovative contractor safety-training program administered by the Sarnia-Lambton Industrial



Education Co-operative. The program provides courses in BBS programs and other relevant topics geared towards contract workers in a manufacturing environment.

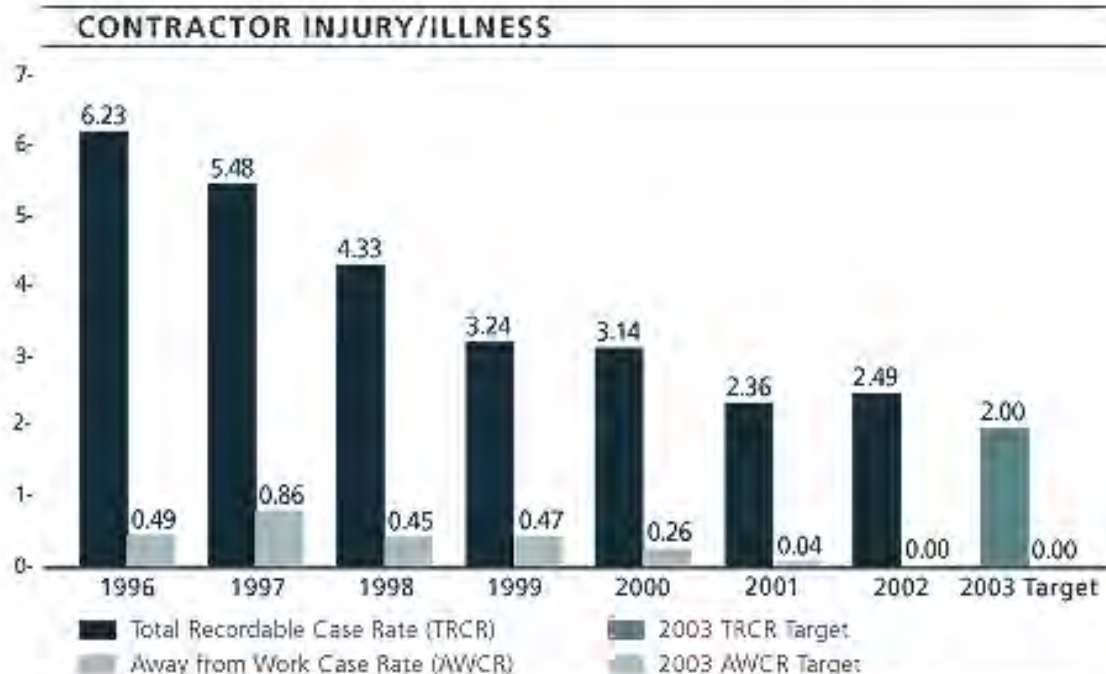
## OCCUPATIONAL SAFETY PERFORMANCE COMPANY-WIDE

In 2002, NOVA Chemicals' employee away-from-work injury/illness case rate (AWCR) was 0.13. The employee total recordable case rate (TRCR) increased from 1.12 in 2001 to 1.30 in 2002. Due to the emphasis we place on employee safety, we find this increase unacceptable. We are working diligently to determine the causes of this increase so we may ensure that our performance improves.

## KEEPING WORKERS SAFE [CONTINUED]

For 2003, the company has set an AWCR target of 0 for both employees and contractors, and TRCR objectives of 1.0 or less for employees and 2.0 or less for contractors.

**RECOGNITION FOR WORKING SAFELY**  
NOVA Chemicals was presented with the ACC's Performance Achievement Award in 2002 for 25% improvement over a five-year period in the areas of safety and health. Only 25 companies per year can earn this distinction out of approximately 150 member companies.



**Total Recordable Case Rate (TRCR):** The number of away from work cases, medical treatment cases or restricted work cases (where the work routine is restricted due to the work-related injury or illness) as a rate per 200,000 hours worked.

**Away-from-Work Case Rate (AWCR):** The number of illnesses or injuries resulting in absences from work, as a rate per 200,000 hours worked.

## KEEPING WORKERS SAFE [CONTINUED]

### **IN MEMORIAL**

It is with sadness that we report the loss of one of our valued employees. In April 2002, Mr. Harold Galupi suffered a fatal fall at our Monaca, PA facility. Mr. Galupi was a Chemical Technician and was employed at the manufacturing site for over 25 years. He is sorely missed by his family, friends and co-workers.

Although the Occupational Safety and Health Administration (OSHA) did not find the company in violation of applicable standards, this tragedy has prompted many improvements in safety at the Monaca, PA site and other NOVA Chemicals locations to ensure that such an incident cannot occur again.

# OPERATING PLANTS SAFELY AND EFFICIENTLY

Through effective process safety management, we reduce the risk of uncontrolled process events such as fires, explosions, and accidental chemical releases.



The company employs a comprehensive set of Responsible Care Process Safety Standards and Guidelines to help minimize these events. Our Standards outline specific requirements for managing process risk, managing organizational and manufacturing changes, ensuring equipment integrity, and controlling plant purchases of equipment and materials. All of NOVA Chemicals' facilities strive to operate beyond the minimum process safety requirements of the U.S. Occupational Safety and Health Administration's (OSHA) Process Safety Management Regulation and the European Union's SEVESO II directive.

## LOPC AND PROCESS FIRES

In our industry, prevention of process fires or environmental incidents is an extremely important consideration. NOVA Chemicals has developed monitoring and reporting processes that ensure high levels of protection against serious incidents at our sites.

A Loss of Process Containment (LOPC) incident is defined as an event involving an unanticipated leak, spill or release of process material in sufficient quantity or concentration to the air, water, land, or work environment that resulted or could reasonably have resulted in a process, safety, or environmental incident. This definition helps us to share details about the types of LOPCs that occur within the company and to identify and effectively address them.

Process fires are an area of particular concern at NOVA Chemicals, because any uncontrolled fire that occurs at a chemical plant – no matter how small – could potentially cause harm to our employees and contractors, as well as serious damage to equipment, facilities, and the environment. We place such an emphasis on process fires that whenever an uncontrolled fire of any size takes place, business leadership must be notified immediately, and a thorough incident investigation is initiated.

# OPERATING PLANTS SAFELY AND EFFICIENTLY [CONTINUED]

NOVA Chemicals' approach to eliminating process fires is leading edge, and requires that conditions that could potentially lead to a fire are strictly reported and investigated, with actions taken to prevent recurrence. One very important step towards this goal is to identify all LOPC incidents that could potentially develop into uncontrolled process fires. A company-wide team works to identify and review all process fires and LOPC incidents to share learnings and develop company-wide recommendations to reduce the occurrence of electrical system faults, hydrocarbon leaks from flanges and pump seals, and polymer leaks at any stage in the manufacturing process.

## MANAGEMENT OF CHANGE

A major component of an effective process safety program is the management of change. At NOVA Chemicals, all changes in organization, personnel, process chemicals or materials, products, technology, or facilities must be recognized, reviewed, and approved prior to implementation to ensure these changes do not result in an unacceptable risk.

In 2002, the NOVA Chemicals Process Safety and Risk Management Council reviewed and updated NOVA Chemicals' internal Responsible Care Standard for Management of Change to better identify and manage the critical elements necessary to effectively implement organizational and process changes throughout our facilities and operations.

## ELECTRONIC EQUIPMENT MONITORING

Implementation of The VISIONS™ software system, first tested at NOVA Chemicals sites in 1999, continued in 2002. VISIONS allows maintenance and reliability groups at manufacturing facilities to store and access automated records of inspections, tests, and recommendations on fixed equipment such as piping, vessels, pressure relief devices, tanks, and reactors. It also enables our sites to utilize risk-based inspection tools to ensure the mechanical integrity of our process equipment.



# PROMOTING WORKER HEALTH & INDUSTRIAL HYGIENE

NOVA Chemicals is committed to providing an environment that is conducive to the health and wellness of all employees and contractors.

Staffed by full and part-time health professionals and industrial hygienists, NOVA Chemicals implements a variety of health and industrial hygiene programs. These programs focus on assessing hazards, limiting exposures to potentially hazardous materials, developing safe work practices, educating the workforce about personal protection and improving and maintaining general health.

## FOCUS ON PREVENTION

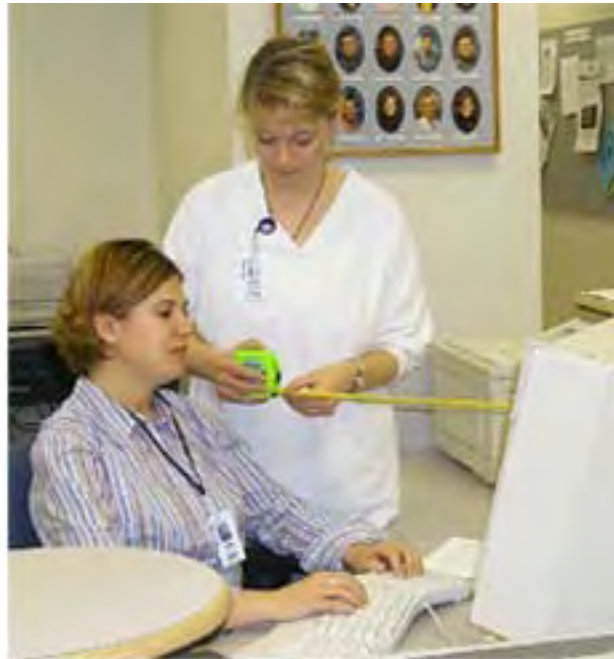
If a worker is exposed to a biological, chemical, physical or ergonomic hazard, he or she could potentially develop an adverse health reaction. NOVA Chemicals seeks to prevent exposures with chemical hazard reviews and a hazard-monitoring strategy. The company uses a centralized Material Safety Data Sheet database to help inform employees and customers about the hazards to which they may be exposed.

The company's health program also features medical surveillance programs, testing, physical exams, personal counseling and education for our employees. These specialized programs include industrial testing for potential exposure to contaminants or hazardous materials that could occur through either routine or non-routine work activities. Our health program also includes NOVA Chemicals' web-based "Wellness Checkpoint" health-risk assessment and resource tool. This website provides employees with up-to-date health data and information on a range of lifestyle-related topics and can be accessed both on the job and at home.

## TRACKING EMPLOYEE HEALTH

NOVA Chemicals' health & hygiene professionals chose Medgate™ occupational health and safety software as the best overall solution for tracking employee health records in 1997. Medgate is a comprehensive set of relational databases that integrate occupational health, hygiene and safety information. The program facilitates detailed analyses of injuries and illnesses across the organization.

In 2002, the company made a significant investment to update our Medgate software and



servers. The resulting increased tracking and record-keeping capabilities allow health professionals to perform more detailed trend analysis and identify areas or activities of greatest risk within the company. The benefit is that these high-risk areas and activities can then be better managed, and promotional programs can be put into place to help mitigate them.

## DRUG AND ALCOHOL POLICY

Our Drug & Alcohol Policy was revised in 2002 and reinforces our strict stance on the use of illegal drugs. We also updated our guidelines regarding the use of alcohol and prescription medications, as well as provisions for mandatory drug testing when necessary.

An important aspect of our drug and alcohol abuse program is that it is proactive as well as reactive. Employees have the option to self-refer into a treatment program with full support from NOVA Chemicals' health professionals and human resources. Similarly, if an employee is identified non-voluntarily through testing as having a drug or alcohol problem, depending on the circumstances, the same resources and support may be provided.

# PROMOTING WORKER HEALTH & INDUSTRIAL HYGIENE [CONTINUED]

In preparation for implementation in January of 2003, Leadership and Facilitator Training programs were completed and the Employee Training program was updated. Drug and Alcohol Programs in Europe are currently being benchmarked.

## INTERNATIONAL READINESS

Due to the global nature of NOVA Chemicals' business, it is crucial that our employees have the information they need to maintain their health and safety while traveling on company business. Our "International Readiness" intranet site's purpose is to help ensure business travel and international assignments are as safe and worry-free as possible. The site provides the information employees need to be fully prepared for an international trip. It informs employees about health and medical concerns, travel advisories, security conditions in airports, travel risk, overcoming jet lag, and expatriate/ repatriate status.

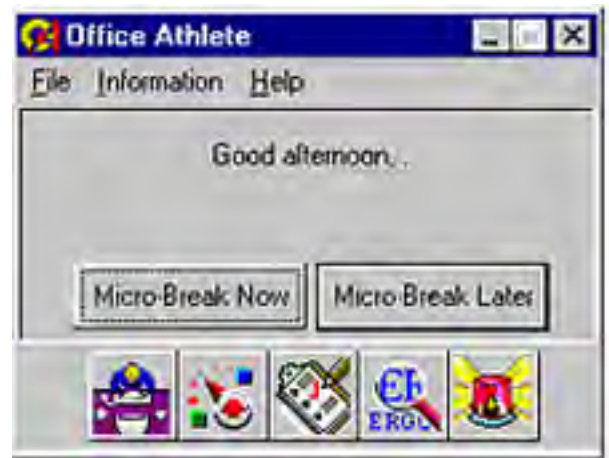
## OFFICE ERGONOMICS

The increased use of computers in the everyday work environment has led to a higher risk and incidence of repetitive strain injuries. Through leadership support, training, use of ergonomically-designed furniture, employee participation and encouragement of stretching and rest breaks, the company has been able to significantly reduce the total recordable case rate of office musculoskeletal disorders (MSDs) and repetitive strain injuries over the past three years (see chart). Other initiatives designed and rolled out in 2002 to address office worker injuries include:

- Ergonomic Resource Package for high-risk departments that includes an early identification and intervention process;
- Alternate Mousing Program (keyboard shortcuts, graphics tablet pilot, etc.);
- Home Office Ergonomic Strategy.

## OFFICE ATHLETE

As part of ongoing efforts to proactively reduce MSD injuries, a software program called "Office Athlete™" has been installed on each employee's computer. This automatic system provides guidance on ergonomic risks and reminds workers to take breaks at regular intervals to minimize the risk of repetitive strain injuries. In 2002, Office Athlete was made mandatory for identified high-risk groups and a process was developed for implementing its use through group leaders.

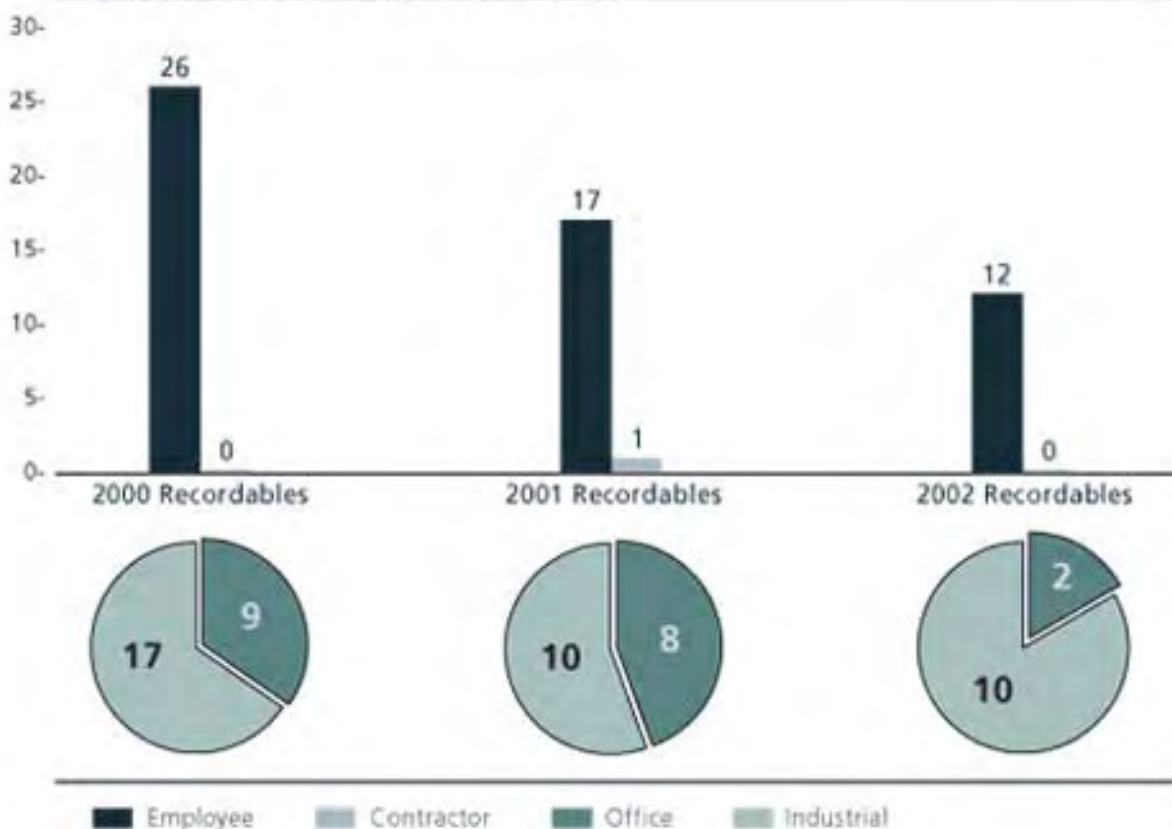


# PROMOTING WORKER HEALTH & INDUSTRIAL HYGIENE [CONTINUED]

NOVA Chemicals' employee at an ergonomic workstation adjusted to fit his specific needs.



## MUSCULOSKELETAL DISORDERS



*We recorded 12 cases of Musculoskeletal Disorders (MSDs) in 2002. MSD's remain the greatest cause of non-occupational short-term disability and occupational recordables at NOVA Chemicals. Preventative measures and intervention remain a high priority.*



# PROTECTING THE ENVIRONMENT

NOVA Chemicals strives to preserve the environment and eliminate waste by reducing emissions and environmental discharges and by continuously improving manufacturing processes.



Chesapeake, VA Styrenics Facility

NOVA Chemicals' strategy to limit its environmental impact focuses on five objectives:

1. Minimize the potential environmental risks associated with products during their lifecycle.
2. Conserve resources.
3. Minimize emissions and waste.
4. Proactively manage emerging environmental issues.
5. Achieve a sustainable competitive advantage through the effective use of technology to address environmental issues.

## TOWARDS THE FUTURE: REVIEWING OUR ENVIRONMENTAL VISION

In 2002, our Environmental Council sponsored a review of the NOVA Chemicals Environmental Vision. The purpose of the session was to identify a set of five-year environmental objectives to direct and challenge the organization. The revised Vision focuses on three areas: pollution prevention, natural resource management and climate change.

Upon final approval, the new Vision will be aligned with our business and industry objectives, supporting an environmental strategy that calls for proactive compliance and continuous improvement to achieve a superior level of environmental performance.

## GREENHOUSE GASES

NOVA Chemicals supports voluntary initiatives to improve energy efficiency and to reduce or avoid greenhouse gas emissions. As a company, we are taking voluntary, reasonable and cost-effective actions to reduce emissions of greenhouse gases. Furthermore, we encourage governments to pursue policies that promote healthy economies and international competitiveness while developing a greater understanding of the science of climate change.

The potential implications of climate change are of strategic importance for NOVA Chemicals. The company has set targets, implemented energy efficiency programs, and actively utilizes and researches new technologies to manufacture each kilogram of product with less energy and lower greenhouse gas (GHG) emissions. NOVA Chemicals' commitment to the reduction of GHG

# PROTECTING THE ENVIRONMENT

[CONTINUED]

emissions is supported by the recent construction of one of Canada's largest cogeneration facilities, which provides steam and power to the company's world-scale petrochemical complex located in Joffre, Alberta. When the cogeneration facility is operating at full capacity, it will offset annual GHG emissions in Alberta by approximately 1,600 kilotonnes. As a result of these offsets, NOVA Chemicals' net GHG emissions from our Canadian operations have risen only 3% compared to 1990 levels despite significantly increased petrochemical production. All of NOVA Chemicals' Canadian manufacturing sites use cogeneration or hydroelectricity as the primary sources of power to produce electricity. These are less greenhouse-gas-intensive sources of energy than the fossil fuel-based alternatives commonly available from regional power generators.



In addition to the emissions reduction strategy, NOVA Chemicals participates in several voluntary, cooperative efforts with government and industry to develop fair, workable policies to protect the environment and help reduce emissions. We are active members in both the Canadian Chemical Producers' Association and the American Chemistry Council, and we are charter participants in Canada's Voluntary Challenge and Registry (VCR) program. Our VCR Report is submitted annually to the VCR Inc. in Ottawa, the Natural Resources Canada Office of Energy Efficiency and other relevant government and industry stakeholders. NOVA Chemicals has participated in this voluntary reporting program for eight years, attaining Gold Level Status—VCR's highest rating—in October of 2002 for the 2001 reporting year. We also received the Chemical Sector Leadership Award in 2001 for the thoroughness of our greenhouse gas emissions reporting for our Canadian facilities and our company-wide emissions reduction activities. To view a copy of our latest VCR report, please [click here](#).



Indian Orchard, MA Styrenics Facility

NOVA Chemicals remains fully engaged in collaborative dialogue and consultation with industry and government to ensure that clearly outlined, sensible frameworks and regulations are in place for the implementation of the Kyoto Protocol in Canada. We will continue to promote policies that engender sustainable economic competition, particularly for export-dependent industries such as commodity chemicals. We also encourage government and industry to continue to work proactively and cooperatively to contribute to a greater understanding of the science surrounding climate change and to understand how we can target greenhouse gas emissions in the most strategic and effective manner. NOVA Chemicals believes that all governments should continue to develop and promote incentives and common-sense measures that encourage voluntary emissions controls and reductions.

## ENVIRONMENTAL PROJECTS & INITIATIVES

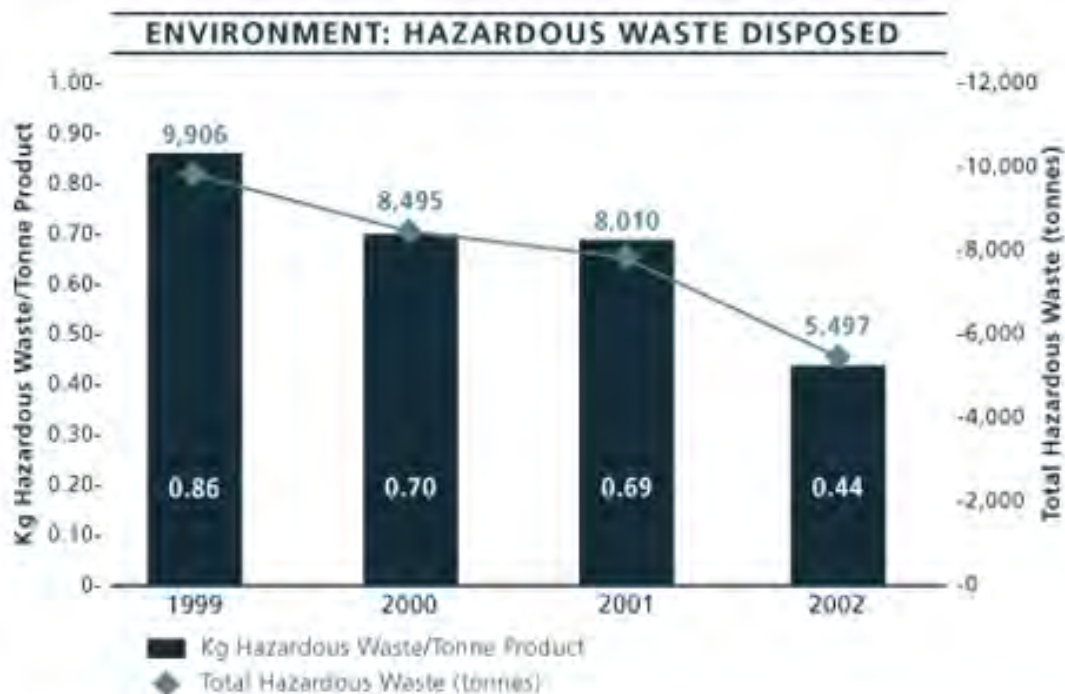
All of our facilities support various environmental programs, initiatives and special events that are driven by local regulations and specific needs. Please read more about our local environmental efforts in our [Site Reports](#) section.

## ENVIRONMENTAL PROTECTION PERFORMANCE COMPANY-WIDE

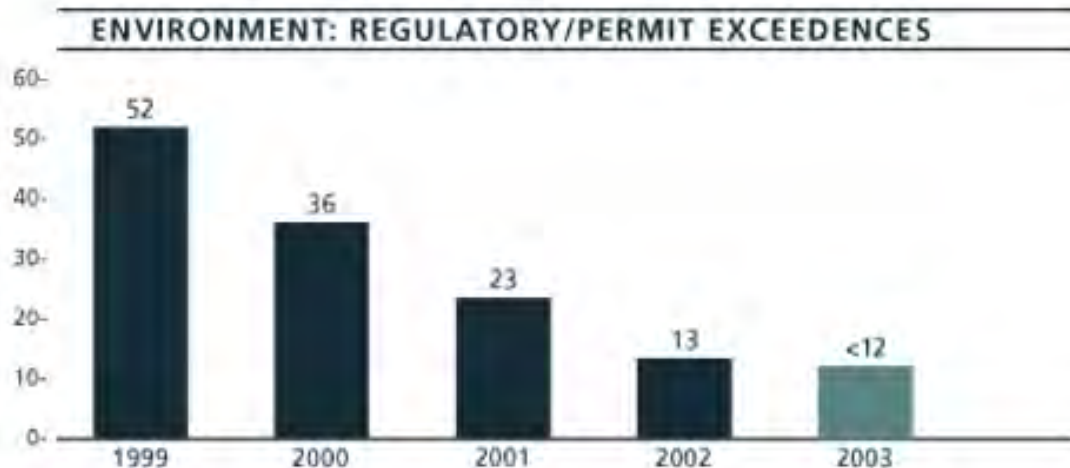
Each year, NOVA Chemicals sets company-wide targets for performance in four key areas: waste disposal, regulatory permit exceedances, greenhouse gas emissions, and hydrocarbon emissions.

# PROTECTING THE ENVIRONMENT

[CONTINUED]



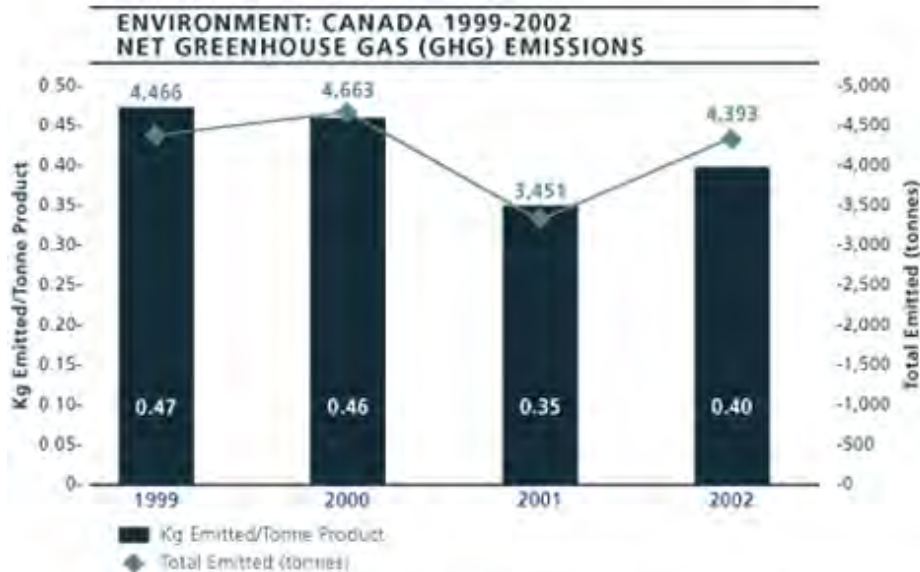
*Waste Disposal: Through reuse and recycling initiatives, NOVA Chemicals strives to limit its disposal of waste. The company's goal is to reduce hazardous waste disposal by 50% per unit of product manufactured between 1999 and 2005. NOVA Chemicals reduced hazardous wastes disposed by 45% per unit of product manufactured from 1999 to 2002.*



*Regulatory Permit Exceedences: Unusual operating conditions and unplanned equipment failures can cause a facility to temporarily exceed the limits of its operating permit. In 2002, the company had 13 exceedences, compared to 23 in 2001. Our goal for 2003 is to further reduce this number.*

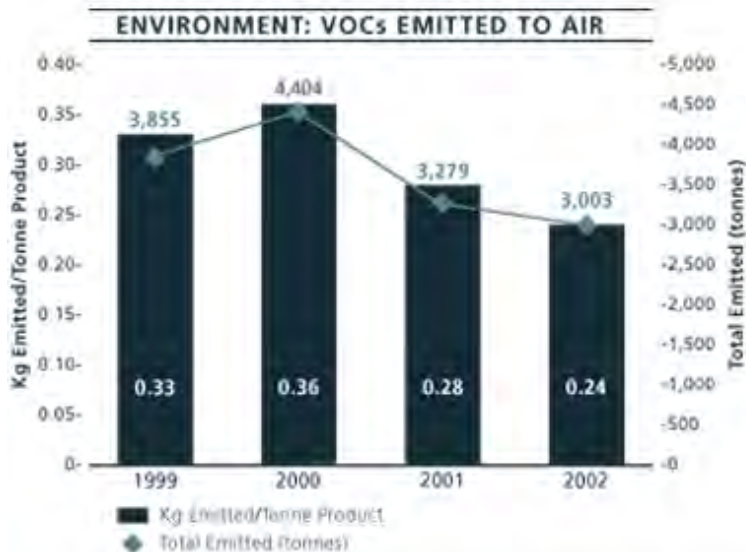
# PROTECTING THE ENVIRONMENT

[CONTINUED]



*Greenhouse Gas Emissions:* In 2000, the construction of the Joffre, Alberta cogeneration facility enabled NOVA Chemicals to significantly reduce net greenhouse gas emissions per unit of product. As indicated in the chart above, 2002 net greenhouse gas emissions intensity from Canadian operations was reduced by approximately 15% below 1999 levels.

Our goal is to reduce net greenhouse gas emissions per unit of product manufactured by 18% between 1990 and 2012. Cleaner energy, greater energy efficiency and energy conservation are the cornerstones of NOVA Chemicals' efforts to lower greenhouse gas emissions.



*Volatile Organic Compound (VOC) Emissions:* NOVA Chemicals established a 2005 target to reduce VOC emissions by 25% per unit of product manufactured from 1999 levels. As a result of various company-wide VOC reduction initiatives and lower manufacturing rates, our VOC emissions were approximately 22% lower per unit of product manufactured in 2002 compared to 1999.

## PROPERLY DISMANTLING AND REMEDIATING OLD SITES

A key part of NOVA Chemicals' corporate strategy is to be an industry consolidator. As a consequence, we have acquired a number of small, older facilities that are no longer economically and technologically sustainable.



When non-competitive or outdated facilities are identified for closure, NOVA Chemicals follows a rigorous procedure to ensure that site buildings and infrastructure are safely dismantled, and equipment and vessels are recycled or salvaged whenever possible. We thoroughly investigate site environmental conditions and then develop and implement clean-up plans in compliance with all relevant regulations to return the site to an environmental condition suitable for continued industrial use.

The process typically begins with decommissioning, which involves the shutdown of plant processes and the removal of process equipment, piping, and other structures from former manufacturing plants. Remediation -- the act of cleaning up contaminated property including soils, sediments, and groundwater -- follows when necessary. The sum of these activities is the reclamation of land to standards suitable for continued industrial activity.

NOVA Chemicals employs cost-effective, state-of-the-art technologies in pursuit of these objectives. In 1990, we established a multi-disciplinary team to manage these inactive properties and environmental liabilities. When the team was formed, a \$50 million accrual was established to address existing environmental issues at these sites. Since that time, we have been working cooperatively and voluntarily with environmental authorities in several jurisdictions. To date, we have dismantled and remediated 17 sites, and work is progressing on several others.

### APPLYING TECHNOLOGY

During the course of various dismantling, reclamation and remediation activities, NOVA Chemicals helped to identify and pioneer the use of innovative soil and groundwater treatment technologies such as biopiles, soil vapor extraction and subsurface air injection systems. These techniques are now widely accepted and utilized throughout the industry. The end result is a cost-effective method for the simultaneous remediation of soil and groundwater.

# PROPERLY DISMANTLING AND REMEDIATING OLD SITES [CONTINUED]

NOVA Chemicals continues to search for new ways to safely reduce the impact of dismantling and reclamation activities, decrease costs, and realize the capital value of the property by returning it to productive industrial use.

## ASSET RETIREMENT COST ESTIMATES PROJECT

NOVA Chemicals adopted new accounting standards effective January 1, 2003 for both Canadian and US GAAP (Generally Accepted Accounting Principles) purposes. These standards detail how a company should recognize obligations associated with the eventual retirement of operating plant property and equipment. In 2002, we conducted a review of all of our active and inactive sites and developed cost estimates for the eventual retirement of all our assets in accordance with CICA 3110 and FASB 143. The review included the cost to dismantle and remediate existing, active facilities based on their current conditions. The total estimate, excluding salvage value and the value of associated real estate, was approximately \$120 million, to be expended in the future when and if the facilities have fulfilled their normal lifecycle.

In order to ensure the estimate accurately represented the costs to comply with CICA 3110 and FASB 143 and that sufficient reserves are set aside, NOVA Chemicals retained an environmental consultant with broad experience in the chemical and petrochemical industries to undertake an audit of the asset retirement estimate. Their review determined that our estimates were accurate and that sufficient funds had been reserved to address asset retirement in accordance with the new accounting standards. It also indicated that our long-term, ongoing environmental liability is significantly less than that of our peers within the industry group.

## ACTIVE PROJECTS

### Joliet, Illinois

After completion of dismantling activities at the former polystyrene manufacturing site in December 2001, NOVA Chemicals initiated operation of a site-wide remediation program. We are using soil-vapor extraction and air-sparging systems to remove traces of ethylbenzene, naphthalene and styrene from affected soil and groundwater. The work is being performed under a voluntary state remediation program, and we anticipate that the remediation work will be completed in Q4 of 2003.

### Cambridge, Ontario

This facility was dismantled several years ago by NOVA Chemicals. In 2002, we completed pilot testing and verified that soil vapor extraction and subsurface air injection systems were appropriate to clean-up residual styrene and ethylbenzene contamination of soil and groundwater at the site. The expected completion and verification of this remediation project is Q4 of 2003.

### Copley, Ohio: Williams Landfill

This site has never been owned by NOVA Chemicals, but is the location of a former, unlicensed landfill that received all manner of waste, including polymerized polystyrene waste from a facility operated by a predecessor company. An Engineering Evaluation/Cost Analysis has been completed for the site and is currently being reviewed by the USEPA prior to the selection of a remedy for the site.

### Chattanooga, Tennessee

An inactive facility owned until 1989 by a predecessor company, this site is an approximately 25-acre wastewater lagoon system where the groundwater and soil was contaminated with industrial solvents, latex and related chemical waste. Hazardous waste materials were excavated and disposed of at appropriate off-site facilities, and an on-site landfill was constructed for the safe disposal of non-hazardous wastes. A groundwater remediation system was installed in 1998 to address the remaining contaminants, and the groundwater system has been in operation for five years.

# TRANSPORTING PRODUCTS SAFELY

Safely and efficiently transporting NOVA Chemicals' products worldwide is a significant undertaking, requiring a concerted and focused effort from the company's logistics group and manufacturing sites in cooperation with railroads, barge companies and other carriers.

To accomplish this task, the logistics team employs the transportation risk management process to assist in choosing the best methods and routes of transport; performs rigorous carrier evaluations; and thoroughly documents and investigates all incidents using the company-wide Incident Learning Process (ILP).

## ENSURING SAFE DISTRIBUTION THROUGH CARRIER EVALUATIONS

NOVA Chemicals' Logistics Safety Process is used to evaluate road, rail, marine and pipeline carriers based on the following four guidelines:

### • **Commitment:**

Carriers must provide a written commitment to transport NOVA Chemicals' products in compliance with the company's Partnerships In Commitment (PIC) Program, designed in accordance with applicable Responsible Care principles.

### • **Self-Assessment:**

Carriers are requested to complete and return a health, safety and environment self-assessment. The assessment covers employee hiring criteria, training, incident history, incident investigation, emergency response, operating and maintenance procedures, community outreach and security measures.

### • **Risk Determination Process:**

Based upon the carrier self-assessments and records of safety performance, NOVA Chemicals then completes a risk determination profile for each carrier. Action plans are developed with each carrier to address areas for improvement. Continuity of business with the carrier is dependent upon their response to the required actions.

### • **Field Assessment:**

NOVA Chemicals personnel or contractors pay visits to and assess the facilities and operation of selected carriers, such as those that transport hazardous materials.



NOVA Chemicals' Joffre, Alberta, railyard has the capacity to store more than 1,500 railcars.

# TRANSPORTING PRODUCTS SAFELY [CONTINUED]

## **RAILCAR SPECIFICATIONS & SAFETY**

**NOVA Chemicals' Railcar Specifications Committees** work to ensure that specifications for the company's fleet of tank and hopper cars are uniform and consistent, and meet or exceed all regulatory standards. NOVA Chemicals' philosophy is that when all cars have similar equipment, the processes of loading, shipping, and unloading are easier and safer. The specifications for all NOVA Chemicals tank and hopper cars were reviewed and revised by the committees in 2002, in compliance with the Responsible Care requirement that all specifications must be reviewed at regular intervals. In addition, all maintenance providers that repair tank cars used to haul dangerous goods for NOVA Chemicals must also be participating members in the PIC Program.

Implementation of the Railcar Inspection Program for plant sites also began in 2002. The program will establish a uniform minimum standard for railcar inspection at all NOVA Chemicals facilities and maintain uniform records of these inspections. This program requires participating sites to train individuals on NOVA Chemicals' inspection procedure, document the training and record all inspections.

## **INDUSTRY ASSOCIATIONS**

### **TRANSCAER®**

Transportation safety is a shared responsibility under Responsible Care and is accomplished through partnerships between chemical companies and carriers. We participate in Transportation Community Awareness and Emergency Response (TRANSCAER), a voluntary national outreach effort that focuses on assisting communities in preparing for a possible hazardous material transportation incident. As a participant in TRANSCAER, NOVA Chemicals works to reduce chemical transportation incidents, provides emergency response assistance in the event of an accident and helps to educate the public and emergency responders (such as police, fire and ambulance departments) about the safe and responsible transportation and handling of hazardous materials.

NOVA Chemicals participates in the Pennsylvania TRANSCAER Team, which was awarded the 2002 National TRANSCAER Regional Approach Award for their 2002 hazardous materials response training program. The PA TRANSCAER Team conducted the training free of charge for first responders in five Pennsylvania counties throughout 2002.



NOVA Chemicals is a member of both the Association of American Railroads (AAR) and its subsidiary, the Bureau of Explosives (BOE). While these organizations are not regulatory bodies — hazardous material transportation via rail is administered by the Federal Railroad Administration (FRA) division of the DOT— the AAR and BOE are recognized as experts on railway equipment standards and safe practices. In particular, the BOE is focused on enhancing and maintaining safe transportation in the railroad industry. As a participating company, NOVA Chemicals must have trained operators and rail and tank car loading/unloading procedures in place. Similarly, there must be trained inspectors, a standard procedure for inspecting railcars and documentation of these inspections. When requested, the BOE conducts independent inspections to ensure compliance with these requirements.



# TRANSPORTING PRODUCTS SAFELY [CONTINUED]

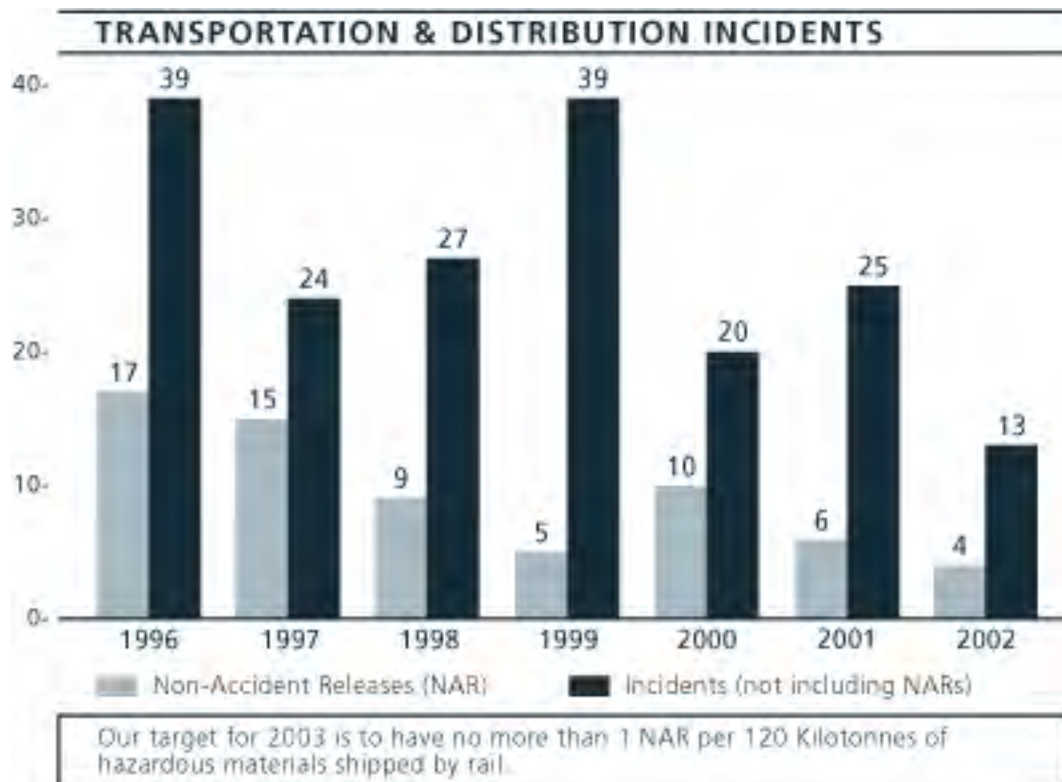
## TRANSPORTATION SAFETY PERFORMANCE COMPANY-WIDE

One of NOVA Chemicals' key measures of safe transportation is the number of Non-Accident Releases (NARs). These are instances when a release of hazardous material occurs from a railcar during transport that could have been prevented by maintenance or inspection. Releases usually involve small amounts of material, often as little as 250 milliliters. NOVA Chemicals has shown a consistently strong reduction in NARS since the mid 1990s, dropping from an average of 20 per year to ten in 2000, six in 2001 and four in 2002.

## RECOGNITION FROM THE RAILROADS

NOVA Chemicals was honored with Rail Safe Handling Awards for 2002 for the safe movement of hazardous materials from the following railroads:

- Canadian Pacific Railway
- Kansas City Southern Railway
- CSX Transportation
- Norfolk Southern Railway



# MAINTAINING AND ENHANCING FACILITY SAFETY AND SECURITY

Emergency preparedness and security are cornerstones of NOVA Chemicals' Responsible Care program.



NOVA Chemical's emergency response vehicles.

Our emphasis is on prevention, but as a chemical manufacturer we recognize that each plant must be ready to respond to crisis situations in order to protect the safety of our workers, the community and the environment. The company's Emergency Preparedness and Security Council ensures that we have appropriate plans and procedures in place to manage security issues emergencies or crises at all facilities.

## HEIGHTENED SECURITY

In the aftermath of September 11, 2001, NOVA Chemicals has continued to increase its emphasis on security. Internal security, emergency preparedness, and global security standards continue to be reviewed and strengthened. All of NOVA Chemicals' plants are regularly assessed against these enhanced standards.

Our company has shared these internal improvements in partnership with other chemical producers to develop mandatory security standards for the chemical industry. A major

milestone in 2002 was approval of the Responsible Care Security Code for all member companies.

In compliance with the ACC's new Security Code, NOVA Chemicals selected the Center for Chemical Process Safety's Security Vulnerability Assessment (SVA) for use at our facilities worldwide. The company piloted the SVA at our Sarnia, Ontario, Canada site in November 2002. All NOVA Chemicals sites will complete the SVA in 2003 in accordance with ACC requirements, and any necessary improvements will be implemented by 2005.

## INFORMATION PROTECTION AND CYBERSECURITY

Information protection and integrity are of paramount importance in today's workplace. In 2002, NOVA Chemicals updated our Global Security Plan to include information technology and cybersecurity responses. We will continue to review our cybersecurity policies and practices to align them with ISO-17799. We also updated our

# MAINTAINING AND ENHANCING FACILITY SAFETY AND SECURITY

[CONTINUED]

corporate anti-virus program to include additional protection for our servers, desktop computers and e-mail system.

Late in the year we answered a call for support from the American Chemistry Council and the Chemical Industry Data Exchange to help develop new cybersecurity guidelines. These principles will be incorporated into our existing Responsible Care Guidelines.

## EMERGENCY PREPAREDNESS

NOVA Chemicals' planning process for an emergency or crisis situation is comprehensive. It encompasses the site and surrounding areas, other industries in the vicinity, the community, transportation routes and ancillary facilities. Our strategic, three-tiered approach includes site planning and response, crisis management, and NOVA Chemicals' Logistics Emergency Response Team (NOVALERT).

## SITE PLANNING & RESPONSE

All NOVA Chemicals facilities are required to have a documented Emergency Response Plan. Each site's emergency response plan addresses the risks and hazards related to its operation and must comply with applicable regulations. These plans must clearly define the roles, equipment and internal and external resources necessary to manage responses to emergency situations.

To advance these goals, NOVA Chemicals has adopted the Canadian Standards Association's CAN/CSA Z731 - Emergency Preparedness Standard as the basis for our internal Responsible Care Emergency Preparedness standard. This Canadian standard establishes practices, ranging from training and protocols to debriefing company leaders, community officials and others after an event. In many areas NOVA Chemicals exceeds Standard Z731. Each site rigorously tests its emergency systems on a regular basis.

## NOVALERT

NOVA Chemicals' Logistics Emergency Response Team (NOVALERT) developed a world-class program to respond to off-site transportation incidents. Composed of 32 technical advisers, the team supports the first emergency personnel to arrive at the scene of an off-site transportation incident. The team is on-call 24-hours-a-day and distributed on a regional basis so they can quickly respond to any situation.

Members of NOVALERT were called into action on May 2, 2002, when 20 railcars on a CN train derailed and caught fire approximately 30 miles west of Portage La Prairie, Manitoba. Fourteen of the derailed cars were carrying materials manufactured by NOVA Chemicals. Four of these cars carried liquid aromatic hydrocarbons and ten carried polyethylene resin. Two NOVALERT Team members were sent to the incident scene to



Mock fire training at a NOVA Chemicals facility.

# MAINTAINING AND ENHANCING FACILITY SAFETY AND SECURITY

[CONTINUED]

provide guidance and technical expertise about the potential hazards of and safe handling procedures for NOVA Chemicals products. There were no injuries as a result of this accident.

The European NOVALERT program was launched in October 2001 and is now managed from the Manchester, England facility. NOVA Chemicals has nine technical advisers, two of which are Dangerous Goods Safety Advisors as required by European law for any company that is involved in the manufacture, handling, storage or shipping of dangerous goods. The technical adviser coverage will be reviewed in 2003. Through a contract with the U.K.'s National Chemical Emergency Centre (NCEC), the program provides a live emergency number and interpreter service for 37 destination countries and nine languages with 24-hour-a-day coverage.

In 2002, the European NOVALERT team reviewed and revised procedures for strapping dangerous goods, and performed extensive testing on the integrity of fibreboard product packaging.

## CRISIS MANAGEMENT

In the event of an emergency, NOVA Chemicals' Crisis Management Team provides strategic and technical support to on-site personnel. The team



Emergency response drill at a NOVA Chemicals' facility.

guides the emergency response, communicates with the media, and addresses immediate business concerns. NOVA Chemicals' Crisis Management Center is located at the U. S. Operations Center in Pittsburgh, PA. In 2002, two crisis drills were conducted at the company's Joffre, Alberta facility to test and further refine the company's Crisis Management Plan and emergency response capabilities.



NOVA Chemicals' employees participating in a training session on the proper use of fire extinguishers.

# PARTNERING WITH OUR COMMUNITIES

NOVA Chemicals works to build strong, positive and open relationships in every community in which we operate.

For that reason, we take numerous steps to share information about our facilities, operations, products and the measures taken to protect workers, neighbors and the environment. Most importantly, we strive to understand and respond to the concerns of residents and local communities.

## COMMUNITY ADVISORY PANELS

The heart of NOVA Chemicals' efforts to reach out to local communities is a system of liaison and outreach groups, or Community Advisory Panels (CAP). Comprised of community residents and leaders, these committees help our manufacturing sites keep neighbors informed about topics such as emergency response plans and capabilities, environmental performance, unique operating conditions or changes that may be of concern. Community representatives voice concerns and help the company communicate more effectively with our neighbors. Many sites use newsletters, bulletins and handouts on specific topics to further enhance communication between facility personnel and the community. To learn more about CAPs and other community outreach activities at the local level, please refer to our menu of site-specific reports.

## EDUCATING LOCAL COMMUNITIES: A CORNERSTONE OF RESPONSIBLE CARE

In addition to providing information about plant operations, NOVA Chemicals strives to educate communities about what we do and the value of our products. Many of these benefits are discussed in the "How Our Products Help Improve the Quality of Everyday Life" section of this website.

Our manufacturing sites also regularly sponsor activities and events that are of general interest to community members. For example, we actively encourage children to become involved in science by sponsoring events such as career fairs and scholarship contests. To learn more about local outreach activities, please refer to our site-specific reports.



NOVA Chemicals' employee helps local school children test the pH balance of river water at the Indian Orchard, MA facility.

NOVA Chemicals' sites participate in numerous community initiatives and support charitable organizations. For a review of events and highlights, please refer to our site-specific reports.

# EVALUATING AND IMPROVING OUR PERFORMANCE

NOVA Chemicals uses company-wide and site-specific tools and systems to evaluate performance and promote continuous improvement in our environment, health and safety programs.

## INTERNAL AUDIT SYSTEMS

The NOVA Chemicals Responsible Care Audit Program evaluates each facility's performance, operations and management systems against the company's Responsible Care Standards and applicable regulatory requirements. These Standards are then implemented through facility-based processes and procedures to ensure every facility adheres to the minimum requirements of Responsible Care.

NOVA Chemicals' specially-trained internal audit teams conduct regular assessments of the environmental, health and safety management systems at each location. An audit team often includes personnel from other NOVA Chemicals facilities, enabling plants to share information on best practices. External auditors are systematically employed to help achieve the most detailed and objective audits possible.

The auditors assess and report on the site's conformance with Responsible Care Standards and local regulatory requirements. The audit team reviews its findings with the plant leadership team and establishes the "audit opinion" or ranking. The facility is then required to establish a corrective action plan, including a target completion date. The completion status of corrective actions is tracked and regularly reported to NOVA Chemicals' Responsible Care Council, all levels of management and the Board of Directors.

We also utilize external consultants to independently assess the effectiveness of the company's Responsible Care Audit Program and management systems.



## FACILITY SELF-ASSESSMENT

In addition to meeting the requirements of company-wide Standards, each NOVA Chemicals site is responsible for effective compliance with local regulations. NOVA Chemicals' new Facility Self-Assessment (FSA) program was created to supplement the existing Responsible Care Audit Program. This program allows sites with different environment, health and safety requirements to effectively self-evaluate both their regulatory compliance and accompanying management systems. Individual facilities develop and administer the program, which requires sites to evaluate and validate their compliance with all applicable regulatory requirements. At the discretion of individual sites, the program may be expanded to include company Responsible Care Standards.

The FSA program teams include plant operators and maintenance personnel as well as Responsible Care professionals. FSAs cover all areas of the plant and operations, including: plant operations, control rooms, laboratories, offices, administrative buildings, receiving, shipping and storage facilities. Our company is implementing this program at all sites.

# EVALUATING AND IMPROVING OUR PERFORMANCE [CONTINUED]

## RESPONSIBLE CARE® VERIFICATION

NOVA Chemicals gains access to independent, third party opinions about our environment, health and safety performance through voluntary membership in industry associations. As a member of both the Canadian Chemical Producers' Association (CCPA) and the American Chemistry Council (ACC), NOVA Chemicals engages an independent third party verification to demonstrate compliance with Responsible Care, as required for all member companies. The company's processes were initially verified by the CCPA in 1994 and the ACC in 1998, and these assessments certify that NOVA Chemicals is in full compliance with the Responsible Care Codes of Practice.

In 2002, the Canadian Chemical Producers' Association (CCPA) re-assessed NOVA Chemicals' Responsible Care management systems and concluded that they meet the requirements of the Responsible Care ethic. The CCPA's re-verification team examined our management systems by studying documentation and then conducting interviews with employees and neighbors in the surrounding communities at six of our Canadian locations. The subsequent report commended the company for exemplary work, identified findings and offered suggestions for continuous improvement. Progress on resolution of findings will be reported to the CCPA upon completion in 2003.

External consultants also completed an evaluation of the Corporate Responsible Care Audit program in 2002. Their report concluded:

**"... NOVA Chemicals Responsible Care® Audit Program is progressive, soundly designed, and effectively implemented. We believe it is one of the leading programs and is highly rated when compared to other programs with which we are familiar. It is definitely in the top quartile and probably in the top decile."**

## AUDIT PERFORMANCE COMPANY-WIDE

In 2002, NOVA Chemicals personnel conducted 23 Responsible Care audits to measure operational performance and compliance with regulatory and internal health, safety and environmental requirements.

## AUDIT OPINION DEFINITIONS

The effectiveness of programs for each of 15 identified Responsible Care areas is assessed and then assigned one of the following five possible audit opinions:

**Ensures Compliance** when systems are deemed effective to deliver a high degree of compliance and the facility meets virtually all requirements.

**Substantially Ensures Compliance** when generally strong systems are in place and requirements are met with only a few isolated exceptions.

**Generally Ensures Compliance** when deficiencies are noted in management systems and applicable requirements are not all being met.

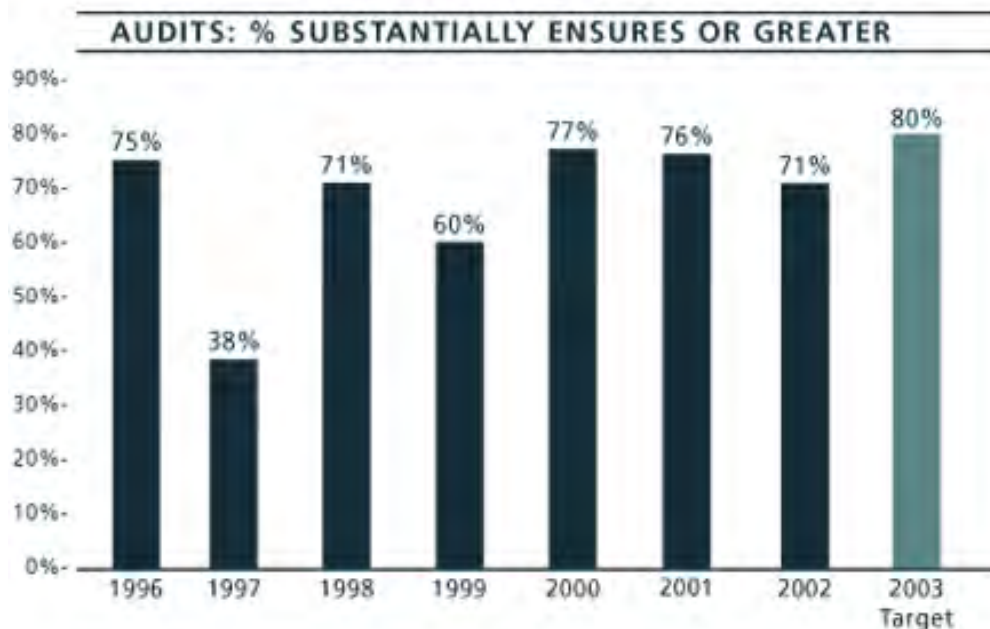
**Requires Improvement to Ensure Compliance** when several deficiencies are noted in the management systems and performance and some of these reflect the absence of required programs.

**Requires Substantial Improvement to Ensure Compliance** when many deficiencies are noted and several significant departures from established criteria are involved.

# EVALUATING AND IMPROVING OUR PERFORMANCE [CONTINUED]

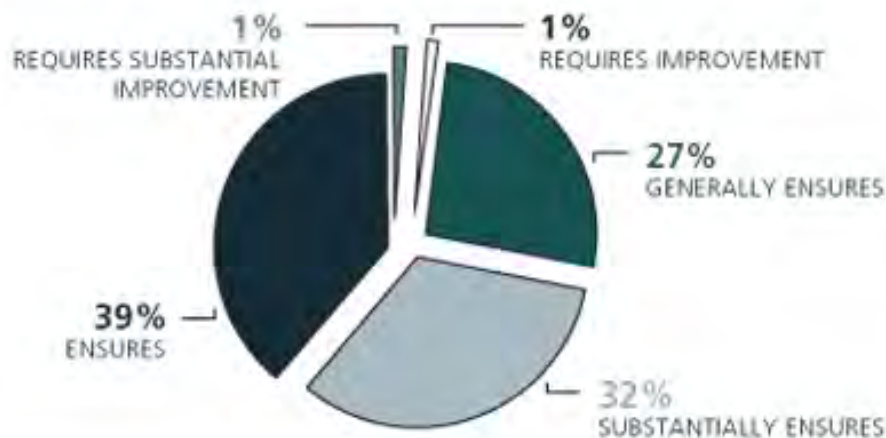
In 2002, 98% of NOVA Chemicals' Responsible Care audits were rated at "Generally Ensures Compliance" or higher. 71% of the 2002 audits reported performance at the "Substantially Ensures Compliance" level or above. This level of

performance did not quite meet the target of greater than 80% within that range. For 2003, NOVA Chemicals has set a target of 80% of audit opinions rated "Substantially Ensures Compliance" or higher.



Responsible Care audits conducted for benchmarking purposes at facilities which have not been previously audited have not been included in the performance data reported for 2002.

**2002 AUDIT OPINIONS**



Responsible Care audits conducted for benchmarking purposes at facilities which have not been previously audited have not been included in the performance data reported for 2002.



# EVALUATING AND IMPROVING OUR PERFORMANCE [CONTINUED]

<b>NOVA CHEMICALS' RESPONSIBLE CARE PROGRAM Key Performance Measures and Target Summary</b>				
<b>MEASURES</b>	<b>2001 Actual</b>	<b>2002 Target</b>	<b>2002 Actual</b>	<b>2003 Target</b>
<b>Incident Summary</b>				
Percent of Critical Incidents + Major Incidents + Serious Incidents vs. Total Number of Incidents of all classifications	5.7%	<5.0%	4.6%	<5.0%
<b>Occupational Safety</b>				
Away from Work Case Rate (AWCR) Employees	0.15	<0.08	0.13	0
Away from Work Case Rate (AWCR) Contractors	0.04	<0.25	0	0
Total Recordable Case Rate (TRCR) Employees	1.12	<1.10	1.30	<1.00
Total Recordable Case Rate (TRCR) Contractors	2.36	<2.25	2.49	<2.00
<b>Environment</b>				
Number of Regulatory/Permit Exceedances	23	<14	13	<12
Hazardous Waste (with water) Disposed per Unit Quantity of Product Manufactured (kg/tonne)	0.69	50% reduction (1999-2005)	.44	50% reduction (1999-2005)
Volatile Organic Compounds (VOC) Released per Unit Quantity of Product Manufactured (kg/tonne)	0.28	25% reduction (1999-2005)	.24	50% reduction (1999-2005)
Net Greenhouse Gases (CO <sub>2</sub> equivalents) Released per Unit Quantity of Product Manufactured (tonne/tonne)	.37	25% reduction (1999-2005)	.40	50% reduction (1999-2005)
<b>Product Stewardship</b>				
Percent of Selected Major Business Partners participating in the Partnerships in Commitment (PIC) Program (Suppliers/ Customers) North American and European Carriers and Off-site Facilities	91%	>90%	93%	>90%
<b>Transportation Safety</b>				
Number of Non-Accident Transportation Releases (NAR) of Hazardous Materials per Unit Quantity (Kt.) Shipped by Rail	1/127	1/120	1/139	<7 (1/120)
<b>Audit</b>				
Percent of Total Audit Opinions rated at least "Substantially Ensures"	76%	>80%	71%	>80%

## FOR ADDITIONAL INFORMATION

For all Responsible Care inquiries, please contact Nigel Clark, Director of Responsible Care at NOVA Chemicals.

E-mail: [clarknj@novachem.com](mailto:clarknj@novachem.com)



NOVA Chemicals is a registered trademark of NOVA Brands Ltd.;

ARCEL® is a registered trademark of NOVA Chemicals Inc.  
DYLARK® is a registered trademark of NOVA Chemicals Inc.  
DYLITE™ is a registered trademark of NOVA Chemicals Inc.  
NOVAPOL® is a registered trademark of NOVA Brands Ltd.  
STYROSUN® is a registered trademark of NOVA Chemicals Inc.  
ULTRA-LOW™ pentane is a registered trademark of NOVA Chemicals Inc.  
ZYLAR® is a registered trademark of NOVA Chemicals Inc.  
ZYNTAR® is a registered trademark of NOVA Chemicals Inc.

Office Athlete™ is a registered trademark of Ergo Health Systems, Inc.  
Medgate™ is a registered trademark of Medgate, Inc.  
Responsible Care® is a registered trademark of the American Chemistry Council (ACC) and the Canadian Chemical Producers' Association (CCPA).  
TransCAER® a registered trademark of the American Chemistry Council  
VISIONS™ is a registered trademark of Metegrity, Inc.

# PROFILE OF NOVA CHEMICALS CORPORATION

NOVA Chemicals is a focused, commodity chemical company that produces ethylene, polyethylene, styrene monomer and styrenic polymers, which are used to manufacture a wide range of consumer and industrial goods. NOVA Chemicals distributes its products from 18 operating facilities that include: eight sites in the United States, six locations in Canada, two in France, one in the Netherlands and one in the United Kingdom. The company also has five technology centers that support research and development initiatives. NOVA Chemicals Corporation shares trade on the Toronto and New York stock exchanges under the trading symbol NCX.

Visit NOVA Chemicals on the Internet at [www.novachemicals.com](http://www.novachemicals.com)

## EMPLOYEES

4,300 worldwide ANNUAL SALES  
2002 Revenues — \$3.1 billion

## CORPORATE OFFICES

Calgary, Alberta  
Corporate Head Office

Pittsburgh, Pennsylvania  
U.S. Operating Center

## RESEARCH SITES

- Breda, The Netherlands
- Calgary, Alberta
- Chesapeake, Virginia
- Monaca, Pennsylvania

## PLANT LOCATIONS

### Canada

- Corunna, Ontario
- Joffre, Alberta
- Montreal, Quebec
- Moore Township, Ontario
- Sarnia, Ontario
- St. Clair River, Ontario

### USA

- Bayport, Texas
- Belpre, Ohio
- Channelview, Texas
- Chesapeake, Virginia
- Decatur, Alabama
- Monaca, Pennsylvania
- Painesville, Ohio
- Springfield, Massachusetts

### Europe

- Berre, France
- Breda, The Netherlands
- Carrington, England
- Ribecourt, France

## PRODUCTS

### Styrene

Styrene monomer is the primary raw material in producing solid polystyrene and expandable polystyrene. NOVA Chemicals is the largest styrene monomer producer in North America, and the 4th largest worldwide. Solid Polystyrene (SPS) CD and DVD cases, food and cosmetic packaging, medical devices, office accessories, television cabinets and other electronics products are made with solid polystyrene (SPS). NOVA Chemicals is the co-leader in SPS in North America, the 6th largest in Europe, and the 4th largest worldwide.

### Expandable Polystyrene (EPS)

NOVA Chemicals is the largest expandable polystyrene (EPS) producer in North America, the largest in Europe, and the 2nd largest in the world. EPS is used to make construction materials, foam cups and food packaging.

### Ethylene

Ethylene is the primary feedstock for the production of polyethylene. NOVA Chemicals is the 5th largest ethylene producer in North America and the 10th largest worldwide.

### Polyethylene

Grocery bags, garbage bags and shrink-wrap are made from linear low-density polyethylene (LLDPE). Low-density polyethylene (LDPE) is used in squeezable bottles, foam packaging and cable insulation. High-density polyethylene (HDPE) is found in industrial drums and children's toys. NOVA Chemicals is the 5th largest polyethylene producer in North America, and the 9th largest worldwide.

### Petrochemical Co-Products

NOVA Chemicals produces petrochemical co-products used internally or sold to industrial customers as fuel, or for manufacturing chemicals, speciality resins, synthetic rubbers, inks, adhesives, coatings and other products.



## HOW OUR PRODUCTS ADD TO THE QUALITY OF LIFE

Take a minute to think about all of the plastic products that you use and encounter every day. NOVA Chemicals' polyethylene and polystyrene products are used in places and situations that are so common, they may not be obvious, but without them our lives would be very different. In addition, many of our products are used in ways that allow us to save energy, lower emissions and conserve natural resources — all in accordance with Responsible Care principles.

### AT HOME

#### Food Packaging

Grocery shopping without any polyethylene? It's almost impossible. NOVA Chemicals' products help keep food fresher longer, and also help carry it home. Our polyethylene is used in frozen food packaging, meat, poultry and cheese packaging and clear fresh produce packaging and bags to protect the food from germs and other contaminants. Foam meat trays are made from crystal polystyrene, while the clear plastic wrap on top is made from polyethylene film. Polystyrene can be found in other applications such as egg cartons, soup bowls, coffee cups, and plastic utensils. Polyethylene also is used to make squeezable bottles for ketchup, shampoo and soaps, providing the shatter-resistance that glass packaging doesn't offer. Many common kitchen items such as can openers and coffeemakers are made with our advanced styrenic polymers, such as NOVA Chemicals' FX 550, which is designed specifically for small appliances and housewares.

#### Insulation & Packaging Material

Plastics are not only in your home, they may actually be a part of your home. Foamed plastic insulation (made of polystyrene) helps to reduce heating bills as well as greenhouse gas (GHG) emissions. Structural insulated panels, made from expandable polystyrene (EPS) sandwiched between two pieces of oriented strand board, are used in the construction of floors, walls and roofs. Use of structural insulated panels in a home can result in heating and cooling energy savings of 50% over the lifetime of the house. Also, they are stronger than conventional stud walls, can reduce construction time and can minimize moisture and insect infiltration.

Insulated concrete forms, used in commercial buildings and homes, are multi-layered wall systems also containing EPS and are strong and energy-efficient.

### ON THE ROAD

Geofoam blocks made of EPS are used as insulation on highways, as fill for embankments and to stabilize slopes along roadways. Speaking of driving, have you ever thought about how much plastic is in your car? Automobiles are now made with strong, durable, lightweight polymers that improve gas mileage. NOVA Chemicals' DYLARK® resin is used in instrument panels and auto trim, while ARCEL® resin is used in infant car seats.



## HOW OUR PRODUCTS ADD TO THE QUALITY OF LIFE [CONTINUED]



### IN ELECTRONICS

NOVA Chemicals' polystyrene is used in numerous electronics products. For example, NOVA Chemicals' ZYNTAR® resin offers ignition-resistance in television and computer housings, thereby reducing the potential for fires.

### ULTRA-LOW™ PENTANE EPS RESIN REDUCES CUSTOMERS' EMISSIONS

Most standard EPS resins contain approximately 6% pentane, which is added as a blowing agent to expand the bead into foam. During processing of EPS, pentane can be emitted into the environment. As air quality regulations continue to become more common and stringent, the demand for low Volatile Organic Compound (VOC) EPS products will increase. NOVA Chemicals' new ULTRA-LOW pentane EPS contains approximately 3% pentane, and significantly reduces emissions at customer locations. In fact, NOVA Chemicals is working on technology that will eliminate pentane from the foam expansion process, using water as the primary blowing agent in processing EPS resin into foamed parts.

### AT PLAY

Polystyrene foam is used to line bicycle helmets to provide added protection. NOVA Chemicals' ARCEL® resin is used to make sporting goods and recreational products, such as the popular "boogie board." Due to its flexibility, polyethylene is used to manufacture many children's toys, including sandboxes, tricycles, and art easels.



## HOW OUR PRODUCTS ADD TO THE QUALITY OF LIFE [CONTINUED]

### ZYLAR® RESIN AND OTHER PLASTICS BRING LIFE TO MEDICAL APPLICATIONS

Plastics usage in the medical market continues to grow because of safety demands and increasing cost concerns. NOVA Chemicals' ZYLAR resin and crystal polystyrene grades are approved for use in many medical products. These polymers reduce the costs for devices such as medical tubing, intravenous components, labware, respiratory systems, and diagnostic kits while maintaining the performance characteristics so critical in life-saving medical applications. Other high-impact polystyrene grades are used to make lancets, syringe hubs, and thermoformed trays for medical kits. Select polyethylene resins are used in pharmaceutical and medical packaging such as pill bottles and child-resistant closures.



### STYROSUN® RESIN HELPS SAVE OUR FORESTS

STYROSUN resin is a weather-resistant polystyrene that is replacing wood as the raw material in many products. Manufacturers of decks, railings, moldings, outdoor furniture and other "plastic lumber" products are discovering its resistance to damaging ultraviolet (UV) radiation. STYROSUN also reduces the reliance on lumber to make these products.

STYROSUN resin also is used in other outdoor applications such as building and construction elements telecommunications equipment, transportation and recreational vehicles, outdoor signage, billboards and sports equipment.



### NOVAPOL® RESIN RECYCLING

NOVAPOL HDPE resins are used in plastic milk jugs, juice bottles, and other beverage containers, and many of these items are now being recovered and reprocessed for reuse in packaging. These recycled products also are being used to make new durable garden and construction products such as decking, posts and marine piers. For example, the Alberta Milk Container Recycling Program is a voluntary stewardship program supported by the provincial dairy industry and operated in partnership with 135 Alberta municipalities. The plastic from an estimated 27 million milk containers (largely HDPE jugs) is recovered and reused annually.