PERFORMANCE REPORT

Natural Resources Canada

For the
period ending
March 31, 1997

Improved Reporting to Parliament
Pilot Document

Canada

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Foreword

On April 24, 1997, the House of Commons passed a motion dividing what was known as the *Part III of the Estimates* document for each department or agency into two documents, a *Report on Plans and Priorities* and a *Departmental Performance Report.* It also required 78 departments and agencies to table these reports on a pilot basis.

This decision grew out of work by Treasury Board Secretariat and 16 pilot departments to fulfil the government's commitments to improve the expenditure management information provided to Parliament and to modernize the preparation of this information. These undertakings, aimed at sharpening the focus on results and increasing the transparency of information provided to Parliament, are part of a broader initiative known as "Getting Government Right".

This ***Departmental Performance Report*** responds to the government's commitments and reflects the goals set by Parliament to improve accountability for results. It covers the period ending March 31, 1997 and reports performance against the plans presented in the department's *Part III of the Main Estimates* for 1996-97.

Accounting and managing for results will involve sustained work across government. Fulfilling the various requirements of results-based management – specifying expected program outcomes, developing meaningful indicators to demonstrate performance, perfecting the capacity to generate information and report on achievements – is a building block process. Government programs operate in continually changing environments. With the increase in partnering, third party delivery of services and other alliances, challenges of attribution in reporting results will have to be addressed. The performance reports and their preparation must be monitored to make sure that they remain credible and useful.

This report represents one more step in this continuing process. The government intends to refine and develop both managing for results and the reporting of the results. The refinement will come from the experience acquired over the next few years and as users make their information needs more precisely known. For example, the capacity to report results against costs is limited at this time; but doing this remains a goal.

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Natural Resources Canada

Performance Report

For the
period ending
March 31, 1997

Ralph Goodale
Minister of Natural Resources Canada

Natural Resources Canada

Who We Are

Natural Resources Canada is a federal government department that specializes in the areas of energy, minerals and metals, forests and earth sciences. We bring a national and international perspective, as well as scientific and policy expertise, to bear on natural resources issues of importance to Canada.

Our Vision

We will provide the leading-edge science, knowledge and expertise to position Canada as a world leader in the sustainable development of its land, energy, forest and mineral resources, and as a quality producer of resource-related products, technologies, research and services.

What We Do

Natural Resources Canada provides four main services to Canadians. We:

- conduct leading-edge science to generate and transfer the ideas, knowledge, and technologies that Canada needs to use its resources wisely and efficiently, reduce costs, protect the environment, and help Canadians create new products and services;
- build a national knowledge infrastructure on Canada's land and resources, providing Canadians with easy access to the latest economic, environmental and scientific information from a variety of sources;
- ensure that federal policies and regulations in areas such as the environment, trade, the economy, science and technology, Aboriginal matters and federal lands will foster resource-based contributions to Canada's economy, while protecting the environment and the health and safety of Canadians; and
- promote Canada's international interests, in cooperation with international agencies and other nations, in order both to meet Canada's international commitments regarding natural resources, and to maintain access to global markets for Canadian products, technologies, research and services.

How We Work

Our management philosophy commits us to:

- maintain integrity in the conduct of our work;
- provide dedicated and efficient service to Canadians;
- ensure our programs and priorities respond to the needs of our clients;
- build partnerships with provincial, territorial, and federal government agencies and with industry, Aboriginal groups, universities, environmental organizations and other countries; and
- recognize and support the development of our employees.

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I Minister's Message

Canada's vast natural resources are an integral part both of its heritage and its continuing economic health. My commitment, as Minister of Natural Resources, is to ensure that these riches are developed for the maximum benefit of Canadians in ways that will sustain our renewable and non-renewable resources and protect the environment.

This is a commitment to build on Canada's established reputation as a leader in the sustainable development of its energy, forest and mineral resources, and in the geographic and geoscientific knowledge of its landmass. Natural Resources Canada (NRCan) will continue to contribute to that leadership role by fostering modern high-technology resource industries that are environmentally sound and economically viable — in short, development that promotes the integration of economic, environmental and social goals.

During its first mandate, this Government focused on managing the economy and putting the policy fundamentals in place for long-term economic and social development. NRCan responded by making changes to enable the department to contribute significantly to the Government's agenda and the well-being of Canadians. NRCan, reoriented as a sustainable development department focused on federal responsibilities, has a firm foundation and is poised for action in all its areas of responsibility as the Government enters its second mandate. The challenge is to find ways to gather and use Canada's resources efficiently and to minimize negative environmental impacts.

The natural resources sector continues to be a mainstay of the economy, accounting for nearly 14 percent of the GNP and 38 percent of Canada's exports. It provides one of the largest sources of highly paid jobs in the economy, employing about 750,000 Canadians directly and supporting another one million jobs in related or spinoff industries.

NRCan researchers and scientists are committed to strong *partnerships* with other governments, academia and the private sector to develop and commercialize new industrial processes and technologies. The aim is to boost Canada's competitiveness, and maintain the natural resources sector's strong contribution to Canada's annual trade surplus and to resource-based job opportunities.

Few sectors have more real and potential impact on the environment, yet few are more important to the economic and social well-being of every region of the country than the natural resources sector. We are very conscious of our *environmental stewardship* role. All our actions must proceed within the context of environmental protection.

Climate change is the key sustainable development challenge in this country. NRCan, along with Environment Canada, provides leadership in the reduction of greenhouse gas emissions by federal

departments through energy efficiency and the use of alternative energy sources. It promotes export of environmental technologies and knowledge for sustainable development. The department also supports national and international development of criteria and indicators for sustainable forest management and champions negotiation of an International Forests Convention and a National Forest Strategy.

Canada's science and technology capabilities place it among world leaders in fields such as earth sciences, remote sensing, minerals and metals, forestry and energy efficiency.

All our activities employ technology in their planning and execution. Canada is in the midst of a transition to a *knowledge-based economy and society*, and its success depends on how well government, firms and individuals manage knowledge. NRCan has the knowledge and innovation in place that supports sustainable development, jobs and growth in an environmentally-sensitive economy. The challenge is to manage and make as accessible as possible the department's scientific, economic, statistical and related knowledge.
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At the community level, NRCan is supporting Aboriginal groups as they move toward self-government by assisting them in the sustainable development of their resources. It is also helping by providing services such as legal surveys for land claims agreements.

As well, NRCan is playing a key role in the economic renewal of the 500 rural and remote communities directly involved with the resource sector. It is promoting natural resource opportunities, championing the Community Atlas project to help communities gain knowledge and information on sustainable development decision making and is signing agreements with partners for ten model forests.

This performance report recounts the actions, initiatives, plans and accomplishments of the department as part of the Government's commitment to transparency and accountability. NRCan was one of 16 departments participating in a pilot project to streamline and improve reporting procedures in 1996-97. Based on the response to the new reports, all departments now are producing performance reports in support of the government's firm belief that Canadians have a right to know and to assess government performance. They are also an excellent evaluation tool for the departments themselves. Reviewing and assessing their accomplishments contributes to wise decision making.

The activities planned and under way place the natural resources portfolio in the mainstream of government action on job creation, economic growth, environmental stewardship, knowledge and innovation and with Aboriginal and rural communities.

It is an exciting time. This portfolio provides a flexible and adaptable capacity to address our economic and environmental challenges and opportunities.

It is a time for action.

II Departmental Overview

Vision

NRCan provides leading-edge science, knowledge and expertise to position Canada as:
- a world leader in the sustainable development of its land, energy, forest, mineral and metal resources; and
- a producer of high-quality resource-related products, technologies, services and research.

Operating Principles

Respect, honesty, equity, fairness and integrity are the basis of our relationship with Canadian citizens, our clients and each other. NRCan's Operating Principles define the business standards, beliefs and values of our organization and state what we are striving to achieve. We value the commitment and dedication of the people who form our organization and believe that:

Strong Leadership is Essential

We value leadership that provides a vision of the future and creates an environment of trust and respect. By example and involvement, leadership demonstrates a clear sense of direction, fosters teamwork, is accountable, and motivates and supports our organization in reaching its objectives.

People are Our Principal Strength

We work in a challenging and healthy environment that enables us to achieve our work goals and reach our full potential. We have the tools and opportunities to acquire the skills and expertise to perform our jobs, are encouraged to be innovative, and are recognized for our achievements.

Effective Planning Helps Us to Improve

We believe that planning for improvement is key to our ability to manage effectively and to measure the performance and impact of our activities. Through continuous learning and improvement, measurement and evaluation, we deliver efficient and relevant programs that support government priorities and objectives and meet the needs of our clients and stakeholders.

Creativity and Innovation are Key to Our Future

We value and support creativity and innovation in the development of leading-edge science and technology, policies and programs, better internal practices and improved service delivery. Creative thinking and innovative solutions can help us meet the challenges we face.

The Canadian Public Interest is Paramount

We help our Minister, under Law and the Constitution, to serve the public good and enhance the economic, social and environmental well-being of Canada.

Quality Service to Clients is Our Standard

We incorporate a strong focus in all our activities by consulting with our clients and stakeholders to ensure that we understand their needs and expectations and that our programs are relevant and useful. In delivering the best value for funds entrusted to us, we strive to seek excellence in our products and services.

Effective Communication is a Shared Responsibility

We create an environment and provide the means for open, honest and transparent communication that encourages the sharing of timely information throughout our organization and with clients and stakeholders. Collectively and individually, we demonstrate our value and contribution to Canadian society.

Cooperation is the Foundation of Our Success

We believe cooperation to be the foundation for meeting the challenges of the future. Through partnerships, teamwork and strategic alliances, we work together toward common goals both within and outside the organization.

NRCan's Business / Business Lines

Our job is to bring our strengths in policy and science to bear on the sustainable development of Canada's natural resources. We are committed to good governance, to the delivery of high-quality products and services, to partnerships with other private and public sector organizations, and to protecting the health and safety of Canadians.

The federal government is responsible for such matters as international trade and investment, science and technology, Aboriginal affairs, federal lands, national statistics and environmental issues. NRCan carries out these responsibilities in the area of natural resources. It also has statutory responsibility for regulating all legal survey work on federal lands, including territories affected by Aboriginal land claims.

Our operations involve four main business lines:

- science and technology;
- knowledge infrastructure;
- developing federal policy and regulations; and,
- promoting Canada's international interests.

In addition, the department has three special-purpose business lines. These are:

- corporate management and administration;
- Geomatics Canada Revolving Fund; and,
- sunset/special programs.

Science and Technology

Science and technology (S&T) are essential if Canada's resource-based industries are to compete in a world market that is increasingly competitive and sensitive to environmental issues. NRCan participates actively in both scientific and technological research and disseminates information, transferring its own and others' knowledge to the private sector. Discoveries and new technologies will help Canadians create new products and services. Our goal is to contribute to the wise and efficient use of our resources, cut costs and protect the environment.

Some achievements:

- NRCan developed integrated pest-management strategies for forestry, including the biological control of insect pests and competing vegetation;
- Our Mine Environment Neutral Drainage (MEND) Program has brought a number of stakeholders together to develop technologies to control acidic drainage from mines. These and other methods for mine operation and decommissioning will provide significant environmental and economic benefits;
- Working with the Canadian Space Agency, we develop and transfer technology for the acquisition, manipulation and storage of remote-sensed data, such as the information collected by Canada's RADARSAT program;
- Working with nine other departments and agencies, NRCan implements the federal Program of Energy Research and Development (PERD), which supports the development of science and technology to enable Canada to produce and utilize its energy resources in an environmentally responsible and cost-effective fashion. Many of the energy related S&T accomplishments mentioned in Section 3 of this report used PERD funds; and,
- NRCan developed an Intergovernmental Geoscience Accord for signature by federal, provincial and territorial ministers at the 1996 Mines Ministers Conference. The outcome will be an improved collaboration in the geosciences across Canada.

Knowledge Infrastructure

In partnership with provincial governments, universities and the private sector, NRCan continues to build a national knowledge infrastructure for Canada – a rich database of technical, scientific and economic information that the public can access. To make informed decisions, Canadians need data on our land, the networks that connect us, and the resources available for our use. This infrastructure is just as important as the physical infrastructure of road, rail and air carriers. Knowledge is key to any nation's economic progress. Our goal is to build a natural resource knowledge infrastructure in Canada to improve our prospects for economic and social growth in the global knowledge-based economy.

Our initiatives include the following:

- The Exploration Technology Program (EXTECH) develops new ideas and technologies to extend Canada's base metal reserves;

- The National Geoscience Mapping Program (NATMAP) is a multi-disciplinary and multi agency program to improve our geological database, both for resource industries and for environmental concerns;
- The National Atlas Information Services (NAIS) provides on-line access to information about Canada's landmass,
- The National Forestry Database compiles national forestry statistics, with the cooperation of provincial and territorial forestry agencies; and,
- The National Energy Use Database collects and analyzes national data on: energy efficiency at the end-use level; characteristics of buildings and energy-using equipment; attitude and behaviour of Canadian consumers toward energy use; and adoption of energy-efficient technologies.

Developing Federal Policy and Regulations

Our work in policy and regulations depends on close cooperation with all stakeholders and with other government departments with related mandates. The aim of our work is to increase the contribution of natural resource industries to Canada's economy while protecting the environment and the health and safety of Canadians.

Some examples:

- NRCan develops natural resource policies and strategic frameworks such as the new federal Minerals and Metals Policy, the National Forest Strategy, a framework for the management of radioactive waste and the Science and Technology Management Framework;
- We are working closely with Environment Canada to revise the *Canadian Environmental Protection Act (CEPA)* and with the Canadian Environmental Assessment Agency on further developments of the *Canadian Environmental Assessment Act (CEAA);*
- We advise the Department of Indian Affairs and Northern Development on northern resource and Aboriginal matters, including land claims issues;
- We are a major contributor to the federal science and technology strategy led by Industry Canada; and,
- We advise the Department of Finance, Revenue Canada and the Department of Justice on resource-related tax policy and administration issues, such as the review of the Northwest Territories mining royalty regime.

Promoting Canada's International Interests

NRCan promotes Canada's international interests through participation in international agencies. Our goal is to meet Canada's international commitments and to give our products, technologies and services access to the global market. Our participation is vital, since this market is becoming steadily more competitive and because environmental issues increasingly influence natural resource policies and access to markets.

Some examples:

- NRCan helped to shape the terms and implementation of the Framework Convention on Climate Change and the Global Convention on Biodiversity;
- We are a major contributor to international work toward a global forest agreement;
- We are actively engaged in waste and recycling issues, both domestically and internationally – for example, in relation to the Basel Convention;
- We have been instrumental in establishing and defending Canada's position on the United Nations Convention on the Law of the Sea; and,
- We have supported the Canadian geomatics industry in securing major international projects, resulting in contracts in excess of $20 million in exports in 1996-97.

Corporate Management and Administration

This business line represents the corporate management that administers the department's internal functions. It provides: coordination and managerial direction; administration of environmental activities; communications; Cabinet and Parliamentary liaison; financial, human resources, administrative, internal audit and program evaluation services; and information management/information technology and other support services to departmental operations.

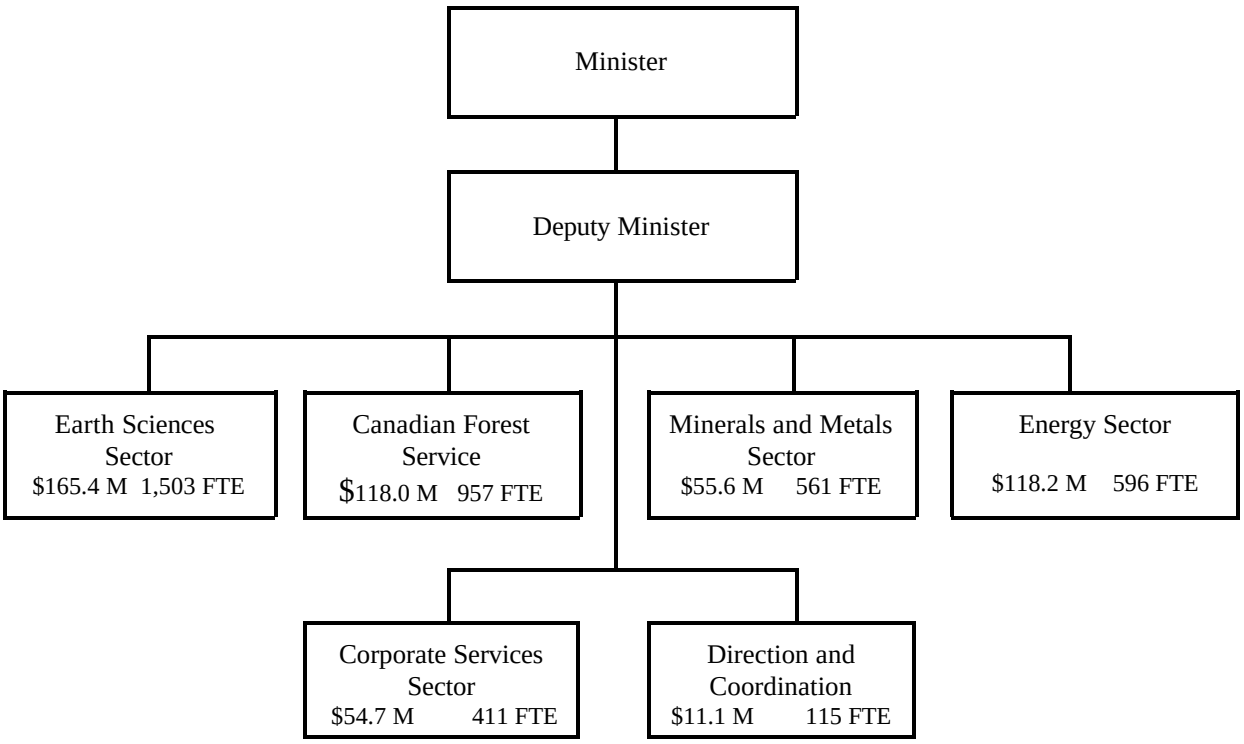
Geomatics Canada Revolving Fund

The fund was established under Appropriation Act No 3 in 1993-94 for the purpose of carrying out the revenue generating activities of Geomatics Canada. The revenue generating activities can be broken down into three elements: products (including maps and digital products), services and consulting. Geomatics Canada provides a wide range of clients a growing range of products and services suitable for industry distribution. It also provides value-added services and help to strengthen the geomatics industry on the international market.

Sunset/Special Programs

This business line groups support programs such as megaprojects, mineral development agreements and forest research and development agreements, all of which are being phased out as a result of government decisions, as well as boundary surveys for comprehensive land claims that have a definite end date.

NRCan 1996-97 Organization and Resource Relationships



- The **Earth Sciences Sector** (ESS) provides the geoscience and geomatics knowledge base and infrastructure to support public policy decisions. It also offers NRCan's clients logistics support for polar science as well as the information, expertise and technologies they need to exploit domestic and foreign markets.

- The **Canadian Forest Service** (CFS) promotes the sustainable development of Canada's forests and the competitiveness of the Canadian forest sector, for the well-being of present and future generations of Canadians. It delivers its S&T program through ten national science research networks operating out of five regional research centres and headquarters.

- The **Minerals and Metals Sector** (MMS) promotes the sustainable development of Canada's minerals and metals resources industry by integrating economic, social and environmental objectives. It provides policy advice, S&T and commodity and statistical information to support decision making. It is also the federal government's primary source of expertise on explosives regulations and technology.

- The **Energy Sector** (ES) promotes the sustainable development and safe and efficient use of Canada's energy resources through its policies, programs and S&T. It balances the potential economic, regional, international and environmental implications of Canada's energy production and use. It also provides technical knowledge and advice to the energy industry and to government. Its knowledge base helps the Canadian government formulate policies, implement regulations, enhance job and wealth creation and meet its international commitments.

- The **Corporate Services Sector** (CSS) provides central financial, administrative, information management and human resource services. In addition, under Direction and Coordination, there are the Executive Offices as well as a Strategic Planning and Coordination Branch, Legal Services, Communications Branch, and an Audit and Evaluation Branch, which contribute to improved performance measurement and accountability and an increased understanding of NRCan's mandate and programs among Canadians, clients and employees.

III Departmental Performance

A. Summary of Key Accomplishments

Natural Resources Canada with a budget of $522,970,000 in 1996-97	
provided Canadians with:	**as demonstrated by:**
Science and Technology: **Scientific research and transfer of new technologies to contribute to the wise and efficient use of our resources, reduce costs and protect the environment.**	• Pilot plant tests to prove the feasibility of recovering cyanide, which is used to extract gold from ore. This novel cyanide recovery process, developed by NRCan, will result in decreased cyanide costs and, as a bonus, increased copper recovery. • Tests of a hydraulic rock drill in a 5,000 metre test drilling at the experimental mine at Val D'Or. The conversion to hydraulic power could enable mining operations to reduce their total energy consumption by more than 30 percent, reduce equipment operating costs and increase productivity. • A design developed for a forest health monitoring system. • Carbon budget assessments completed in collaboration with B.C. Minister of Forests and the Foothills Model Forest. • The evaluation of the Canadian Model Forest Program. • Implementation of a photovoltaic-wind-diesel hybrid system in Inuvik, N.W.T., to help reduce Northerners' reliance on fossil fuels. • Successful field testing of the NRCan hydro cyclone to treat fluids extracted from oil sands and heavy oil sites in Alberta and Saskatchewan. • Commissioning of a vertical fired combustor that will facilitate development of technologies to control greenhouse gas emissions. • Creation of a new task within the Program of Energy Research and Development focusing on climate science, greenhouse gas disposal and impacts of climate change on the energy sector. • Launching a new federal/provincial/territorial partnership to build the geographic portion of the information highway allowing easy user access across Canada through the Canadian Geospatial Data Infrastructure. • Federal/provincial collaboration in geoscience. • Remote sensing applications developed for a number of land resources uses (Saguenay Floods, agriculture, forestry, environment, hydrology, etc.) • Developed an exploration model for identifying groundwater reservoirs. • Completed surveys on Sable Island bank to measure sediment transport and determine sea floor stability. • Geological and geochemical models extended for expanded exploration in the offshore western Newfoundland.

provided Canadians with:	as demonstrated by:
Knowledge Infrastructure: **A national knowledge infrastructure on Canada's land and resources – a rich database of technical, scientific and economic information that the public can use to make informed decisions, supported by NRCan's expertise.**	• Completion of Canada's criteria and indicators framework to measure its progress in the sustainable development of forests. • Completion of two studies evaluating traditional economic methods used in assessing Aboriginal forest issues. • The National Forest Database program which delivered on commitments. • Development and dissemination of information on energy efficiency and R&D trends in Canada, efficiency and alternative energy programs, and energy use in homes, private vehicles and industry. • Development and population of a database of projects funded by the Program of Energy Research and Development and ongoing assessment of project impacts. • $l2.l million in land survey contracts managed in support of land claim settlements and the Canadian Lands Survey System. • A Five-year landmark agreement signed to provide survey services for Treaty Land Entitlement, the Northern Flood Agreement and Specific Claims implementation in Manitoba. • Gas hydrates studied on the Vancouver Island continental slope. • A $5 million, Five-year agreement signed with NavCan for the production of aeronautical charts and related products.
Policy and Regulations: **Sound national policies and regulations for areas under federal responsibility to increase the contribution of natural resources to Canada's economy while protecting the environment, and the health and safety of Canadians.**	• Approval of the Minerals and Metals Policy of the Government of Canada: partnerships for sustainable development. • On-going support with other government departments, such as Environment Canada, in redefining wastes. • Draft Memoranda of Understanding for B.C., Newfoundland, N.W.T., N.B. and Saskatchewan regarding the collection, sharing and dissemination of mineral statistics. • Development of the final Evaluation Framework to assess success in moving toward good sustainable forest management nationwide. • Establishment of the Biodiversity Network and its supporting Business Plan. • Release of the Renewable Energy Strategy, focusing on improving investment conditions and developing a green power initiative.

provided Canadians with:	as demonstrated by:
Policy and Regulations: (continued)	• Increased participation in the Climate Change Voluntary Challenge and Registry Program to 600 participants up from 475 in 1995. • Implementation of more than 100 projects in federal facilities across Canada under the Federal Buildings Initiative, and private sector commitments to invest $120 million under the program that would yield an estimated $17 million in annual savings. • Regional geochemical and geological data completed and transferred to DIAND for the proposed park on Bathurst Island (Region 38 - Arctic Islands).
International Representation: **The promotion of Canada's interests pertaining to natural resources and international commitments.**	• Distribution worldwide of the Report "Canada's Mining Industry: A Global Perspective." • Seminars in Hong Kong, London, Geneva, Paris, Miami, Porto (Portugal), Washington, D.C. and Manzanillo on mining investment opportunities in Canada. • Seminars over the past five years which helped attract four major foreign investments in Canada with initial capital expenditures of over $235.5 million. As a result of 1996-97 investment promotion seminars in Europe, participating companies from Quebec raised more than $15 million. • Established, in conjunction with DFAIT, a new five-year Canada / United States Softwood Lumber Agreement. • The results from the evaluation of the International Forestry Partnership Program (IFPP). • Establishment of the Canadian Joint Implementation Initiative and signing of statements of intent to cooperate on actions implemented jointly with the United States and Mexico, China, Latvia and Korea. • Completion of a provisioning system with the departments of Foreign Affairs and International Trade, and Finance for financing CANDU exports. • Six geomatics and geoscience proposals developed with industry for contract work in Argentina, Lebanon (2), Russia, Mexico (2), Guinea, India and Malaysia. • Four geomatics technical missions with industry participation to China and Vietnam, to Korea and India, to Russia and to Mexico, Argentina, Chile and Peru. • Establishment of the Canadian Arctic-Antarctic Exchange Program, including the approval of two research science programs for logistics support in l997-98. • Commencement of a 3-year, $3 million CIDA-funded project addressing environmental practices and concerns in the mining sector of Guyana.

B. Performance Accomplishments

1. Policy Goals versus Business Lines

The table below shows the Policy Goals and Business Lines used in internal and external department planning and reporting documents (Business Plan, Performance Report, Report on Plans and Priorities and the Department's Planning Reporting and Accountability Structure [PRAS] document). Each business line relates to one or more of the policy goals.

Policy Goals	Business Lines
1. To integrate economic, environmental and social factors into Canadians' decisions regarding natural resources. 2. To expand the potential for economic growth and job creation based on the sustainable development of Canada's natural resources. 3. To encourage efficient resource development and use and to minimize the environmental impacts of resource development. 4. To work with Canadians to achieve our international climate change commitments. 5. To maintain and expand access to foreign markets for resource-based products and technologies. 6. To deliver federal responsibilities in partnership with provincial and territorial governments and stakeholders. 7. To help Aboriginal communities manage their natural resources. 8. To protect the health and safety of Canadians. 9. To provide information on Canadian land and resources needed for informed decision making.	**Science and Technology** 1. To conduct scientific research in support of land use and resource development and to promote Canadian economic development through the exploitation of the resulting technology **Knowledge Infrastructure** 2. To build, maintain and disseminate information from a national knowledge infrastructure in support of the management and sustainable development of Canada's landmass, offshore regions and natural resources. **Developing Federal Policy and Regulations** 3. To ensure that federal policy and regulations enhance the contribution of natural resources to Canada's economy while protecting the environment, the stability of rural communities and the health and safety of Canadians. **Promoting Canada's International Interests** 4. To promote global policies and agreements in areas of trade, environment and social policy, which advance Canadian objectives relative to natural resource stewardship, products, technologies and services. **Corporate Management and Administration** 5. To assist the executive and business line managers of the department in setting priorities, planning and achieving goals and in effectively administrating the public resources entrusted to them. **Geomatics Canada Revolving Fund** 6. To assist the revenue-generating operations of Geomatics Canada through the provision of an $8 million non-lapsing authority. **Sunset/Special Programs** 7. To deliver sunset programs such as offshore development funds, mineral development agreements, forest research and development agreements that are being phased out; and to deliver special programs such as boundary surveys for comprehensive Native Land Claim settlements and other special programs that have a definite end date.

2. Accomplishments by Policy Goal and Business Line

Policy Goal 1
To integrate economic, environmental and social factors into Canadian decisions regarding natural resources

Description

Sustainable development involves making better choices – finding ways to integrate economic, environmental and social dimensions into decisions about resource development. The federal government, through its regulatory responsibilities and environmental and economic policies, can have a significant impact upon resource development.

NRCan works with other departments to ensure that federal policies, programs and regulations, including those of NRCan itself, integrate economic, social and environmental values and support sustainable development. NRCan also develops the information and technology to give Canadians user-friendly access to the latest scientific, economic and social information, integrating data from a variety of sources.

Strategy

NRCan's strategy to achieve this goal is to:

- build an understanding of sustainable development principles and approaches;
- seek consensus on goals and action plans in specific areas;
- develop policy frameworks to support sustainable development;
- measure progress toward the sustainable development of natural resources; and,
- create an easily accessible knowledge base on economic, environmental and social factors to support decisions.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
In 1996-97 and later, proceed with the development of a Canadian Geospatial Data Infrastructure (CGDI), a national electronic network for geographic information, with the participation of database suppliers.	The Inter-Agency Committee on Geomatics, (IACG) took a lead role in guiding federal, provincial and territorial governments and the commercial sector to create the CGDI. Five working groups were established to exchange information on the five main thrusts: access, framework data, standards, partnerships and supportive policy environment.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Table in the House of Commons the sixth annual report on the *State of Canada's Forests (SOF)* to Parliament, featuring global forestry issues, in June 1996.	NRCan released and tabled the SOF in June 1996. (Estimated expenditures in 1996-97 were $250,000).
Undertake a full-scale commercial demonstration of Consolidated Tailings Technology, a dry landscape reclamation option.	NRCan worked in partnership with Suncor on Consolidated Tailings Technology. As a result, Suncor undertook a full-scale commercial trial at its site in Fort McMurray, Alberta, which led to the inclusion of the technology in their new $345 million Steepbank Mine proposal. NRCan developed the water chemistry model to predict the long-term implications of water recycle chemistry on extraction efficiency ($100,000 in-kind from NRCan; $100,000 from Suncor).
Complete the hydro geology of the Oak Ridges Moraine serving Greater Toronto.	Working with provincial partners, developed a successful new exploration model for identifying major untapped groundwater reservoirs. Three new potential municipal groundwater supplies have been identified and several maps, papers and a field guide have been completed. The newly developed technology (e.g., reflection seismic surveys, detailed sediment mapping) has been transferred to the private sector.
Business Line: Knowledge Infrastructure	
Socio-economic Research:	
Develop new approaches and knowledge to improve decision making about forest resources in Canada. Evaluate traditional economic methods in assessing aboriginal forest issues.	NRCan carried out a study near La Ronge, Saskatchewan, in cooperation with the University of Alberta, using traditional non-market valuation methods in an Aboriginal cultural context. A second study in north-western Saskatchewan investigated incorporating subsistence forest used in traditional economic base modeling. As well, a valuation study of aboriginal pictographs in a recreational setting was completed in Manitoba. (NRCan $50,000).
Measure benefits of non-timber values by developing state-of-the-art models and survey research.	A study of Manitoba forest ecosystems examined for both their recreational value and the role of fire. With the University of Alberta, NRCan refined pre-existing preference methods, which were applied to the valuation of an endangered species (woodland caribou), (NRCan $60,000).

1996-97 Commitments	1996-97 Accomplishments
Business Line: Knowledge Infrastructure	
Survey public attitudes and expectations in the management of Canada's forests.	Case studies conducted in Hinton, Alberta, and Pine Falls, Manitoba provided local assessments of forest-dependent communities' attitudes, health and well-being. Another study examined potential methods and scales to assess attitudes to forests and forest management ($55,000).
Draft a criteria and indicators (C&I) implementation plan on sustainable forest management for review by the Canadian Council of Forest Ministers (CCFM).	The completed draft was reviewed by the national CCFM Task Force on Criteria and Indicators for Sustainable Forest Management on June 11, 1997. The revised plan will be released for CCFM's review in early fall, 1997.
Release an initial report on groundwater resources in the vicinity of Portneuf, Quebec.	Substantial progress was made. The geophysical surveys design has been completed and an open file map of the area is in progress.
Provide logistics support to Arctic programs, including a variety of geological mapping and mineral assessment projects; and support to a wide variety of research by federal, provincial and territorial agencies and universities, for work on determining environmental impacts of economic development of northern renewable and non-renewable resources.	Logistics support was coordinated and provided to 166 Arctic field programs, including a variety of federal and territorial government and university geological mapping and mineral assessment research programs. Logistics support extended to a wide range of environmental assessment programs, including programs to determine the effects of ozone depletion and to determine the sources and extent of contamination of the Arctic food chain. Forty-six percent ($2.6 million) of the total cost of logistics services provided to client groups.
Business Line: Developing Federal Policy and Regulations	
Complete a Sustainable Development Strategy for Energy as an element of an NRCan sustainable development strategy.	The draft of the strategy was completed. It also contributed to the departmental sustainable development consultation paper.
Continue the ongoing analysis of potential fiscal impediments to sustainable development, e.g., the Level Playing Field Study.	The Level Playing Field Study was published in September 1996. The 1996 and 1997 federal budgets identified improved tax treatment. The 1997 Budget announcement, which included $60 million over three years to provide incentives for energy efficiency and renewable energy projects, will help address these fiscal impediments.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Make submissions to public hearings for environmental and regulatory approvals of three new Saskatchewan uranium mining proposals.	NRCan made submissions to public hearings. It received approval of the government response to the Panel recommendations on the McArthur River uranium mine, allowing the project to proceed.
Complete a new federal mineral and metal policy that meets the goal of sustainable development.	On November 19, 1996, the Minerals and Metals Policy of the Government of Canada: Partnerships for Sustainable Development was approved.
Provide support to Environment Canada in redefining wastes.	Active support was provided to Environment Canada's ongoing exercise for the Canadian Council of Ministers of the Environment — it is scheduled for completion in the fall of 1997.
Build an understanding of sustainable development principles and approaches.	NRCan promoted sustainable development as a key element in policy planning and advice through the government-wide Canada 2005 initiative and the new mandate policy development process.

Policy Goal 2

To expand the potential for economic growth and job creation, based on the sustainable development of Canada's natural resources

Description

Natural resource industries employ almost 750,000 Canadians and indirectly support jobs for more than one million other workers. A substantial proportion of resource employment is in highly skilled high-wage jobs.

Canadian resource firms are part of highly competitive global industries. Their success depends on their ability to market their products and services and to attract investment funds. Globalization will increase competitive pressures on both investment and market access into the next century.

The economic benefits from mining, forestry and energy are of particular importance to rural Canada. Natural resources are the backbone of rural economic development in Canada, with more than 500 predominantly rural communities largely or solely dependent on mining, forestry and energy. A significant portion of NRCan's work contributes directly or indirectly to rural communities, attracting more investment in resource development and stabilizing communities that depend on natural resource industries.

Strategy

NRCan's strategy to achieve this goal is to:

- develop policy and regulatory frameworks that support industry competitiveness and attract investment in natural resource industries;
- contribute to the development of an efficient fiscal regime for Canada's natural resources through work with the Department of Finance;
- enhance economic development opportunities for rural Canada;
- use S&T to increase productivity in resource industries and to develop new products and processes;
- support the development of "green" technologies; and,
- provide the knowledge and information necessary to encourage resource development.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Enhance the opportunity for small Canadian modeling companies to penetrate the Chinese market by training Chinese researchers in the use of a Canadian combustion model and associated laboratory kinetic measurement requirements.	NRCan trained two Chinese researchers from Xian Thermo Power Research Institute in characterizing coal types and running a combustion model to design, troubleshoot and improve the operation and performance of coal-fired power plants.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Establish a new manufacturing infrastructure among Small Medium Enterprises (SMEs) in secondary processing of advanced materials.	Four SMEs have established capability in the secondary processing of advanced materials through NRCan's interaction and effort.
Assess the energy resources from gas hydrates beneath Canada's continental margin.	With the University of Victoria, NRCan studied gas hydrates on the Vancouver Island continental slope. Funding from the Japanese industrial consortium has been renewed.
Continue modeling of processes in the development of continental margins that are fundamental to mineralization and to development of hydrocarbons.	Models of Atlantic-type continental margin evolution were refined to include mineralization processes.
Complete geoscience surveys of the coastal zone for key economic development sites in Atlantic Canada and for the Strait of Georgia south of Nanaimo, B.C.	Coastal surveys were completed: 1) over Phalen mine site (offshore Cape Breton), to determine environmental impact at the seabed and assist in planning future mine development; 2) off western Newfoundland, as part of cooperative research with industry to determine the petroleum potential of the region; and 3) in the Strait of Georgia, to assess transport and deposition of metals from the lower Fraser Delta.
Continue to supply new exploration and production data for new oil and gas initiatives in offshore Atlantic Canada.	Completed surveys on Sable Island bank to measure sediment transport and determine stability of sea floor, to be used for engineering design and hazard mitigation of gas fields on the Scotian shelf. It also developed hydrocarbon fluid flow models to test hydrocarbon accumulation in sedimentary basins. Consolidated and extended geological and geochemical models as a basis for expanded exploration success in the offshore western Newfoundland.
On average, 10 to 15 geoscience technologies annually are expected to be mature for transfer. Geoscience technologies that are ready for transfer, starting in 1996-97, include the Position Monitoring Technology, which facilitates sea floor mapping from ships; a Geographical Information System for describing and helping to quantify coal resources, and PETRIMES, a computer-based system for hydrocarbon resource modelling.	Preparation for the release of the coal modeling software is slightly behind schedule. An agreement has been reached with the United States Geological Survey on collaboration in coal geoscience. Six PETRIMES software packages sold (total sales $30,000).

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Continue the management of geomatics technology transfer projects, such as the Agricultural Productivity Monitoring project in Poland and the Land Reform project in Russia, using Canadian industry as executing agents.	An Agricultural Productivity Monitoring project in Poland is in the development phase with satellite imagery being received and processed in Warsaw using Canadian technology. A Land Reform project is also under way in Russia using Canadian digital mapping technology. Investment to date exceeds $2 million.
Continue the Geographic Information System (GIS) Development program through cost-sharing partnerships designed to strengthen the competitiveness of the Canadian geomatics industry by supporting GIS applications development and transfer of technology.	The Geomatics Development Program (GDP), formerly known as the Geographic Information Systems Development Program, contributed $l98,000 to eleven cost-sharing projects with industry contributing an equal amount, and CEONET funding permitted eight additional projects, for the development of geomatics applications and related technologies in the private sector, including one with the Atimkamekw First Nation to develop a forestry database for their communities. The GDP helps strengthen and support the competitiveness of the Canadian geomatics industry and assists in the transfer of technology and data to client agencies resulting in the creation of jobs and the advancement of knowledge.
Implement several development and pilot projects to support industry in the distribution and use of RADARSAT data for a wide range of applications (ice, ocean, hydrology, agriculture, forestry, mapping, geology and environment).	NRCan has transferred technology to several companies to enhance the distribution capabilities for RADARSAT, including a near real-time data link for sea-ice information to the Atlantic provinces. Information systems are now in place or under development for all application areas (ice, oceans, hydrology, agriculture, forestry, mapping, geology and environment). These applications include such global market opportunities as rice monitoring, tropical coastal management and African land cover mapping.
Continue the successful Industrial partners program of the Geological Survey of Canada (GSC) by making $1.5 million available annually for cost-shared projects of direct and immediate interest to clients.	GSC collaborated with industry partners on 68 projects under the auspices of the Industrial partners program. GSC contributed more than $1.4 million to support these projects while the industry partners contributed more than $1.3 million. Based on feedback from the industrial partners, these projects have resulted in the creation of new private sector jobs and improved access to government expertise and facilities.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
By 1998-99, obtain benefits in the form of reduced CO_2 emissions from lighter vehicles and increased employment, in Small Medium Enterprises (SMEs), including new companies attracted to Canada.	NRCan generated formability and characterization data which has resulted in reduced deleterious emissions because of the manufacture of lighter weight aluminum engine oil coolers.
Improve performance and environmental requirements and increase expertise in the area of materials for low-emission vehicles.	NRCan has substantially increased its expertise and contributed to the public knowledge base of materials for low-emission vehicles under the direction of its Advanced Materials Program. In general, materials have been studied for two applications: weight reductions leading to improved energy efficiency and materials for rechargeable batteries for electric vehicles.
By 1998-99, generate a $5 million per year impact in enhanced productivity benefits and commercialize improved oxidants technology in gold cyanization.	NRCan has proved, through pilot projects, the feasibility of using a new cyanide recovery process. The process should result in decreased cyanide recovery costs and in credits related to copper recovery.
Complete the Base Metals Initiative, with the publication of major reports aimed at stimulating the exploration needed to replace depleted ore reserves at the Sullivan Mine (B.C.), Kidd Creek (Timmins, Ont.) and Snow Lake Mines (Manitoba).	The report on a four-year multidisciplinary study of the Kidd Creek deposit indicates that it may be a unique occurrence. This information will be used to guide future exploration in the region. Results have attracted several industry partners, as well as the Ontario government, to help extend the studies. Publication of aeromagnetic/electromagnetic data (in both map and digital form) from airborne surveys over the Sullivan mining camp helped to revitalize exploration in this region of B.C. A publication that interprets the variation in electromagnetic conductivity of crustal rocks in the Snow Lake mining area has generated much interest from the private sector in the potential for technology transfer of this geophysical tool, as well as contributing to a better understanding of the structural geology in this area that will help target current and future exploration activities.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Release extensive airborne geophysical survey data in the Bathurst region (site of the Activity's EXTECH II Project). This is also expected to stimulate exploration. The EXTECH II Project at Bathurst will be completed in 1998.	The use of new data from an airborne geophysical survey conducted in New Brunswick's Bathurst mining camp has resulted in the discovery of a new massive sulphide occurrence. The survey, carried out as part of the EXTECH II Program, indicates that there may be other massive sulphide deposits in areas that have not been successfully explored in the past with traditional methods and techniques. The survey sparked a significant increase in claim staking and a revitalized interest in the Bathurst mining district.
Undertake field testing of the next generation hydrocyclone, used to treat fluids extracted from oil sands.	NRCan undertook field testing of its hydrocyclone at Wascana's Verlo site and Husky's Lloydminster site, both in Saskatchewan, and Suncor's Fort McMurray site in Alberta. Performance in all cases exceeded the oil/water separation cost efficiency of existing technologies, ($400,000 in total; $250,000 from industry partners).
Identify processes and operations where significant energy savings can be realized, such as near-net-shape casting and direct rolling, reheat furnace practices and the elimination of certain operations.	Fifteen years of work by NRCan on the use of fly-ash in high-performance concrete helped pave the way to Prince Edward Island. Fly ash is coal ash, a by-product of burning coal in power plants, which normally goes to a landfill. Fly ash comprised 15 to 30 percent of the 66 different mixtures of concrete used in the construction of the Confederation Bridge, opened in May 1997. Using supplementary cementing materials (SCMs) instead of regular cements reduces the annual CO_2 emissions generated by cement production by 1 to 2 million tonnes, and saves 0.8 petajoules of energy. The use of SCMs has already saved $5 million per year in waste disposal costs. NRCan and Barrick Gold began testing automated ventilation in an underground mine, where the location of diesel mining equipment and airborne pollutant concentrations will dictate the air's distribution, magnitude and duration. As the mine expands, this automation initiative, if successful, will eliminate a 50 percent increase in ventilation volume and associated natural gas heating costs and will avoid a 200 percent increase in electrical power demand.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Establish technology and coal characteristics needed to produce supercoke thereby allowing increased replacement of coke by injection of coal in blast furnaces.	NRCan studied the applicability of Canadian and foreign coals to the coke making practices required to make supercoke. Canadian medium-volatile high-inert coals have proven to be particularly suited for supercoke manufacture and would allow the use of higher levels of alternative fuels. Work continues to determine if several coals can be blended to produce supercoke. (For 1996-97, the value of this cost-shared program with the Canadian Carbonization Research Association was about $100,000.)
Complete testing of small turbine units being developed for the Canadian, Eastern European and Southeast Asia markets.	NRCan arranged for technology transfer from France of a 25-kw wind turbine and awarded a contract to Wenvor Technologies of Guelph to manufacture these machines in Canada. Tacke Windpower of Huron Park, Ontario will manufacture the blades. The cost is shared between: NRCan ($193,000); Wenvor ($150,000); and Tacke ($43,000).
Complete project demonstrations of an energy efficient pulsed fluid-bed dryer.	NRCan successfully demonstrated, on a laboratory scale, the jet-spouted bed with inert particles technology. This system dries secondary pulp and paper sludge, meat rendering sludge and municipal sludge. The dried sludge can then be marketed. If this technology proves commercially successful, it may eliminate more than 25 million tonnes per year of CO_2 equivalent emissions resulting from the incineration, composting and land filling of wet sludge.
Business Line: Knowledge Infrastructure	
Complete a synthesis survey of the geology and resource potential of the Beaufort-MacKenzie region.	Synthesized and published the current geoscientific knowledge about this important frontier as the *Geological Atlas of the Beaufort-MacKenzie Region*.
In 1996-97 and subsequent years, ensure that, to the maximum extent possible, there is a common usage of advanced technology (e.g., for Geographic Information Systems) for airborne surveys, and for access to and manipulation of digital data (including direct electronic access by clients).	The Geophysical Data Centre web site allows clients to determine data availability by geographic region (GIS). Registered clients can download data to be charged to their account. The use of Fieldlog, a digital mapping technology, has greatly reduced the time required to release geological

1996-97 Commitments	1996-97 Accomplishments
Business Line: Knowledge Infrastructure	
(continued)	maps following field observations. Fieldlog version 3, developed and upgraded by the GSC, can be retrieved by clients from the Geoscience Integration Section web site. In a pilot project to evaluate future digital map distribution, the GSC web site provided the new *Surficial Materials of Canada* map in three GIS formats. The site served more than 300 clients in the first six months.
Business Line: Developing Federal Policy and Regulations	
Complete the federal response to the National Task Force on Oil Sands Strategy.	NRCan, with Finance Canada, finalized legislative provisions to define which oil sands qualify for accelerated capital cost allowance.
Continue to work toward an energy chapter for the Agreement on Internal Trade. The first priority is an agreement on parameters to be used for electricity transmission access and to make recommendations to Energy Ministers.	Federal and provincial energy ministers reached agreement on the approach to concluding transmission access provisions in the energy chapter of the Agreement on Internal Trade.
Negotiate final settlements on outstanding Canadian Exploration Incentives Program (CEIP) and Petroleum Incentive Program (PIP) cases in a cost-effective and equitable manner.	Resolution of outstanding incentive program claims (CEIP and PIP) has proceeded well during the year. The rationale for rejection of one PIP claim (in excess of $1 million) was communicated to the applicant in June 1996 and has not been challenged. A second claim was settled by the courts in favour of the Crown, while a third applicant has refunded NRCan the amount owing. There is one major claim still in dispute where the applicant is suing the government for in excess of $13 million.
Provide support to the Georges Bank review panel, and establish the environmental review panels with Environment Canada for the Terra Nova and Sable Offshore Energy Program projects.	The Georges Bank Review Secretariat was established and assists the Panel in planning, scheduling and implementing meetings with interested stakeholders. Joint Review Panels were established for the Terra Nova and Sable Offshore Energy Projects.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Identify process improvements for pre-production permitting regulations and land-use decision-making processes and work with responsible departments to implement those improvements.	NRCan coordinated the Government's response to two reports of the House Standing Committee on Natural Resources on streamlining environmental regulations for mining. The responses, tabled in June 1996 and March 1997, presented more than 50 initiatives to improve environmental and land-use decision-making processes. As examples, in 1996, NRCan, Parks Canada and DIAND, in conjunction with the governments of the Northwest Territories and Yukon, published terms of reference for Mineral and Energy Resources Assessments (MERAs), which are undertaken as part of the establishment process for new national parks. Regional geochemical and geological data completed and incorporated in a DIAND publication on MERA process for Region 38 (Arctic Islands) proposed a park on Bathurst Island. MERA reports were published for the Northern Torngat and Bonavista/Funk proposed National Marine Conservation Areas.
Assist the Department of Indian Affairs and Northern Development (DIAND) and the Department of Finance in developing an internationally competitive fiscal regime for mining generally, and diamond projects in particular, in the Northwest Territories.	NRCan provided DIAND with information, comments and a critical review of the discussion paper "Proposed Amendments to the Mining Royalty Regime in the Canada Mining Regulations." Our input was particularly related to competitiveness and such technical issues as the definition of eligible exploration expenses, the computation of the process allowance, etc. DIAND accepted our suggestions and agreed to implement them.
Conduct an assessment of the impact of petroleum fiscal systems on the attractiveness of investments in Canada relative to foreign countries.	This issue is now being dealt with in co-operation with Finance Canada in the context of the broader review of the corporate tax system conducted by the Technical Committee on Business Taxation.
Complete mineral resource certifications required by the mining industry to obtain benefits under the Federal Income and the *Excise Tax Act*, and provide advice to Revenue Canada on the technical interpretation of the mining-related portions of Acts, to ensure predictable and consistent rulings.	NRCan completed Mineral Resource Certificates for silica, feldspar, allanite, apatite, barite and talc deposits. A press release was issued announcing a change to the *Income Tax Act* to confer mineral resource status on ammonite-gemstone deposits.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Promoting Canada's International Interests	
Hold investment seminars in major foreign financial-mining centres, and represent federal interests at international mining events (e.g., the Investing in the Americas conference) and in mining-related missions, thereby providing accurate information to potential investors on the evolving regulatory and economic framework for investing in Canadian mining and on Canada's promising deposits and geological potential, and facilitate company contacts.	NRCan held seminars in Hong Kong, London, Geneva, Paris, Miami, Porto (Portugal), Washington, D.C. and Manzanillo. Seminars over the past five years have helped attract four major foreign investments in Canada with initial capital expenditures of over $235.5 million. As a result of 1996-97 investment promotion seminars in Europe, participating companies from Quebec raised more than $15 million.
Complete a report on Canada's ability to support continued mineral production at current levels.	A report submitted at the 1997 Mines Ministers' Conference and a paper proposed for the fall 1997 issue of *Mineral Industry Review*, indicated a significant increase in Canadian mineral output when the Voisey's Bay deposit and the N.W.T. diamond deposits reach production.
Provide support to the geomatics industry in export market development resulting in business opportunities.	NRCan worked with industry to develop six geomatics and geoscience proposals for contract work in Argentina, Lebanon (2), Russia, Mexico (2), Guinea, India and Malaysia. Geomatics export sales in 1996 were estimated to be $550 million. NRCan worked closely with companies in gaining more than $20 million in exports. The contracts were in Russia, China, Saudi Arabia and India. NRCan also organized four geomatics technical missions, with industry participation, to China and Vietnam, to Korea and India, to Russia and to Mexico, Argentina, Chile and Peru.
Complete a report on Canada's international competitiveness in mineral production.	NRCan completed a report entitled "Canada's Mining Industry: A Global Perspective" and distributed it to key individuals worldwide.
Provide annual reports on the levels of Canadian ore reserves.	NRCan analyzed and reported on Canadian Reserves of selected major metals.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Promoting Canada's International Interests	
Complete technical analysis and other support essential to updating the international mineral investment community on the relative competitiveness of Canada's fiscal regime for mining and mineral exploration.	NRCan provided analysis and data, particularly on the international aspects of Canadian income taxation. This information was included in seminars held in Hong Kong, London, Geneva and Paris. The analysis was also an essential component of a widely distributed publication: "Lessons from Canadian Mining Taxation, an International Context".

Policy Goal 3

To encourage efficient resource development and use, and minimize the environmental impacts

Description

Sustainable development can be advanced through policies, programs and technologies. These should encourage efficient resource extraction, processing and use; support reuse and recycling; and develop environmentally sound alternatives. We need to develop and promote new processes, practices, materials, products and energy sources that generate fewer pollutants and waste products and present fewer risks to human health and the environment.

These measures not only reduce environmental risks and conserve resources, but also have real economic benefits, by reducing costs and creating new business opportunities in the marketing of "green" technologies, services and products, and contributing to the creation of new jobs.

Strategy

NRCan's strategy to achieve this goal is to develop and implement policies, programs and regulations and develop technologies that:

- increase efficient use and recycling of resources;
- minimize the impacts of resource development and use on the environment; and,
- develop and promote renewable energy sources.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Provide project management assistance in the development of a district heating feasibility study and implementation plan and in contractor selection for Windsor, Ontario. The system would enhance the integration of energy production and usage.	NRCan provided full project management services, resulting in a $26 million contract being let to design, build and operate the heating and cooling plant. Windsor is providing the distribution piping. All capacity for this first phase has been sold out. This project was initially cost-shared between Windsor ($100,000) and NRCan ($100,000), with NRCan receiving full reimbursement after the project was initiated.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Implement the Canadian Arctic-Antarctic Exchange Program in partnership with the Canadian Antarctic Research Program.	The Canadian Arctic-Antarctic Exchange Program was established and two programs involving Canadian research scientists and their Antarctic colleagues were approved for logistics support in l997-98. The Program encourages joint bi-polar research programs; helps Canada to consolidate its international scientific reputation and commitments; and, encourages scientific partnerships.
In 1997-98, establish a field demonstration plant for thiosalts removal**.** (Thiosalts, formed during the milling of sulphide ores, can have a positive or a negative impact on metal recovery. If released into the environment, they can undergo oxidation to produce sulphuric acid leading to potential acidification of the receiving stream.)	NRCan held a workshop with industry in June 1996 to define issues and prepare an action plan for further work. A six-member consortium for Phase II was subsequently formed and work was initiated to better understand, measure and control thiosalts.
By 1998-99, complete reports on appropriate cost-effective methods of determining the biological and non-biological impact of mine effluent on Canada's lakes, rivers and streams**.**	NRCan completed an acute toxicity report (April 1996); a pilot field study report (September 1996 using 1995 data), and preliminary survey reports for seven more sites (January 1997).
By 1998-99, attain benefits of $60 million per year from increased efficiency, improved production practices and reduced wastage, as well as a reduction of CO_2 emissions related to energy savings.	The Mobile Foundry Laboratory completed 18 visits, resulting in recommendations for increased foundry productivity and competitiveness. CANMET conducted tests of one version of a hydraulic rock drill in a 5,000 metre test drilling test at the experimental mine at Val d'Or. The conversion to hydraulic power could enable mining operations to reduce their total energy consumption by more than 30 percent, reduce equipment operating costs and increase productivity.
Forest Ecosystem Processes:	
Determine how forest ecosystems function, and how they are impacted by nature and humans.	Baseline research on nutrition and carbon cycling in forest ecosystems has been established in the Pacific, Maritime, Boreal and Acadian eco-regions of Canada.
In partnership with universities, industry and provincial ministries, initiate national research programs in forest nutrient and carbon	NRCan conducted succession studies for Douglas Fir-Hemlock, Boreal mixed wood, Black Spruce-Jack Pine and Balsam Fir ecosystems across Canada, to

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
(continued) dynamics, productivity, succession, ecophysiology, and insect, fungal and microbial ecology.	document the impacts of natural and forest management disturbances and to develop succession models. NRCan is developing a forest science strategic direction on "Sustainable Site Productivity in Canadian Forests" using the knowledge acquired from a national workshop held in Sault Ste. Marie (February 1997). The proceedings are being published in the Canadian Journal of Soil Science. NRCan is developing a national strategic direction on "Ecophysiology of Forest Productivity" based on knowledge acquired from a national workshop held in Quebec City in March 1997. The proceedings were published and posted on the Internet. A research program was developed to study the ecological role of insects and pathogens in forest renewal and decline, with emphasis on significant insect pests of Canada. The Extended Concentration to Link Forest Ecophysiology and Productivity (ECOLEAP) research project has been established to improve our understanding of the mechanisms that control forest ecosystem productivity. ECOLEAP will develop tools (e.g., GIS and remote sensing) for use in temporal monitoring of forest productivity at the landscape level. (Approximately $6.2 million was spent by NRCan for its work in forest ecosystem research. Industrial and provincial partners contributed about $500,000, and in-kind support of forest experimental sites represented approximately $1 million.)
Identify a national network of representative experimental forests across Canadian forest regions which are affected by common ecological factors.	NRCan has selected sites in collaboration with the Effects of Forestry Practices Network, ($50,000).

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Forest Practices:	
Develop and assess new approaches to harvesting and regeneration practices that will provide alternatives that are more ecologically sound and cost efficient.	A number of alternatives to clearcutting at mid-to-high elevation sites in British Columbia forests were analyzed. The results were transferred to provincial, industrial and public clients through field tours, media and scientific and technical reports.
Provide analysis of alternative silvicultural systems for use in mid-to-high altitude elevation forests.	
Establish and document a national set of forestry practices experimental sites in forest ecotypes across Canada.	The Forest Ecosystem Research Network of Sites (FERNS) was initiated to provide long-term forest management research and a link between individual multi-stakeholder and multi agency sites across Canada. Currently, there are ten national sites.
Advanced Genetics and Tree Biotechnology:	
Increase the productivity of forests through biotechnology and advanced tree genetics.	NRCan established a research program to increase understanding and develop advanced technologies in genetics and tree breeding.
Increase growth and productivity through genetic tree improvement in a cost effective and environmentally safe manner.	A tree breeding strategy for White spruce was published and transferred to the Province of Quebec. Transfer of the breeding program and material was initiated and will be completed in 1998-99.
Increase the resistance of forests against pests through genetic improvement.	NRCan started a research program to improve trees through conventional genetics and tree biotechnology. Researchers have introduced genes with antifungal and insecticidal effects into trees to test the genes' ability to control diseases.
Identify how to conserve the genetic traits of tree species.	A research program has been established to increase our understanding of the genetic diversity of Canada's forest tree species and to develop recommendations for the preservation of this resource.
Characterize the gene involved in development and flowering, and demonstrate its function in genetically altered plants.	NRCan isolated and registered a series of genes potentially involved in controlling flowering in Black spruce. Work is in progress to test their efficacy and effects.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Study the architecture of genetic markers in White spruce.	Researchers found DNA markers for wood quality and response to somatic embryo genesis in White and Black spruce. Work is in progress to test whether these markers can have universal application over the range of genotypes in the respective species. (NRCan spent approximately $3.1 million in associated salary and O&M for its work in advanced genetics and tree biotechnology. An additional $500,000 was spent from Canada's National Biotechnology Strategy).
Pest Management Strategies and Methods:	
Develop alternatives to chemical pesticides for reducing damage and losses from forest pests and competing vegetation.	The parasitoid *Ceranthia samarensis* was successfully released in Ontario against targeted gypsy moth populations.
Evaluate the potential of biological controls (parasites and nematodes) for forest insect pests (e.g., Gypsy Moth).	Researchers made significant progress in assessing parasitoids for use against insect pests such as White pine weevil, Birch leafminer, Pine false webworm, Yellow-headed spruce sawfly, Spruce budworm and cone and seed insect pests, (NRCan spent approximately $350,000 with an equivalent amount in direct or in-kind support from collaborating agencies).
Assess the risks and benefits of alternative pest control products in forest ecosystems.	NRCan made substantial progress in developing protocols for assessing risks of recombinant virus products for insect control. This work confirmed the effectiveness and environmental acceptability of Mimic insecticide (a growth regulator) the acceptability of Neem insecticide, (NRCan spent approximately $200,000 in O&M in addition to external support).
Develop technologies for the commercial production and evaluation of naturally occurring and engineered bacteria, viruses and fungi for pest control.	NRCan has developed recombinant viruses for spruce budworm. Commercial partners are assisting with patenting and further assessment. As well, molecular sampling kits were developed for efficient identification of forest disease organisms. Fungal pathogens have been developed (e.g., *C. purpureum*) and commercial partners found for development of vegetation control products. Researchers have made significant progress in identifying antifungal microbials to help reduce forest

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
(continued)	disease incidence. Progress was made in the production and testing of naturally occurring viruses for insect control, including T_3NPV, (approximately $600,000 was spent by NRCan and the equivalent or greater amounts were provided in external funding, as well as National Biotechnology and Green Plan (final year) funds).
Isolate and evaluate natural compounds with potential for pest control (e.g., pheromones for pine shoot borer management).	NRCan made considerable progress in confirming that Neem is an effective natural insecticide for a variety of forest insect pests. Researchers identified other natural products from native and exotic plants and began bioassays to determine their potential for insect control. Pheromones for monitoring and control were identified and/or investigated against a number of pests, including the pine shoot borer, through international collaboration between NRCan, industry and Chilean forest companies. (NRCan spent approximately $200,000 on this work. Outside partners contributed an equivalent amount.)
Foster the use of renewable energy technologies in remote Canadian communities.	The renewable energy for remote communities program has been set up and two initiatives were launched. One involves the development of a comprehensive pre-feasibility software tool for the evaluation of renewable energy systems in remote communities. The other promotes efficient biomass heating systems for commercial buildings, thereby increasing the self-reliance of remote communities.
Business Line: Developing Federal Policy and Regulations	
Assist in completing the interdepartmental Strategic Options Process (SOP) to manage the use of toxic substances used in the Base Metal Smelting and metal finishing industries.	As a member of the Base Metal Smelter SOP and Metal Finishing SOP (BMSSOP). NRCan has provided detailed constructive comments to enhance the accuracy and balance of the draft reports, since the beginning of the process. Documents will be finalized by fall 1997.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
A balanced regulatory approach that protects the public and the natural environment.	NRCan has worked with Environment Canada over the past three years to develop both the *Canadian Environmental Protection Act* (CEPA) and the *Canadian Endangered Species Protection Act* (CESPA) Bills.
Implement the Renewable Energy Strategy by holding a round table on renewable energy information, training and education, and expanding the Federal Buildings Initiative to include renewable energy.	In October 1996, the Renewable Energy Strategy was released and was well received by the renewable energy industry and other interested stakeholders. Most of the policy work done under the Strategy during 1996-97 focused on either improving investment conditions or developing a green power initiative. Both the 1996 and 1997 federal budgets announced measures to promote investments in renewable energy sources. As well, consultations were held in the fall of 1996 on options to improve the treatment of investments providing heating and cooling from renewable sources. A letter of intent was signed with Ontario Hydro in the fall of 1996 and a Request For Proposals was issued for green power in Alberta in February 1997.
Provide substantive input to the development of federal environmental regulations affecting metals and minerals and control of emissions and effluents.	Over the past year, NRCan has been involved with the development of numerous federal environmental regulations including the *Mackenzie Valley Resource Management Act,* the *Yukon Quartz Mining Act,* the *Yukon Placer Mining Act,* the *Nunavut Water Act,* and the Mine Reclamation Policy of the Northwest Territories (DIAND); *Canada's Oceans Act* Department of Fisheries and Oceans (DFO); and it has helped draft bills seeking amendments to the existing *Fisheries Act* (DFO).

Policy Goal 4

To work with Canadians to achieve our international climate change commitments

Description

Climate change is an important issue for NRCan. An estimated 87 percent of Canada's greenhouse gases are energy related. Forests play a crucial role in climate stability, removing carbon dioxide from the air and storing it in vegetation and soils.

Canada, along with 150 other nations, is a signatory to the international Framework Convention on Climate Change. The convention commits Canada and other developed nations to work toward the stabilization of their emissions of greenhouse gases (such as carbon dioxide) at 1990 levels by the year 2000. Current estimates indicate that Canada's emissions levels will be approximately 13 percent above 1990 levels by the year 2000.

Canada must actively work with other nations to develop coordinated international responses to global climate change issues. International negotiations are under way to amend the convention to include possible further commitments for beyond the year 2000.

Within Canada, action on climate change requires the cooperation of federal, provincial and local governments, as well as industry, environmental group and the general public. Canada's response is coordinated through the federal, provincial and territorial ministers of energy and environment. Working in partnership, Canada has developed the National Action Program on Climate Change that will help reduce emissions of greenhouse gases.

Strategy

Working in partnership with Environment Canada, NRCan's strategy to achieve this goal is to:

- monitor progress towards objectives;
- encourage action by individuals and companies;
- conduct research to increase the understanding of climate change and its potential impacts and to develop cost-effective mitigation options;
- develop technologies to reduce greenhouse gas emissions; and,
- build international consensus for cooperation and action.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Evaluate a zero emission transit bus powered by Canadian fuel cell technology and using Canadian lightweight composite cylinders to store the hydrogen fuel.	Evaluations of the bus have been completed and two small fleets have been established, one in Vancouver and the other in Chicago. This project is cost-shared with B.C., Ballard and NRCan.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Commission a vertical fired combustor that will allow development of combustion technologies employing oxygen and recycled CO_2, and assess and remove emissions of priority substances, e.g., mercury.	The combustor has been successfully commissioned and NRCan is now entering into partnerships with federal, provincial and industrial partners to address greenhouse gas emission control technologies. (The three-year cost – 1994-97 – of building this facility was $2.2 million).
Complete the creation of new Program of Energy Research and Development (PERD) activities on energy and climate change, and raise the visibility of information in the opportunities for greenhouse gas mitigation technologies and services.	A new task within the PERD has been formed, with major components on climate science, greenhouse gas disposal and impacts of climate change on the energy sector. The task is closely aligned with international climate science activities and with the government's energy priority framework.
As part of the C-2000 Advanced Buildings Program: complete the detailed design for an office building in Kamloops; initiate the construction phase for an office building in Richmond, B.C. and a multi-residential building in Edmonton; and initiate the monitoring of an office building in Waterloo and a multi-residential building in Montreal.	The IDEAS Challenge, a joint CMHC/NRCan initiative, resulted in detailed designs for five multi-residential buildings. One building has been constructed in Montreal and is being monitored. Others have not been built due to poor market conditions. Two C-2000 office buildings were constructed in Richmond and in Waterloo and are now undergoing monitoring. A detailed design has been completed for the Kamloops office building.
Work with companies in Alberta and Nova Scotia, the Alberta Government and other stakeholders to develop a radio frequency low pressure drier for agricultural and wood products.	Development work is proceeding in Alberta on processing wood and hay and optimizing operating parameters. The first solid-state radio frequency amplifier has been delivered from Nova Scotia. A full-scale commercial system should be in operation by the end of 1998. (At year-end 1996, $2.9 million had been spent on this project with NRCan's share at $631,000. The total project cost is estimated to be $9.3 million with NRCan support in the order of $3.1 million.)
Develop a large diameter hoop-wrapped natural gas vehicle (NGV) cylinder for sale to the heavy-duty bus and truck market as well as the light-duty NGV market.	Development is complete and the cylinder is in the certification process. The cylinders will be used for the trucks that are part of the Clean Cities project. (The cost of this project was $500,000).
In partnership with British Columbia Research Institute (BCRI), original equipment manufacturers (OEMs) and small and medium enterprises (SMEs) develop and demonstrate a low-emissions propane fueled heavy-duty truck.	The engine is now in the truck. NRCan could not continue funding this project but BCRI and the ICG company will continue on with the demonstration portion. (The cost of this project to NRCan was $150,000.)

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
In cooperation with OEM truck and engine manufacturers, demonstrate two medium duty natural gas powered trucks, with commercial production of the trucks to follow.	This project has been rolled into the Clean Cities project. The OEM medium-duty natural gas truck and engine components will be commercially available in 1998-99.
Conduct an assessment of the environmental consequences of a two degree warming of western and northern Canada.	A major report, with multiple collaborators, is near completion with submission for final publication in l997. Outputs from this research will be used to test General Circulation Models and to assess impacts of future changes (e.g., climate warming).
Conduct an assessment of the impacts of a sea level rise in eastern Canada.	Developed a GIS-based Coastal Information System with trials conducted in Nova Scotia and Newfoundland. Completed a detailed aerial video survey, along the Bras d'Or Lakes shoreline in Cape Breton to be used for mapping the geology of the area and the sensitivity of the shoreline to possible effects linked to global change.
Climate Change: *Identify the role Canadian forests play in storing carbon and reducing atmospheric CO_2 and to assess how Canadian forests may be impacted by future changes in the climate.* Continue to develop the Carbon Budget Model to better delineate the changing contribution of Canadian forests and their management to the global carbon cycle.	The results of Canada's Carbon Budget Model have been published and presented to the international forest community for peer review. They were cited in the *Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report*. The Forska and Century models were developed to delineate forest ecosystem dynamics. NRCan assembled data for land-use change and land-use types for managed and unmanaged forests and completed studies of actual climate variability. NRCan completed carbon budget assessments in collaboration with the B.C. Ministry of Forests and the Foothills Model Forest, ($205,000).
Continue analysis of the Boreal Ecosystem Atmosphere Study (BOREAS), and conduct additional field studies to fill information gaps identified from the 1993 and 1994 campaigns.	BOREAS and BFTCS sites collected and analyzed biometry data on boreal forest canopy, soils and vegetation decomposition. This information was made available worldwide through the BOREAS Information System, and three supporting reports have been published. NRCan scientists served as principle investigators in the ongoing BOREAS experiment, and participated on the BOREAS Operations Group, ($185,000).

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Continue the Boreal Forest Transect Case Study (BFTCS) to determine and assess the sensitivity of various ecosystem processes to changing climate.	BFTCS generated nine manuscripts that were submitted to the international community for peer review. To date, seven have been approved for publication. The results of BFTCS studies have been presented at a number of national and international symposiums and workshops and have been formally accepted as one of the cornerstone transects of the International Geosphere-Biosphere Program, ($125,000).
Business Line: Knowledge Infrastructure	
Undertake four energy-use surveys and prepare a report on Energy Efficiency Trends in Canada.	NRCan sponsored a survey to collect information about homes built in 1994. We continued to sponsor the National Private Vehicle Use Survey to collect monthly data on private vehicle fuel consumption, kilometres driven, and vehicle and household characteristics. The department sponsored an expansion of Statistics Canada's 1996 Industrial Consumers of Energy Survey to improve coverage of large energy-using sectors. NRCan published *Energy Efficiency Trends in Canada*. The report analyzes the contribution of energy efficiency to changes in energy use and greenhouse gas emissions. It is the first such publication ever produced in Canada.
Business Line: Developing Federal Policy and Regulations	
Work with provincial energy and environment departments to establish an independent Climate Change Voluntary Challenge (CCVC) and Registry Program	At the Joint Energy and Environment Ministers' Meeting in December 1996, it was agreed to establish an independent Voluntary Challenge and Registry office in 1997.
Assist custodian departments to develop long-term energy management and action plans for the Federal Buildings Initiative (FBI), to achieve commitments made by their ministers.	More than 100 FBI projects are now at various stages of implementation in federal facilities across Canada. By mid-1996, the private sector had committed to invest $120 million under the FBI that would yield an estimated $17 million in annual savings. One FBI project at Canadian Forces Base Halifax, will employ a variety of energy-saving measures costing in excess of $10 million, generating annual savings of $1.5 million.
Increase the number of individual corporate commitments participating in the CCVC.	Corporate participants in CCVC have increased to 600, up from 475 in 1995.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Participate in a federal/provincial/stakeholder review of Canada's progress under the National Action Program on Climate Change.	NRCan completed a formal review of the National Action Plan on Climate Change. At the Joint Energy and Environment Ministers' Meeting in December 1996, it was agreed to strengthen efforts towards the stabilization of greenhouse gas emissions.
Provide Home Energy Retrofit training and certification to all registered R-2000 home builders and extend this training to other builders, in collaboration with trade associations and provinces.	NRCan began testing software, field procedure administration and program material through pilot projects in Montreal, Whitehorse and London. These systems should be fully operational in late fall 1997.
Negotiate action plans with all government departments with fleets to rationalize their fleet size, reduce their energy consumption and increase their use of alternative fuels.	NRCan developed and distributed planning tools (the FleetWise planner and Qtool software package) to all federal fleet managers. It also gave seminars to assist them in managing their fleets more efficiently, cut costs, save energy, and promote the use of alternative fuels. An alternative fuel demonstration project involving 150 federal vehicles was initiated.
Establish minimum energy performance levels under the *Energy Efficiency Act* for incandescent reflector lamps and approximately 15 other products.	Regulations for incandescent reflector lamps took effect in 1996. NRCan conducted extensive consultations on electric motors regulations, scheduled for implementation in October 1997, and started internal drafting of proposed regulations for 14 additional products, scheduled for implementation in 1998.
Negotiate commitments from Canadian institutions and commercial and industrial companies to develop and implement energy management plans under the Energy Innovators and Industry Energy initiatives.	The Energy Innovators Initiative recruited 46 new energy innovators from the commercial and institutional sectors. Upon joining, these institutions made a commitment to undertake significant action to become energy efficient in their building operations and have registered with the Voluntary Challenge and Registry. The number of Industrial Energy Innovators increased by 26 in 1996-97, to a total of 238. The number of action plans increased by 154 over the fiscal year, bringing the total to 172. Energy efficiency commitments covered 75 percent of industrial energy use.
Implement an Auto$mart driver training program on fuel efficiency, with driver training schools, and implement the new Fleet Energy Program to promote energy efficiency	The Auto$mart Student Driving Kit, with video, instruction materials and CD-ROM, was completed and tested with driver trainers and students across Canada. The kit was introduced in March to driver

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
(continued) in fleet operations through Memoranda of Understanding with national associations.	trainers in Saskatchewan high schools. The new fleet energy program, FleetSmart, was announced on March 24, 1997. Five industry associations agreed to promote energy efficiency in Canadian vehicle fleets and to help NRCan deliver the program. The first FleetSmart workshop was held in B.C.
Assist fuel suppliers and vehicle components producers to establish markets for alternative fuels through multi-party marketing programs and infrastructure development programs.	In British Columbia, NRCan provided $330,000 to B.C. Gas for marketing factory- built natural gas (NG) vehicles and for the construction of five NG stations. NRCan also provided $150,000 to the B.C. Natural Gas Alliance for the construction of three NG public refueling stations on Vancouver Island. In other provinces, grants of $1 million were provided for the conversion of 2,000 vehicles to NG. Grants of $2 million were also given for the construction of several public and private NG refueling stations. Assistance was provided for several innovative demonstrations in NG vehicles. NRCan carried out a program for developing the use of propane and complementary infrastructure in eastern Canada, ($445,800).
Business Line: Promoting Canada's International Interests	
As part of the National Action Program on Climate Change, establish the Canadian Joint Implementation Initiative (CJII).	NRCan established the CJII in 1996. Statements of Intent to Cooperate on Actions Implemented Jointly have been signed with U.S./Mexico, China, Latvia and Korea.

Policy Goal 5

To maintain and expand access to foreign markets for resource-based products, technologies and services

Description

Canada's natural resource industries are strongly oriented to international markets, therefore, market access is crucial. These industries have benefitted from the free trade that has been established with many of Canada's trading partners. Maintaining international agreements and trading rules will help to preserve this market access.

International consumers are demanding assurance that the products they buy do not compromise the quality of the environment. NRCan is working through international agencies, including international commodity organizations, to ensure that trade in natural resource products is not unnecessarily restricted on the basis of environmental considerations. NRCan's expertise helps assess the scientific basis of proposed trade restrictions or develops alternative processes acceptable to our trading partners. NRCan is also working with industry, provinces and territories to demonstrate that the development and management of our natural resources are based on the principles of sustainable development.

Strategy

NRCan's strategy to achieve this goal is to:

- support rules-based trading;
- produce the expertise and information necessary to ensure that rules of trade are based on sound science;
- develop internationally accepted standards and criteria for sustainably developed products and services; and,
- promote the export of Canadian natural resource related products, services and technologies through the Canadian International Business Strategy and in cooperation with industry.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Renew the Memorandum of Understanding (MOU) on Energy R&D with the U.S. Department of Energy (DOE).	NRCan undertook negotiations with DOE toward renewal of the MOU, to be signed in August 1997.
Develop information tools that support a better understanding of the sustainability of construction materials and current pulp and paper industrial practices.	NRCan provided funding toward the development of special material to assess the environmental impact of various gypsum wallboard and finishing materials over their life cycle, ($25,000).

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Establish a Clean Cities Corridor, in partnership with the U.S. DOE, original equipment manufacturers (bus and engine), small and medium enterprises, the natural gas industry, Environment Canada and trucking firms, to demonstrate the use of natural gas in intercity tractor-trailer trucks operating from Mississauga, Ontario through Buffalo, New York to Oriskany, New York.	Partnerships were established with all participants who have committed to substantially reduce vehicle emissions, increase the use of natural gas and improve fuel efficiencies. Significant progress was achieved toward improved vehicle operation and economics, automated border crossings and "weigh in motion" (the Interstate 75 project).
Collaborate with other Departments, e.g., the Canadian International Development Agency (CIDA), to assist the Canadian environmental industry to penetrate the South American market.	Collaborated with several South American agencies; examples are: the Brazil Project for Sustainable Development in the minerals sector (technical training, conference, ISO 9001 accreditation, seminar); and the Argentina Project for Technology Transfer in the minerals sector (technical/managerial training, baseline study training, Argentinean visit to demonstrate Canadian technique and experience). NRCan has been approved by CIDA as the implementation agency for a $3 million project in Guyana which will address a range of environmental concerns related to mining activity. NOTE: All projects involve sub-contracts to Canadian private companies.
Business Line: Knowledge Infrastructure	
Explore means of harmonizing the different international certification proposal options.	Review, at the international level, approaches to sustainable forest management which remains a focus of the International Tropical Timber Organization (ITTO). Harmonization is an ongoing issue that was considered by the IPF, not directly by Canada, in 1996 and 1997.
Conduct an assessment of voluntary sustainable forest management certification in developing countries and report findings to the United Nations Commission on Sustainable Development (UNCSD).	Canada participated in the Intergovernmental Panel of Forests (IPF) and a number of international certification meetings. The task of summarization, assessment and reporting to UNCSD has been assumed by the international community including Canada.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Participate with the Department of Foreign Affairs and International Trade (DFAIT) in consultations with the United States, as required, to protect access of the Canadian uranium industry to the U.S. market, as provided under NAFTA.	U.S. legislation, passed in 1996, ensures the Canadian uranium industry's access to the U.S. market, as provided under NAFTA. NRCan continues to monitor the situation to ensure that legislated quotas are respected.
Improve access to transmission services for electricity producers, by developing a Canadian strategy concerning U.S. reciprocal access to transmission services.	NRCan, with the Department of Foreign Affairs and International Trade, developed an approach to U.S. reciprocal transmission requirements and NAFTA obligations and briefed U.S. regulatory commissioners on the Canadian transmission access position. Two Canadian utilities have received approval of their applications to the U.S. regulator, one has been denied, and one is pending.
In September 1996, at the invitation of Disney Corporation, host the Third International Symposium on Fireworks at Disney World, Lake Buena Vista, Florida.	With an attendance of 238 members from some 19 countries, this is now the best attended international event on the subject of pyrotechnics. This event showed solid international recognition of NRCan's role in regulating, testing and researching pyrotechnics, and provided increased international opportunities for Canadian companies.
Provide support to the Canadian Standards Association's (CSA) Technical Committee tasked with establishing voluntary sustainable forest management standards.	NRCan gave ongoing support to the CSA Technical Committee throughout development of standards Z-808 and Z-809 which were approved by the Standards Council of Canada in October 1996, ($125,000).
Business Line: Promoting Canada's International Interests	
Work with Foreign Affairs and International Trade and Finance on developing a provisioning system for financing CANDU exports.	The Canada Account Provisioning System went into effect on April 1, 1996.
Assist Environment Canada in completing a scoping paper and an issues document needed as terms of reference for negotiations regarding water quality and ecosystem objectives for the Columbia River Basin.	Environment Canada has postponed this activity.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Promoting Canada's International Interests	
For a three year period beginning in 1995-96, and in partnership with the CIDA and the Brazilian Geological Survey, undertake a project aimed at promoting the sustainable development of Brazil's mineral resources, with emphasis on transferring sound environmental practices.	The Geological Survey of Canada (GSC) and the Geological Survey of Brazil focused efforts on the collection of basic ecological and geological information in socially and environmentally stressed areas, such as the Tapajòs region of the Amazon Basin. Changing mining practices from the environmentally hazardous artisanal methods, to controllable and sustainable hardrock mining will have immediate social effects. GSC provided training in the use of ground penetrating radar and gamma ray spectrometry to the Brazilians for exploration and to monitor hazardous disposal sites. New business opportunities have been created for Canadian companies related to these technologies.
Assist Transport Canada in having coal and non-ferrous concentrates removed from the coverage of the Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances (HNS), under negotiation with the International Maritime Organization (IMO).	At IMO's legal committee meeting on the proposed Convention on HNS, (April 1996), Canada, in collaboration with Japan, Italy and other countries, was able to convince delegations not to include coal, non-ferrous sulphides (e.g., copper concentrates) and direct reduced iron in its HNS list.
Participate in the development of action plans for the implementation of sound management principles (for chemicals) in NAFTA countries.	NRCan has provided policy and scientific inputs into developing a regional action plan for mercury and a document outlining criteria for selecting additional candidate substitutes for regional action plans.
Complete a review of materials for the Organization for Economic Co-operation and Development classification lists of wastes and non-wastes.	The majority of classification has been completed.
Support Environment Canada's development of workable and effective domestic regulations governing trade in hazardous recyclable metals.	NRCan participated actively in the December 1996 CCME waste re-definition workshop. The workshop led to the development of a proposed regulatory framework for hazardous recyclable metals that would be risk based and largely consistent with the Government's Minerals and Metals Policy.
Lead and participate in Canadian delegations to meetings of international mineral and metal organizations on lead, zinc, nickel, copper, sulphur, potash iron ore, fertilizers, coal and waste materials.	Three study groups continue to meet twice yearly and produce comprehensive statistical information and analysis of the metal market. This promotes market transparency and assists industry in planning investments.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Promoting Canada's International Interests	
Implement measures to minimize the threat of transmitted disease, (in particular, pinewood nematode) to European Union (EU) forests from Canadian lumber.	NRCan developed a proposal for an Enhanced Visual Inspection Program for shipments of softwood lumber to Europe. The program is designed to address phytosanitary concerns raised by the European Community, ($40,000).
Provide policy and technical support to DFAIT in the management of the lumber trade dispute with the United States.	NRCan provided advice and technical support to DFAIT during the implementation and operation of the first year of the five year Canada/United States Softwood Lumber Agreement. The agreement was put into effect on April 1, 1996.
On average, on behalf of Canadian companies, bid on five or six major overseas geoscience and geomatics projects per year.	The World Bank awarded the GSC a $500,000 contract to supervise a major geoscience initiative in Guinea. A Canadian geophysical contractor won a $1.25 million contract for the acquisition of aeromagnetic and radiometric data as part of this initiative. GSC scientists assisted the Guineans in the design, evaluation and interpretation of these surveys. The GSC and a Canadian consulting firm were awarded a $1.25 million World Bank contract to assist the Argentine Federal Government Geoscience Agency (SEGMAR) to upgrade its capabilities in providing quality products to exploration companies in Argentina. About 50 Canadian companies are actively exploring in Argentina. A near shore survey for heavy minerals off the coast of Sri Lanka was carried out at the request of the United Nations Revolving Fund for Natural Resources Exploration. A Canadian seismic reflection system, *Seistec*, was utilized with Canadian industry to achieve its goals of mapping potential economic deposits and identifying sites for future core sampling and resource evaluation. In collaboration with CIDA and private industry, participated in an assessment of the geology and hydrocarbon potential of a region embracing eight east African countries.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Promoting Canada's International Interests	
Establish cooperative agreement(s) with international research organizations to develop harmonized test methods and wood product standards.	NRCan facilitated the establishment of a collaborative arrangement between Forintek Canada Corporation and the Building Research Institute of Japan to develop new test and analytical methods for studying the lateral resistance of timber structures against seismic loads.
Canada will present its positions at the third meeting of the panel in September, and at preparatory meetings on issues such as reforestation, certification, criteria and indicators, and national strategies.	NRCan led Canada's delegation to the third meeting of the Intergovernmental Panel on Forests (IPF) and succeeded in gaining wide stakeholder support for its international forest policy positions.
Continue with DFAIT and the CCFM, implementing of the International Forestry Partnership Program (IFPP) to provide balanced information on Canada's forests.	An evaluation of the IFPP was completed indicating that the Program has been successful in achieving its overall purpose of protecting Canada's forest products trade in Europe and promoting Canada's image as an environmentally responsible forest nation. The Program also created a network of people who are informed about Canadian forestry practices. The evaluation helped to support an expansion of the IFPP to include the United States and monitor developing issues in Japan. (Estimated Program expenditures in 1996-97 were $625,000).
NRCan will manage the process of developing and presenting Canadian positions to the IPF, which is to make recommendations on 11 global forest issues to the UN Commission on Sustainable Development (UNCSD) in 1997.	NRCan hosted national consultations in Ottawa prior to the third and fourth meetings of the IPF held in September 1996 and February 1997 to assist in the preparation of Canada's positions. The recommendations that the IPF put forward to the(UNCSD are consistent with Canada's goals. NRCan strongly advocated the need for an international forest convention during the high level segment of the UNCSD meeting in April 1997.
Contribute to internationally agreed upon measures of sustainable forest management through the Montreal process (12 countries with temperate and boreal forests).	Canada led the international development of the "Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests" and the "Santiago Declaration". Canada also continued to host the Liaison Office, which provides ongoing coordination and impetus.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Promoting Canada's International Interests	
Review with the 12 member countries, availability of data for reporting on international criteria and indicators.	Canada, in conjunction with the other Montreal Process Countries, produced: - a summary report on the status of data and ability to report on the Montreal Process Criteria and Indicators; - a *Progress Report* and a *First Approximation Report* in June 1996; and - a progress report on the implementation of the *Montreal Process on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests*. It was tabled at the fourth session of the IPF in February, 1997.

Policy Goal 6

To deliver federal responsibilities in partnership with provincial and territorial governments and stakeholders

Description

NRCan has a strong record as a partner in providing natural resource-related programs, economic and scientific information, and services to Canadians. With its provincial and territorial partners, NRCan has learned that cooperation between governments and with other stakeholders, is the best way of identifying and addressing natural resource issues and opportunities. NRCan is committed to working with its partners both to coordinate policy and planning in areas of shared interest and to identify issues for joint resolution.

Within this partnership, NRCan will provide leadership and coordination in addressing natural resource issues of a national or international nature.

Strategy

NRCan's strategy is to:

- establish frameworks for common action with its partners, including other federal government departments;
- develop cooperative mechanisms to address high-priority issues; and,
- take a "Team Canada" approach to national and international opportunities.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Complete the transfer of all CANMET upgrading staff to the National Centre of Upgrading Technology, a joint venture with Alberta for oil sands and heavy oil upgrading science and technology.	The staff transfer was completed on time, ($303,000).
Disseminate information about the opportunities international arrangements provide Canadian researchers using the Program of Energy R&D (PERD) network, publications and seminars, and other vehicles, e.g., the Internet.	The Office of Energy Research and Development's home page was established in 1996-97. The home page is the principal vehicle for disseminating information about energy R&D opportunities. As well, a description of areas for potential collaboration under the International Energy Agency's (IEA) Implementing Agreement on Multiphase Flow Sciences was distributed to Canadian researchers at the university, government and industry levels.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Disseminate information to address natural disasters.	Completed geological interpretations of multi-special scanner imagery along the Rivière aux Sables, Rivière Chicoutimi and Rivière du Moulin, which were used to assess the erosion and deposition that occurred in affected areas. Produced a CD-ROM containing satellite and airborne imagery and other information on the July 1996 floods and presented results from the remote sensing data on the Saguenay floods at the 1st Annual Forum on the Development of Geomatics in Quebec City.
Establish a new PERD management structure (i.e., Panel, PERD Committees for Component Areas) and draft new project selection and approval guidelines.	The roles and responsibilities of the Panel and PERD Committees are elaborated in the PERD MOU. The Panel's new role and responsibility is of an advisory nature to the Panel Chairperson (ADM/Energy). PERD Committees are primarily responsible for reviewing and commenting on projects submitted to PERD for funding. New project selection and approval guidelines have been drafted and are currently being reviewed by PERD participating departments.
Negotiate PERD funding agreements or MOUs with participating departments.	As of April 1, 1997, MOUs were signed between NRCan and the nine other participating departments (Agriculture and Agri-Food Canada, Canada Mortgage and Housing Corporation, Environment Canada, Fisheries and Oceans, Health Canada, National Defence, National Research Council, Public Works and Government Services Canada, and Transport Canada). The MOUs establish a framework for cooperation between NRCan and all departments participating in PERD to support cooperative energy research and development efforts in the fields of non-nuclear energy. Collaboration is to the mutual benefit of NRCan and the participating departments.
Undertake and publish a review of federal, provincial and industrial energy expenditures and cooperation.	A draft report analyzing trends in Canadian energy R&D expenditures by federal and provincial governments, industry and electric utilities for the 1983-1995 period has been completed. The report will be finalized in 1997-98.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Implement an Active Control system prototype to allow higher precision use of Global Positioning System (GPS) technology in real-time.	NRCan completed establishment of an eight– station network, Canada-wide for support of real-time commercial services. It also signed agreements relating to GPS and the Canadian Active Control System with seven provinces as of March 31, 1997, which are expected to promote long-term economic growth.
Complete an assessment of the first five years of the Model Forests Program and establish directions for the next phase.	NRCan completed an evaluation of the Canadian Model Forest Program in June 1996. The report indicated that the program had succeeded in establishing a strong foundation of broadly based partnership groups in a network of ten Model Forests. It recommended that the program be continued for a further five years. The report recommended using "on the ground" demonstrations of sustainable forest development. Phase II of the Program, announced in October 1996, provides $40 million for 1997-2002. Guidelines were developed to focus on demonstration of sustainable forest management, local level indicators, knowledge transfer and enhanced Aboriginal involvement. The Program was also expanded to include an additional Aboriginal led Model Forest. (Estimated costs for the Model Forests program for 1996-97 were $300,000.)
Review the benefits of Canada's participation in the International Energy Agency's (IEA) Collaborative Technology Agreements.	NRCan has undertaken a review of Canada's participation. For every dollar Canada has invested in IEA R&D agreements, an estimated $2.42 is returned to Canada in benefits. These include information sharing between IEA member countries, reduced duplication of work, pooling of financial and human resources, reduced R&D costs and risks, enhanced networking and contracts. The study includes a qualitative assessment of the agreements and a methodology to estimate the value to Canada of non-financial benefits.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Maintain support to the 10 Model Forests across Canada as testing grounds for new approaches in sustainable forestry.	NRCan served as secretariat. It coordinated national activities and communications such as semi-annual Network business meetings. It also coordinated a national conference showing the progress made during the first five years; produced a draft compendium of over 300 Model Forest projects; produced a bi-monthly newsletter; and maintained a national Model Forest Web site. Regional Centres provided coordination and support to individual Model Forests and supported Regional Communications, local technical workshops and technology transfer, (program expenditures were approximately $12 million in 1996-97).
Business Line: Knowledge Infrastructure	
Increase federal-provincial cooperation to improve data exchange and the inclusion of native names in the Canadian Geographic Names Database (CGNDB).	NRCan now has signed agreements with Prince Edward Island and Newfoundland on the exchange and dissemination of geographical names data, making a total of ll provincial and territorial agreements. Process improvements, made for uploading geographical names in the CGNDB, resulted in new provincial and territorial data being received periodically that included native geographical names. NRCan provided provincial digital data files to Nova Scotia and New Brunswick.
Implement new geographic information systems applications in partnership with other government agencies and the geomatics industry.	NRCan, through joint projects with other government departments, added application themes to the National Atlas identified by users, such as through SchoolNet. Under the CEONet project, four projects were initiated on the development of tools for access and use of government geospatial data and transfer to the private sector (at a cost of $446,000 for NRCan and $520,000 in partners' contributions).
Populate the new Program of Energy R&D (PERD) database and continue monitoring, evaluating and measuring the impacts attributable to PERD's investment.	The new PERD database now includes projects that were in place as of April 1, 1996. Collection of completed projects and assessment of their impacts is ongoing.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Knowledge Infrastructure	
Provide the necessary information on Canadian forest resources, resource management, resource products and forest related benefits for informed decision making.	NRCan managed the National Forest Database Program (NFDP) on behalf of the Canadian Council of Forest Ministers (CCFM). NRCan published the *Compendium of Canadian Forestry Statistics* and other statistical reports and contributed information to the annual *State of Canada's Forests* report and to Canada's first pilot report on criteria and indicators. The program also responded to formal requests for information from international agencies such as the FAO and the OECD and to requests from the Canadian public, (the estimated cost of managing the NFDP in 1996-97 was $562,000).
Business Line: Developing Federal Policy and Regulations	
Review the structures of Ministerial Advisory Committees (e.g., the National Advisory Council to CANMET and the Advisory Committee on Whitehorse Mining Initiative Implementation) to ensure efficient stakeholder input to the development of policy for minerals and metals.	This review was completed.
Continue to ensure, through the National Geological Surveys Committee, that national geoscience programs are harmonized with those of the provinces and territories.	The Geological Survey of Canada participated in biannual meetings of the National Geological Surveys Committee to discuss and ensure harmonization of Canada's government geoscience programs.
Continue to negotiate MOUs based on the Intergovernmental Geoscience Accord with remaining provincial and territorial geoscience survey organizations.	GSC signed a MOU with Manitoba to direct mutually relevant federal and provincial geoscience. Geoscience "needs" workshops were held with federal, provincial and industry representatives in New Brunswick and Manitoba to develop priorities, and coordinate plans for geoscience studies in each of these provinces that are being implemented in l997-98. Undertook geoscience studies under existing arrangements with most provincial/territorial governments.
Examine and commission candidates as Canada Lands Surveyors.	Board of Examiners of Canada Lands Surveyors conducted the Canada Lands Surveyors examinations and qualified 31 of 111 candidates for a commission as Canada Lands Surveyors.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Develop new and improved partnerships with industry, provinces and territories and other government departments in gathering and disseminating minerals and mining information.	The Minerals & Metals Sector home page provides access to mineral statistics, branch and departmental reports and links with many other mining and mineral related sites. SoftAccess, a package of software, databases and other information, provides selected data to external clients.
Work with provinces, the National Energy Board (NEB) and industry to improve natural gas regulatory efficiency, e.g., by exploring how intervenor funding could be integrated into NEB-related activities.	The Canadian Energy Pipeline Association (CEPA) submitted, to the NEB for approval, a package of voluntary enhancements to the Early Public Notification process, including a mediation approach to resolve pipeline/landowner issues. These voluntary measures are in response to NRCan's encouragement to the Canadian pipeline industry to resolve pipeline/landowner issues voluntarily.
Continue support to Tree Plan Canada to increase tree planting to help mitigate global warming.	NRCan supported Tree Plan Canada under the terms and conditions of the NRCan-Tree Plan Canada contribution agreement, (total cost of the program is $3.5 million over three years).
Prepare an action plan for the evaluation of the National Forest Strategy (NFS) by an independent panel.	NRCan completed the final evaluation framework, which was approved by the NFS Coalition, to guide the final evaluation of the NFS, and to assess Canada's success in moving toward the goal of sustainable forests nation wide. The evaluation, being conducted by an independent Blue Ribbon Panel, will assess Canada's effectiveness in meeting each of the 96 commitments made under the Strategy's nine strategic directions and the continued relevance of the commitments.
Review the structure of the federal-provincial Mines Minister's Conference and implement required changes.	Participants do not all agree that the conference should be changed from its present format. Mines Ministers have agreed to work collaboratively on National Mining Week and to support work on policy issues including regulatory efficiency and the harmonization of environmental processes.
Administer the federal mandate for the Cape Breton Development Corporation (CBDC).	NRCan expedited the consideration and subsequent approval by Treasury Board of CBDC's five year corporate plan.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Organize the Eighth Biennial Federal/Provincial Conference on industrial minerals.	The conference was organized and held in October 1996.
Achieve greater cost-effectiveness and efficiency in joint operations with the provinces through frequent contacts, including the yearly meeting of the Federal/Provincial Committee on Mineral Statistics.	Greater cost-effectiveness and efficiency in joint operations with the provinces and territories resulted from the October meeting of the Federal/Provincial Committee on Mineral Statistics and from various working committees, including the Small Working Group on Exploration Definition. One of the major achievements of this year is the new definition on exploration expenditures.
Complete the programming and socio-economic impact assessment under the Ontario Agreement on Mineral Development (MDA).	The assessment has been completed.
Enter into Memoranda of Understanding (MOUs) with provinces on statistical collection, data processing, data sharing and dissemination that ensure optimum data quality and operational efficiency.	NRCan has drafted MOUs with B.C., Newfoundland, N.W.T., New Brunswick and Saskatchewan on the collection, sharing and dissemination of mineral statistics. Final signing should take place in late 1997. A MOU with Ontario was renegotiated in early 1997.
Business Line: Sunset/Special Programs	
All Forestry Resource Development Agreements (FRDA) agreements will have been concluded or in final pay-out years. FRDAs will contribute an estimated $5.0 million toward R&D and technology transfer activities.	NRCan has completed the Canada/Quebec Auxiliary Agreement on forestry development and proceeded with the management and monitoring of projects accepted within the framework of the Canada/Quebec agreement on regional economic development in Quebec, (estimated expenditures were $3.3 million in 1996-97).
Complete the evaluation of the FRDA Indian Lands Forestry Program and determine the future of the Program.	The evaluation of the Indian Lands Forestry Program by Indian and Northern Affairs Canada (DIAND) was completed in January 1996. NRCan and DIAND created a new stand-alone program for three years, with a possible two year extension subject to the availability of government and other funding.

Policy Goal 7
To help Aboriginal communities manage their natural resources

Description

Aboriginal communities are increasingly involved in the management and development of their natural resources. NRCan is working in partnership with Aboriginal groups on issues related to resource development, and providing skills, expertise and training that Aboriginal peoples need to manage their lands and resources.

Strategy

NRCan's strategy to achieve this goal is to:

- work with other government departments to develop policy and governance frameworks dealing with Aboriginal involvement in the management of natural resources;
- provide Aboriginal communities with the skills and training they need to manage their lands and natural resources; and,
- transfer to Aboriginal communities technologies related to resource management that respond to their specific needs.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Implement a technology demonstration in Inuvik, N.W.T., as part of the Photovoltaics (PV) for the North program, in order to demonstrate the technical reliability and cost effectiveness of PV hybrid systems.	The Aurora Research Institute in Inuvik inaugurated its Photovoltaic/Wind/Diesel Hybrid System on September 15, 1996. This pilot project will be a training tool for renewable energy systems and will help Northerners reduce their reliance on fossil fuels.
Business Line: Knowledge Infrastructure	
Manage and regulate all surveys of Canada Lands, which constitute over 50 percent of Canada's landmass, plus offshore areas, and are populated by over 500,000 people, mostly natives.	NRCan managed survey programs and oversaw contracts to the private sector and monitored their quality. Actual expenditures in 1996-97 were $7.4 million for comprehensive land claims, $2.9 million for specific land claims and $1.8 million for other survey-related activities. In September 1996, NRCan signed a land-mark agreement, covering an initial five-year period, to provide professional and technical land survey related services for Treaty Land Entitlement, the Northern Flood Agreement, and Specific Claims implementation in Manitoba.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Knowledge Infrastructure	
(continued)	Completed and signed off three atlases compiling surveys over a ten-year period for the Inuvialuit Final Agreement. This completes NRCan's obligation under that Land Claim.
Business Line: Developing Federal Policy and Regulations	
Coordinate management and delivery of Canada's First Nation Forestry Program announced by Ministers Irwin and McLellan in April, 1996.	The new program received over 300 project proposals valued at approximately $51 million. Of these, 159 projects were approved based on the availability of federal program funds. These projects resulted in the estimated generation of 6,500 work weeks of aboriginal employment with the potential for additional temporary and permanent employment in the future. The program also generated an estimated $11 million of investment into First Nation communities. (In 1996-97, a budget of $5.9 million was allocated for economic development initiatives for First Nations. Of this amount, $5.0 million was transferred to NRCan from DIAND, $650,000 was funded under the Federal-Provincial Resources development Agreements; the remainder $250,000 was funded from NRCan's budget. As well, the program was successful at levering an additional $6.4 million into the program from First Nations and other sources.)

Policy Goal 8
To protect the health and safety of Canadians

Description

NRCan's programs and expertise involve a wide range of public health and safety issues. For example, our knowledge of Canada's landmass includes an understanding of such natural hazards as earthquake zones, unstable soils and possible volcanic activity.

These pose potential problems both for public health and safety and for sustainable development. While natural disasters cannot be prevented, we can do our best to predict them better, improving public safety. We also help minimize such public health concerns as dangerous mining conditions (for example, rockbursts) through our solid understanding of the geosciences.

The department's programs also address some aspects of health and safety that are not specifically or uniquely related to resource development. For example, NRCan administers the *Explosives Act*. It is a principal player in the international detection and reporting of nuclear weapons tests. In addition, the department's national aeronautical charting program is critical to the safety of navigation for both civil and military aviation.

Strategy

NRCan's strategy to achieve its goal in the area of health and safety is to:

- provide information on dynamic natural events such as earthquakes and landslides, and an understanding of the processes that cause them;
- contribute knowledge on the hazards of resource development, such as rockbursts in mines and melting permafrost around such northern installations as pipelines;
- administer the *Explosives Act*;
- play a principal international role in the detection and reporting of nuclear weapons tests;
- ensure the safety of navigation for both civil and military aviation through its national aeronautical charting program; and,
- provide information and a forecasting service on geomagnetic storms, which can have serious indirect health and safety effects by disrupting communications channels and navigation and by their effect on electrical power grids.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Attain more accurate prediction of the growth of corrosion cracks and its characteristics.	A 20-member international consortium project has led to greater understanding of the effects of pressure fluctuations, cathodic protection, soil pH and bacterial growth on stress corrosion crack growth rates. The project has identified factors that decrease crack growth rate.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Improve communication in noisy work areas by adding an anti-noise system to communication equipment already in miners' helmets**.**	Project supported by l'Institut de recherche en santé et en securité du travail (l'IRSST) du Québec Science Committee. Noise level equalizer circuit developed and tested, validation now underway, interim report completed.
Develop cost-effective technology for preparing paste backfill for controlling rockburst in mines**.**	A successful field trial of NRCan's paste backfill process at a client's mine proved the effectiveness of using surface tailings for ground control in deeper mines. The process allows a faster mining cycle, improves mine safety, allows increased production, reduces backfill costs and permits tailings to be disposed of underground. This process will save the company about $6 million in cement use and reduce their surface environmental liability. This in turn will allow the mine to continue to operate, (the mine was to shut down due to the previous liability).
Achieve a reduction in failure rate due to stress corrosion cracking, with direct savings to pipeline operators.	NRCan works with Canadian Standards to establish materials standards for the safe operation of Canada's Pipeline System. Engineering Critical Assessment (ECA) pipeline methodology and software developed to determine critical crack size and crack driving force. Report on propagation of stress corrosion cracks in pipelines, ($600,000 from government, $320,000 from industry, over the period 1993-97). Hydrotesting has been subjected to laboratory analysis, yielding important data on the effects of this test on linepipe cracking. This is the first data on the effects of hydrotesting, which is widely used to determine the fitness of linepipes for service.
By 1998-99, improve safety for miners when extracting ore bodies from weak rock masses or from very deep ore deposits**.**	NRCan completed reports to Canadian Rockburst Research Program (CRRP) consortium members.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Knowledge Infrastructure	
Fire Management:	
Develop new approaches and technologies for the management of wild fire which burns millions of hectares each year, and accounts for 25 percent of the cost of forest management in Canada. Sponsor an expert panel workshop to assess why forest fire activity in Canada is increasing.	A workshop of Canadian fire experts was convened during April 1-4, 1996, to determine the causes and effects of increased forest fire activity in Canada and to make recommendations. A workshop report including 14 recommendations for policy, management, information and research issues was published. As well, a report on some of the key implications of the recommendations was completed. (NRCan $40,000).
Implement the Canadian Wildland Fire Information System to monitor fire weather, fire behaviour and fire activity.	NRCan established a World Wide Web site to distribute cross-Canada weather and fire information to both fire management agencies and the general public.
Pending the transfer of the Civil Air Navigation System to Nav Canada, commence a five-year agreement starting April l, 1996, with Nav Canada to produce aeronautical charts and related products for civil aviation and for Nav Canada's internal operations while continuing to meet the needs of military aviation.	NRCan signed two five-year contracts, both estimated at $5 million, with Nav Canada and the U.S. National Imagery Mapping Agency, for provision of aeronautical products.
Business Line: Developing Federal Policy and Regulations	
Establish the policy framework for the disposal of radioactive waste and prepare drafting instructions for the legislation to formalize a *Radioactive Waste Act*.	The policy framework was announced in 1996. Follow-up consultations continue with major stakeholders.
Establish a process for public consultation on revisions to the *Nuclear Liability Act.*	Successful public consultations were held with all major stakeholders.
Initiate a major research effort to understand the relative contributions of natural sources of metal loadings in the environment and those resulting from human activity.	NRCan developed a new five-year Metals in the Environment (MITE) program, to begin operation in 1997-98. The program will examine the sources (human or natural) of metals in the environment and the behaviour of metals after release. Geoscientific information from this program will help in the formulation of federal policies and regulations for the national and international use of metals.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Develop and publish a revised set of user-friendly explosives regulations in plain language**.**	The development of Plain Language Explosives Regulations stalled during the 1996-97 review period due to resource shortages and priority shifts. The project has since resumed (and should be completed during the last quarter of the 1997-98 fiscal year).
Begin low level radioactive waste clean up operations in Surrey, Fort McMurray and Port Hope.	Clean-up operations continued at Port Hope. An environmental assessment to initiate the clean-up at Surrey was finalized, and the clean-up at Fort McMurray continued on a priority basis.

Policy Goal 9

To provide the information on Canadian land and resources needed for informed decision-making

Description

Canada's landmass has an area of almost 10 million square kilometres, and its offshore claims add half as much to the country's territory. Canada has some of the world's oldest rocks and some of the youngest. We have barren Arctic tundra and some of the world's richest farmland. We have 10 percent of the world's forests and 20 percent of its fresh water.

We are highly urbanized, yet rural Canada is a critically important component of our social and economic fabric, particularly when it comes to agriculture and natural resources. We also have remote Aboriginal communities with widely different cultures and needs.

In the knowledge-based economy, NRCan has a critical role to play in ensuring that its extensive databases, knowledge and expertise are available to Canadian decision-makers in an easy to use, technologically advanced way. This will require partnerships with other governments and with our clients. Knowledge of our land and natural resources is part of Canada's competitive advantage; it will translate into jobs and greater opportunities for Canadians.

Strategy

NRCan's strategy to achieve this goal is to:

- develop and maintain a national knowledge infrastructure for natural resources, including geoscience, geomatics, forestry, economic and statistical data;
- ensure that the department's information, knowledge and expertise are easily accessible;
- link the department's databases to relevant databases maintained by other agencies to the maximum extent possible;
- maintain a reliable survey system for Canada Lands as set out in the *Canada Lands Surveys Act*;
- maintain an effective boundary line between Canada and the United States in accordance with the international treaties and the *International Boundary Commission Act*; and,
- strengthen cooperation with other government departments, both federal and provincial/territorial, to ensure that there is no duplication among different agencies and that there are no gaps in the provision of information.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Forest Health:	
Establish a national health monitoring system that gives Canada a means of predicting future forest health conditions. Develop a design and strategy for implementing an enhanced forest health monitoring system.	NRCan scientists have developed a design for an improved forest health monitoring system. Protocols now being field tested across Canada (summer 1997) will be analyzed and adjusted before the start of the 1998 field season.
Biodiversity:	
Provide the scientific basis for the monitoring, reporting and conservation of forest biodiversity in Canada. Examine the effects of tree species density and fragmentation on reproduction and genetic diversity in natural forest populations.	NRCan, in collaboration with provincial and industrial partners, has made recommendations on how to maintain viable White pine populations by size and distribution in Newfoundland. Research continues to progress well in Ontario.
Describe forest fragmentation effects on mammal populations.	NRCan, in collaboration with provincial and industrial partners, conducted an evaluation of the "fragmentation" effects of old pine forest on selected mammal diversity in Ontario. It is presently investigating the effects of forest fragmentation on the American pine martin (a nationally endangered species) in Newfoundland. The goal is to determine at what levels fragmentation of forest habitat starts to affect mammal populations. This information should influence forest harvesting practices.
Landscape Management**:**	
In conjunction with Earth Sciences, develop computer-based models and information systems to assess Canada's forest and manage forest landscapes for timber, and environmental and esthetic values. Complete an initial framework for rapid forest management decision support systems, and transfer the technology to at least one forest partner.	NRCan has developed an initial framework for an Integrated Resource Management Decision Support System and transferred it to the B.C. Ministry of Forests, (approximately $100,000 was spent by NRCan and $100,000 by the B.C. Ministry of Forests).

1996-97 Commitments	1996-97 Accomplishments
Business Line: Science and Technology	
Complete and transfer to clients, decision support systems for forecasting the impact of several species of insect outbreaks on forest landscapes, identifying new areas at risk, and incorporating the effects into inventory projections.	A Spruce Budworm Decision Support System (SBDSS), implemented on 750,000 hectares of budworm-susceptible forest in New Brunswick, has been transferred to two forest product companies. A Spruce Weevil Attack (SWAT) system was implemented in the McGregor Model Forest, B.C., to reduce the damage done by this insect and to assess pest management strategies. A Mountain Pine Beetle Risk Rating System has been developed for Internet distribution to forest managers nationally. (An estimated $3 million was spent by NRCan and over $1 million from industrial and provincial partners.)
Develop and test a forestry simulation modelling database system and transfer it to three Model Forests.	NRCan developed three forest simulation modelling systems and transferred to them two Model Forests to date. NRCan developed an Integrated Resource Management Decision Support System, providing forest managers with harvest scheduling scenarios, and transferred it to the McGregor Model Forest in British Columbia. In cooperation with the Alberta Research Council, NRCan completed the ELDAR predictive site classification and mapping software and licensed it to Pearson-Timberline consultants. It has been used in successful pilot projects in the Foothills and the McGregor Model Forests. NRCan developed a decision support system for allocating protected areas to comply with biodiversity guidelines and transferred it to the B.C. Ministry of Forests. (An estimated $1 million was spent by NRCan and $500,000 by provincial, industry and Model Forest Partners on these projects).

1996-97 Commitments	1996-97 Accomplishments
Business Line: Knowledge Infrastructure	
Create an infrastructure allowing easy global access through the Internet to NRCan knowledge and information.	Launched the NRCan Knowledge Initiative (KI) in February 1997 as part of the department's improved service delivery to clients. A cross-sectoral Task Force was established which developed a concept paper for the KI and initiated work on developing an implementation plan.
Operate and maintain the Canada Lands Survey System (CLSS) which is the cadastral framework for all land-related economic development on Canada Lands.	CLSS completed 1126 Land Boundary Investigations and 1721 Plans Examinations. It issued and managed contracts worth $12.1 million. It has started digital reference plans, both as a basis for the Legal Survey Division Geographic Information System (GIS) and for clients needing this information.
Maintain secure custody of all original survey plans and related documents.	CLSS started work on a major project scanning the 42,000 plans in the Canada Lands Surveys Records (CLSR) and 15,000 Regional Surveyor Plans. Thus far, CLSS has scanned in 7,400 CLSR images and 9,700 Regional Surveyor Plans.
Continue to provide authoritative geographic research and information services on Canada, Canadian issues and geographic names; and maintain the National Atlas Data Base to support policy and resource development.	NRCan produced two poster maps, *Boreal Forest and Natural Hazards*, for inclusion in Canadian Geographic. In collaboration with the Environment Canada's Committee on the Status of Endangered Wildlife in Canada (COSEWIC), NRCan produced a module entitled "Wildlife at Risk" for the National Atlas on ShoolNet web site. The National Atlas site won the Canadian Internet Award in 1996 for the Best Academic or Educational Site. In conjunction with Geomatics International and the City of Burlington, NRCan produced a municipal-level electronic atlas, Municipal Mapper, available in CD-Rom form.
Perform economic statistical analysis and provide periodic publications and information products.	These were completed for the 1996-97 fiscal year.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Knowledge Infrastructure	
Provide ongoing operation, scientific and technical support to the Canadian Space Agency: in the reception and archiving of RADARSAT-I data; the implementation of the Earth Observation Programs as part of the Long Term Space Plan II; and the specification of RADARSAT-III.	The Canada Centre for Remote Sensing has provided the Canadian Space Agency with full management and technical services for most of the Earth Observation component of the Long Term Space Plan II. The data reception facilities are operating with above 99 percent efficiency for RADARSAT data. A senior manager has been assigned to the Agency to develop the Long Term Space Plan III and application scientists are closely involved in technical program planning.
Provide energy use information to Canadians.	Under NRCan's National Energy Use Database Initiative, the Canadian Energy End-Use Data and Analysis Centres delivered a number of important products, including EnerInfo, a newsletter about the development, management and analysis of data on energy end-use in the major energy-consuming sectors of the economy. The centres have their own Web sites to better inform stakeholders about their work on Canada's energy end-use. The 1996 edition (print and electronic) of the *Directory of Efficiency and Alternative Energy Programs in Canada*, which covers federal, provincial and territorial programs, as well as those from electric and gas utilities, was released. In addition, two reports reviewing results from the 1994 and 1995 Household Equipment Surveys were released: the statistical report *Survey of Canadian New Household Equipment Purchases 1994 & 1995* and the analysis report *The Household Equipment of Canadians: Features of the 1993 Stock & the 1994 & 1995 Purchases.*
Maintain an effective International Boundary between Canada and the United States.	Replaced boundary monuments and resurveyed a 230 km segment of the Ontario-Minnesota boundary; 710 boundary monuments were inspected; established 164 survey control points; cleared 55 km of the Manitoba-Minnesota boundary vista through contracting-out and 1.2 km of boundary vista along three portage areas on the Ontario-Minnesota boundary.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Complete a World Wide Web home page with links to mining information.	NRCan's Minerals and Metals Sector home page provides access to mineral statistics, branch and departmental reports and links with many other mining and mineral related sites. The home page also provides a request for information service, so that a client may directly and economically contact NRCan (see Section IV, D. Internet Addresses).
Increase public and industry awareness of NRCan mandate and activities.	National Forest Week (May 5-11) and National Mining Week (May 13-19) increased awareness of NRCan's activities in these two sectors through activities such as radio and TV advertising, ministerial and media articles and events, posters and a newspaper supplement.
Develop a plan for determining the outer limit of the seabed beyond 200 nautical miles, based on an interpretation of bathymetric and geological information according to the terms of the Law of the Sea, by outlining the costs and the benefits of such action. This plan will contribute to the process of deciding whether Canada should ratify the Law of the Sea.	Ongoing. Law of the Sea data compilations near completion. Drafting a Memorandum to Cabinet. Compilation of bathymetry data in northwest Atlantic near completion. Availability of bathymetry data in the Arctic investigated and international workshop initiated to address compilation of all data for use in Law of the Sea study.
Forest Health:	
Establish a national health monitoring system that gives Canada a means of predicting future forest health conditions. Complete Volume 4 of "Terrestrial Impacts in the State of Science Assessment," called for by the Federal/Provincial Energy and Environment Ministers.	NRCan submitted the final version of Volume 4 to Environment Canada. The report, based on information from federal departments, provinces and industry, presents the state of scientific knowledge on acid rain, the state of Canada's forests relative to acid rain, and 14 major conclusions.
Publish a special issue of *Canadian Journal of Forest Research*, entitled "Air Pollution and Multiple Stresses."	The special issue of the journal was published on April 4, 1996. The journal, consists of eight authoritative papers on the impacts of air pollution on forest ecosystems.
Finalize an MOU between NRCan and the Pest Management Regulatory Agency.	A draft MOU between the two organizations is currently being reviewed. The MOU outlines the commitment of both parties to work cooperatively to achieve their mutual responsibilities with respect to introduced forest pests and related quarantine issues.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Developing Federal Policy and Regulations	
Contribute to the 1996 report of the Canada/U.S. Air Quality Accord.	The *Canada/U.S. Air Quality Agreement Progress Report* was published in late 1996. It presents findings on all aspects of trans boundary air pollution (e.g., emissions, deposition monitoring and impacts on human and forest health). It concludes that acidic deposition can cause discernable effects in forests suffering from other forms of stress, such as drought or high-elevation temperature extremes. Symptoms of damage on ozone-sensitive trees have also been found.
Biodiversity**:**	
Provide the scientific basis for the monitoring, reporting and conservation of forest biodiversity in Canada. Bring together CFS scientific expertise to form a new research network in biodiversity.	The Biodiversity Network and a supporting Business Plan were established in 1996. Collaborative and partnership arrangements with other government departments, industry and Non-Government Organizations (NGOs) are ongoing.
Business Line: Promoting Canada's International Interests	
Demonstrate the use of RADARSAT data for the management of natural resources and the monitoring of the environment in tropical and arid countries, using programs such as GlobeSAR (Middle East and Far East) and PRORADAR (Brazil).	Eighty projects, including forestry, coastal zone monitoring and antarctic ice applications, are now underway in eleven countries in Central and South America . As a result of GlobeSAR initiatives, Canadian companies have expanded their sales networks and sales volume for information system software and training. Early commercial benefits are estimated to be in the millions of dollars.

3. Management Challenges

NRCan is committed to the good management of its internal resources. The continual change being experienced today gives rise to management and organizational challenges which need to be identified and properly managed. The actions the department has taken to address these challenges and the key 1996-97 accomplishments are outlined below.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
Management of Science and Technology:	
Complete an Impact Study of the National Remote Sensing Program.	An Impact Study of the National Remote Sensing Program was completed with participants from other government agencies, industry and academia. An assessment of the Program showed the department's remote sensing activities effectiveness in: employment creation; revenue generation; commercialization and market development; public good in the areas of environmental monitoring and sustainable development: safety and sovereignty; defence and intelligence; and, infrastructure development through regulations, education and training.
Complete a client survey on the Polar Continental Shelf Program.	A survey involving government departments and other Canadian Arctic research bodies concluded that the Polar Continental Shelf Program met or exceeded client expectations. The program appeared cost-effective in support of scientific field parties and in the level of service provided, including the physical safety environment for scientific productivity for their clients.
To facilitate systematic high-level consultation with clients on plans, programs and priorities.	Two meetings were held under the Minister's National Industrial Advisory Committee to the Geological Survey of Canada. As part of the departmental review of advisory bodies, a Geomatics Canada equivalent to the GSC committee was created; together, the two components form the Minister's National Advisory Board on Earth Sciences.
Establish and convene the NRCan Advisory Board on Energy S&T (NABEST) as a means of high-level client consultation on energy S&T strategy, programs and management practices.	NABEST was created to provide strategic advice for the delivery of energy S&T. The Board is composed of nine members representing a balanced diversity of energy interests and is to be chaired by Lorraine Goobie of Shell Canada.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
Management of S&T: cont'd.	
Complete a review of energy technology priorities and redefine the energy S&T portfolio.	Energy technology priorities were reviewed and the energy S&T portfolio redefined as of April 1, 1997. The new structure aligns six major program areas within three major components of the energy S&T portfolio: hydrocarbon resource development, energy efficiency and alternative renewable energy.
Implement an energy S&T Project and Management Information System to improve practices of: project design, management and accountability; effective monitoring of the organization, business and staff evolution, as well as key performance indicators.	A needs analysis was conducted and information requirements were established. A selection was proposed, based on a comparison of the tools identified, which considered integration within the existing architecture of the Government Financial System (GFS) and COE. The proposed technological tool integrates project and management information and should function with minimum adjustments at other energy technology research centres.
Create a new national advisory body to advise NRCan on forest research matters.	A National Advisory Board for Forest Research (NABFOR) was created to advise the Minister on the status, needs, opportunities and priorities for forest research. NABFOR consists of senior level representation from industry, academic, Aboriginal and environmental groups. As well, under the auspices of the CCFM, an S&T Working Group, consisting of provincial and territorial Assistant Deputy Ministers, was created to establish forest S&T priorities in relation to major national policy, trade, economic, environmental and social issues.
By 1997-98, begin a five year cycle of evaluating the performance of each forest S&T research network.	NRCan has established a proposed Peer Review process and schedule for use in evaluating the progress and performance for each of NRCan's 10 national S&T forest research networks.
Implement the federal S&T Strategy within NRCan.	NRCan played a leadership role government-wide. Within the department, NRCan: completed and implemented an S&T Management Framework; published and disseminated a compendium of S&T management practices and a revenue generation framework; put in place an external advisory structure including a Minister's Advisory Council on S&T and sectoral advisory boards; initiated an S&T Youth

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
Management of S&T: cont'd.	Internship program; contributed to an R&D Impact Network; and developed an S&T training and development pilot, including a mobility of scientists component.
Begin operating CFS' research program as 10 national networks, led by specific regional centres and complete three-year business plans outlining resources and deliverables for each network.	NRCan's 10 national forest S&T research networks consisting of: Forest Biodiversity; Forest Health; Forest Ecosystem Processes; Pest Management Methods; Tree Biotechnology and Advanced Genetics, Effects of Forestry Practices; Socio-Economic Research; Climate Change; Landscape Management; and Fire Management became fully operational in 1996-97. A Network Manager's Information System (NMIS) has been developed to link managers, scientists and support staff under the 10 networks and enable the efficient exchange of information on research studies, objectives, deliverables and progress, (estimated development costs of the system were $100,000 (O&M) plus the salary equivalent of two FTEs).
Quality Service:	
Implement the second year of a two-year quality service action plan (1995-97) focusing on 15 key areas, linked to quality, that managers and employees felt should be acted upon.	NRCan surveyed its employees to determine their awareness of, and adherence to, quality assurance programs and revised its plans accordingly. The department developed a new program of rewards and recognition. It communicated its quality program through a manager's guide, an Internet site, training and participation activities during National Public Service Week, Interdepartmental Quality Network and Quality month.
Promote a common understanding of the principles of Quality, of what they mean to the delivery of the Activity's programs, and of the roles and responsibilities of employees. In 1996-97, the Activity will continue to implement and improve: - service standards; - mechanisms for regular client consultations;	Service Standards: Earth Sciences Sector (ESS) continued to provide leadership in the area of Service Standards by publishing *Service Standards for External Clients*. In addition, a Service Pledge was developed by the ESS Network of Service Standards Coordinators. Client consultations: A Service Quality Survey of approximately 200 ESS clients and stakeholders was completed, analysed and where feasible was

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
Quality Service: cont'd.	
- mechanisms to improve business processes; and - a system of performance measurement.	incorporated into the Sector's Service Standards. In addition, a Client Satisfaction Survey associated with Industrial partners program projects was completed. Enhanced Business Process: the following processes were developed: - development of an International Business Strategy; - production of the first ESS contracting-out bulletin; - production of a Manager's Guide to the ESS Revolving Fund; - preparation and publication of the first ESS business plan; - a database to administer and manage the Sector's MOU was developed; and - development of a process map for business aspects of collaborative research projects. Performance measurement: Completed an evaluation of the best method to apply performance measurement in the Sector. The balanced scorecard approach was identified and seven performance measures selected for implementation in 1997-98.
Develop Total Quality plans and procedures to promote the effectiveness and efficiency of service to Energy Sector clients.	The Quality Manual, representing the first level towards ISO 9002 certification, was produced and approved for one of ES' divisions. A survey of energy industries, undertaken in conjunction with Alberta, was completed and the results of this survey will influence the sector's international priorities.
Obtain ISO 9001 certification for the operation of the Topographic Data Base and for the production and delivery of selected aeronautical charts and related products. Examine the feasibility of seeking ISO 9001 certification for other products, such as geological maps and geophysical data sets, and follow through on obtaining certification whenever possible.	Certification for the operation of the Topographic Data Base was officially received December 6, 1996. Information on website (http://www.nrcan.gc.ca/css/ imb/ hqlib/relf97.htm). Aeronautical Charts commenced the implementation of the ISO 9001 quality management system for aeronautical charts and related products, and completed an internal audit in preparation for official ISO certification. Discussions on the feasibility of seeking ISO 9001 certification have taken place and are continuing.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
Communications:	
Assist the Minister in communicating corporate responsibilities and contribute proactively, both within and outside the department, to the awareness and understanding of NRCan's activities and how these relate to the government's overall responsibilities.	The department issued a total of 601 communications products, including news releases, speeches and communications plans, covering 43 projects. In addition, it planned and implemented National Forestry Week and National Mining Week; developed a media action plan for NRCan science and technology; and developed departmental standards for public opinion research.
Environmental Stewardship:	
Reduce NRCan's domestic water usage by 30 percent.	Through the Federal Building Initiative, NRCan installed water conservation devices at five major departmental sites across Canada. The results indicate an overall reduction of 23.2 percent in domestic water usage at these sites compared to 1994-95.
Assess NRCan's environmental management systems (EMS).	Although many of the components of an effective EMS are already in place at NRCan, a departmental survey of 308 employees has identified gaps between the existing EMS and the accepted ISO 14000 series model. Improvements to the system are ongoing.
Organizational Renewal:	
Implement first phase of the Human Resources (HR) Management System project (PeopleSoft) in HR Branch	The application went from testing into production on April 1, 1997.
Implement the Goods and Services redesigned services, and develop a functional design for the financial management and analysis services including reporting mechanisms.	The redesign of the Goods and Services process (Integrated Procurement and Payment System) began in 1996-97 and should finish at the end of 1997-98 at a cost of $3.5 million. The project will improve service delivery for procurement of goods and services and the payment of invoices by decreasing turn-around time and minimizing human intervention and the use of paper. The financial management and analysis services functional design was delayed to 1997-98.
To re-orient and streamline job classification to facilitate more effective service delivery.	In January 1996, NRCan began development of an Internet-based Data Bank for 240 broad-banded, pre-classified work descriptions covering all work in NRCan except for the EX and RES occupational groups. It will be completed in September 1997.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
Organizational Renewal: cont'd.	
Complete the project Management and Scientific Development and Training (MSDT).	The *MSDT Recommendations Report* was approved in 1996-97. Pilot implementation will begin in 1997-98.
Initiate the approved option from the *Strategic Accommodation Plan*.	NRCan approved the Strategic Accommodation Plan, which sets out the macro objectives of the department in the management of its facilities and land holdings. Implementation of this multi year plan has commenced.
To continuously improve work force adjustment activities.	Management of work force adjustment was improved by developing a quarterly report to monitor the impact of reductions and by revising the reverse order of merit process and the layoff process. A departmental HR committee was created to provide strategic direction on all issues related to HR management. The Casual Employment policy was revised to meet newly identified needs.
Continue to implement the Employment Equity Program through various projects such as the Aboriginal Summer Student Recruitment Program (60 planned for employment in 1996-97), and delivery of a workshop on people skills in a diverse and changing organization.	Seventy Aboriginal students were employed in CFS in 1996-97. NRCan offered three workshops on flexible work arrangements. A pilot Science Personnel Mobility Interdepartmental Exchange Program, offered in cooperation with three other science-based departments, will encourage employees to learn new skills and exchange information of common interest related to science programs.
Complete the integration of the policy and science elements of the Energy Sector reflecting changes outlined in the departmental restructuring announced in the Fall of 1995.	Integration of the policy and science elements in ES was completed in the area of strategic planning. The integration process continues in areas such as performance measurement.
Reduce Energy Sector resources based upon recommendations from the Program Review exercise.	ES met Program Review reductions set for 1996-97.
Common Office Environment (COE):	
Initiate projects dealing with common networks, common office automation tools, and common administrative applications.	In January 1997, the Departmental Management Committee approved the implementation of a Common Office Environment across the department. Planning on some aspects continued into the 1997-98 fiscal year, with implementation to desktops scheduled to begin in spring 1997. The balance of the implementation activities are planned for 1997-98 fiscal year.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
COE: cont'd.	
Develop and implement an Information Warehouse for administrative information.	The Information Warehouse concept was evaluated in 1996-97. It was deferred to incorporate the results of the Information Management Framework study and Knowledge Initiative and is under consideration as an element of COE Phase II.
Make available departmental access to X.500 directory services through the Enterprise Electronic Mail System.	This was implemented in 1996-97.
Implement a common scheduler.	A common scheduler is just one component of the COE project. The scheduler chosen is closely linked to the e-mail system (Microsoft Exchange and Schedule+). It will be implemented along with Exchange in 1997.
Implement an enterprise-wide distribution list facility for paper-based and electronic information.	The list facility was developed and implemented in 1996-97. Intensive marketing will take place in 1997-98 for more widespread use.
Provide Internet-based access to the CD-ROM and Information Services repositories.	Met.
Electronic Document Management (EDMS):	
Implement on-line service to Corporate Services Sector (CSS).	CSS implemented an EDMS system in 50 percent of the offices in CSS and the Executive Offices in 1996-97.
Add an imaging/routing EDMS component for CSS.	CSS has recently completed a pilot project which included the imaging of financial transactions. It will further develop EDMS technologies within COE Phase II.
WAN/Telecommunications Infrastructure:	
Following the implementation of Frame Relay technology across the departmental wide area network, re-engineering the local area networks (LAN) on the Booth Street campus will provide additional infrastructure efficiencies and increased capabilities.	The Frame Relay network has been designed and implemented. Planning and implementation have begun for the Asynchronous Transfer Mode (ATM) network.

1996-97 Commitments	1996-97 Accomplishments
Business Line: Corporate Management and Administration	
Information Resource Centre:	
By the end of 1996, a Common Information Resource Centre will be in place including a consolidation of the Library and the Record Offices.	Since this approach was announced, a number of related initiatives were launched, namely, the Information Management (IM) Road Map and the Knowledge Initiative. Both of these initiatives recommended specific directions currently under review by senior management. As well, a review of the HQ and CANMET libraries was conducted by an independent consulting firm which recommended a merger of the two libraries in the short term , and a merger of all libraries in the National Capital Region in the longer term.
NRCan Business Planning:	
Make improvements to the NRCan business planning process.	The departmental planning process has been aligned with the Government's annual planning cycle.

4. Total Planned versus Actual Spending Tables

Figure 1. Resource Requirements by Sector and Business Line

Comparison of Total Planned to Actual Expenditures, 1996-97 by Sector and Business Line

Note: Shaded numbers denote actual expenditures/revenues in 1996-97.

($ millions)

	BUSINESS LINES							
Organization	Science and Technology	Knowledge Infrastructure	Policy and Regulations	Promoting Canada's International Interests	Sunset / Special Programs	Corporate Management & Administration	Geomatics Canada Revolving Fund	TOTALS
Earth Sciences	43.6	110.6	9.1	1.6	0	0	0.5	165.4
	46.5	116.7	9.6	1.7	0	0	(1.2)	173.3
Forest	94.2	1.3	6.4	3.1	13.0	0	0	118.0
	101.2	1.6	7.4	3.5	12.9	0	0	126.6
Minerals and Metals	32.8	3.4	8.8	1.9	8.7	0	0	55.6
	31.5	3.2	7.4	1.8	10.1	0	0	54.0
Energy	60.6	3.0	35.6	2.0	17.0	0	0	118.2
	54.2	1.7	36.7	2.0	28.9	0	0	123.5
Corporate Services, Direction & Coordination	12.6	8.4	1.7	0.5	1.2	41.4	0	65.8
	16.3	3.1	1.3	0.2	0.2	50.4	0	71.5
TOTALS [1]	243.8	126.7	61.6	9.1	39.9	41.4	0.5	523.0
	249.7	126.3	62.4	9.2	52.1	50.4	(1.2)	548.9
% of TOTAL	45.5%	23.0%	11.4%	1.7%	9.5%	9.2%	-0.2%	100.0%

1. Actual expenditures are $548.9 million, a net increase of $25.9 M from 1996-97 Main Estimates. The major changes are due to: inclusion of the carry forward in the 1996-97 budget, statutory payments resulting from adjustments to the Nova-Scotia Offshore Revenue Equalization Offset Payment, Interprovincial Pipeline Incorporated and Canada-Nova Scotia and Newfoundland Development fund and a contribution to the National Fusion Program.

Figure 2. Comparison of Total Planned Spending to Actual Expenditures, 1996-97 by Business Line

Note: Shaded numbers denote actual expenditures/revenues in 1996-97.

($ millions)

Business Line	FTE's	Operating (1)	Capital	Voted Grants and Contributions	Subtotal: Gross Voted Expenditures	Statutory Grants and Contributions	Total Gross Expenditures	Less: Revenue Credited to the Vote	Total Net Expenditures
Science and Technology	1,910	202.9	12.8	28.7	244.4	0	244.4	0.6	243.8
	1,884	217.3	17.7	27.3	262.3	0	262.3	12.6	249.7
Knowledge Infrastructure	1,070	120.0	5.1	1.6	126.7	0	126.7	0	126.7
	1,076	125.8	0	2.5	128.3	0	128.3	2.0	126.3
Policy and Regulations	495	51.6	1.1	6.6	59.3	2.3	61.6	0	61.6
	466	57.4	0.2	3.5	61.1	2.5	63.6	1.2	62.4
Promoting Canada's International Interests	75	8.8	0.3	0	9.1	0	9.1	0	9.1
	77	9.3	0	0	9.3	0	9.3	0.1	9.2
Sunset / Special Programs	67	7.6	0.7	14.6	22.9	17.0	39.9	0	39.9
	64	8.2	0	15.0	23.2	28.9	52.1	0	52.1
Corporate Management & Administration	526	41.4	0	0	41.4	0	41.4	0	41.4
	498	48.9	1.4	0.1	50.4	0	50.4	0	50.4
Geomatics Canada Revolving Fund	0	17.6	0	0	17.6	0	17.6	17.1	0.5
	0	16.4	0	0	16.4	0	16.4	17.6	(1.2)
Totals [2]	4,143	449.9	20.0	51.5	521.4	19.3	540.7	17.7	523.0
	4,065	483.3	19.3	48.4	551.0	31.4	582.4	33.5	548.9

Other Revenues and Expenditures and Revenue credited to the Consolidated Revenue Fund	(33.1)
	(34.1)
Cost of services provided by other departments [3]	31.5
	21.2
Net Cost of the Program	521.4
	536.1

1. Operating includes contributions to employee benefit plans and ministers' allowances.
2. See note (1) on Figure 1.
3. Actual expenditures do not include the costs of service provided without charge by other departments.

Figure 3. Departmental Planned versus Actual Spending by Business Line

($ millions)

Business Lines	Actual 1993-94 (1)	Actual 1994-95 (1)	Actual 1995-96	Total Planned 1996-97	Actual 1996-97
Science and Technology	--	--	280.0	243.8	249.7
Knowledge Infrastructure	--	--	146.4	126.7	126.3
Policy and Regulations	--	--	73.5	61.6	62.4
Promoting Canada's International Interests	--	--	10.8	9.1	9.2
Corporate Management & Administration	--	--	54.0	41.4	50.4
Sunset / Special Programs	--	--	259.4	39.9	52.1
Sub-total	1,030.1	1,686.4	824.1	522.5	550.1
Geomatics Canada Revolving Fund			2.0	0.5	(1.2)
Total Budgetary (2)	1,030.1	1,686.4	826.1	523.0	548.9

1. Distribution of 1993-94 and 1994-95 expenditures by business line is not available since the new business line structure was approved by TB on October 31, 1996 (TB #824593).

2. Actual expenditures are $548.9 million, a net increase of 25.9 M from 1996-97 Main Estimates. The major changes are due to: inclusion of the carry forward in the 1996-97 budget, statutory payments resulting from adjustments to the Nova Scotia Offshore Revenue Equalization Offset Payment, Interprovincial Pipeline Incorporated and Canada-Nova Scotia and Newfoundland Development Fund and a contribution to the National Fusion Program.

C. Key Reviews

Results of Evaluation Studies
International Forestry Partnerships Program (IFPP): The evaluation showed that the IFPP has contributed to achieving its overall purpose to protect Canada's forestry products trade in Europe and promote Canada's image as an environmentally responsible forestry nation. The IFPP is creating a network of people who are informed about Canadian forestry practices.
Polar Continental Shelf Project (PCSP): The survey of PCSP's clients found that the logistical services provided in the Canadian Arctic and the Arctic Ocean are viewed as being cost effective, with 93 percent of total expenditures benefiting scientific field parties. Users were satisfied with the level and amount of services provided and felt the same services could not be obtained elsewhere for less. Operations were found to ensure maximum physical safety and scientific productivity for their clients. The survey concluded that PCSP met or exceeded expectations.
Model Forest Program (MFP): An evaluation of the MFP found that considerable progress had been made in furthering sustainable forest management, establishing partnerships among diverse groups and developing tools for sustainable forest management. A national committee recommended the Program be modified and extended for five additional years.
Mine Environmental Neutral Drainage (MEND): The evaluation found that MEND is an internationally recognized model of government industry cooperation, producing a wide variety of useful knowledge and potential solutions to the acid mine drainage problem; creating a common understanding among participants allowing operators to take action with greater confidence; and, gaining multi-stakeholder acceptance more quickly. The evaluation identified three top priorities to focus on until MEND's expected completion in 1997: to complete current projects and outstanding work and plan for future efforts; complete and publish an integrated manual; and, continue and extend technology transfer initiatives.
Results of Internal Audits
Environmental Management System (EMS): The audit recommended: establishment of a formal project for implementing an EMS; assumption of increased management responsibility for the EMS; development of a formal communications strategy; and, development of an overall policy to explain the departmental program. NRCan has chosen to follow recognized standards (CSA and ISO) as guidelines in developing its EMS.
Corporate Management Projects: Internal Audit conducted concurrent reviews of a number of re-engineering projects and related systems implementations that Corporate Services Sector is undertaking to improve service delivery to its client sectors and a project to help prepare departmental systems for the year 2000. The re-engineering projects reviewed included: the Common Office Environment planning and pilot phases; the Goods and Services re-engineering phase and the Integrated Procurement and Payment System feasibility study; the Human Resources (Classification) re-engineering project; and implementation of the PeopleSoft human resources system. The reviews assessed those areas of the re-engineering projects that required further senior management attention for effective development and implementation. The Year 2000 review gave an assessment of the state of the department's preparations for entry into the next millennium.

Other Key Reviews
International Energy Agency's Collaborative Technology Agreements (CTAs): Participation in the IEA's Collaborative Technology Agreements has been highly beneficial for Canada. The Net Present Value of the benefits over the period 1986-2001 is estimated to be $24.7 million.
R&D Investments in Minerals and Metals: The review of 62 government science and technology projects that were carried out in cooperation with public and private partners over the past several years, shows these projects have impacted positively on Canada's technology infrastructure. The projects have been instrumental in the generation of economic benefits and the development of valuable knowledge and techniques in the fields of environment, health and safety, and regulatory development.
National Remote Sensing Program: An assessment of the effectiveness of the national Remote Sensing Program as public sector R&D showed that Natural Resource Canada's remote sensing activities contributed to employment creation, revenue generation, commercialization, technology transfer and market development; public good in the areas of environmental monitoring and sustainable development, safety and sovereignty, defence and intelligence; and, infrastructure development through regulations and education and training.
Federal Code for Environmental Stewardship — Auditor General of Canada, May 1996: In this government-wide audit, the Auditor General indicated that the strategic framework for environmental stewardship is not being implemented as foreseen in 1991 and recommended that is was a good time to review progress and make improvements. Since the introduction of the federal Code, NRCan has worked toward implementing Environmental Stewardship by introducing an environmental auditing policy and program, developing action plans (1992, 1993, 1996), producing progress reports in 1993 and 1996 and a protection and assessment policy in 1996, and initiated development of a departmental Environmental Management System (see above, Results of Internal Audits).
Federal Contaminated Sites — Auditor General of Canada, November 1996: The Auditor General reviewed management information among 12 departments, including NRCan, on the environmental costs and liabilities of federal contaminated sites. Since 1992, NRCan officials have been assessing and managing proactively its contaminated sites. Of the five potentially contaminated sites identified, three were determined to be significantly contaminated. Two of these sites have already been cleaned up and the third was assessed to be only a low risk situation that did not require urgent remedial action.
Materiel Management — Auditor General of Canada, November 1996: NRCan was one of four departments included in the Auditor General's review of materiel management. NRCan has responded to the recommendations by establishing a working group to improve the policy and the management framework and is developing the necessary information systems and record keeping through its Corporate Management re-engineering projects.

IV. Supplementary Information

A. Financial Summary Tables

1. Summary of Voted Appropriations

Authorities for 1996-97 - Part II of the Estimates

Financial Requirements by Authority ($ millions)

Vote	Program	1996-97 Main Estimates	1996-97 Actual
1	Operating expenditures	400.6	418.8
5	Capital expenditures	20.0	19.3
10	Grants and contributions	51.5	48.4
(S)	Minister of Natural Resources - Salary and motor car allowance	0.1	0.1
(S)	Contributions to employee benefit plans	31.0	32.1
(S)	Payments to Interprovincial Pipe Line Incorporated in respect of deficiencies related to the Montreal extension	2.0	--
(S)	Canada-Nova Scotia Development Fund	6.0	0.3
(S)	Canada-Newfoundland Development Fund	6.5	4.2
(S)	Canada-Newfoundland Offshore Petroleum Board	1.6	1.7
(S)	Canada-Nova Scotia Offshore Petroleum Board	0.7	0.9
(S)	Payments to the Nova Scotia Offshore Revenue Account	2.5	4.4
(S)	Payments to the Newfoundland Offshore Petroleum Resource Revenue Fund	--	0.1
(S)	Geomatics Canada Revolving Fund	0.5	(1.2)
(S)	Nova Scotia Offshore Revenue Equalization Offset Payment	--	19.8
	Total Budgetary [1]	523.0	548.9
L15	Loans pursuant to Hibernia development project	66.0	66.0
	Total Department	589.0	614.9

1. Actual expenditures are $548.9 million, a net increase of 25.9 M from 1996-97 Main Estimates. The major changes are due to: inclusion of the carry forward in the 1996-97 budget, statutory payments resulting from adjustments to the Nova Scotia Offshore Revenue Equalization Offset Payment, Interprovincial Pipeline Incorporated and Canada-Nova Scotia and Newfoundland Development Fund and a contribution to the National Fusion Program.

2. Revenues to the Consolidated Revenue Fund (CRF) by Business Line

($ millions)

Business Lines	Actual 1993-94 (1)	Actual 1994-95 (1)	Actual 1995-96	Total Planned 1996-97	Actual 1996-97
Science and Technology (2)	--	--	15.6	15.9	2.6
Knowledge Infrastructure (2)	--	--	3.9	1.1	1.3
Policy and Regulations (2)	--	--	3.0	2.1	3.8
Promoting Canada's International Interests (2)	--	--	0.2	0.1	0.2
Corporate Management & Administration (3)	--	--	1.7	0.1	2.8
Sunset / Special Programs (4)	--	--	15.1	12.7	22.2
Geomatics Canada Revolving Fund	--	--	1.5	1.1	1.2
Total Revenues to the CRF	139.3	35.6	41.0	33.1	34.1

1. Distribution of 1993-94 and 1994-95 expenditures by business line is not available since the new business line structure was approved by TB on October 31, 1996 (TB #824593).

2. Effective April 1, 1996, TB approved NRCan's modifications to the Vote Netting Authority (TB #824456) which resulted in a lowering of the departmental's A-Base.

3. Corporate Management and Administration actuals for 1996-97 include revenues for Corporate Accounts such as proceeds from the sale of crown assets and GST tax revenues.

4. Increase in revenue is due to larger than anticipated Interprovincial Pipeline and Newfoundland and Nova Scotia Offshore revenues.

3. Revenues to the Vote by Business Line

($ millions)

Business Lines	Actual 1993-94 (1)	Actual 1994-95 (1)	Actual 1995-96	Total Planned 1996-97	Actual 1996-97
Science and Technology (2)	--	--	0.2	0.6	14.4
Knowledge Infrastructure (2)	--	--	0	0	0.2
Policy and Regulations (2)	--	--	0	0	1.2
Promoting Canada's International Interests (2)	--	--	0	0	0.1
Corporate Management & Administration	--	--	0	0	0
Sunset / Special Programs	--	--	0	0	0
Geomatics Canada Revolving Fund	--	--	13.1	17.1	17.6
Total Revenues to the Vote	2.7	12.3	13.3	17.7	33.5

1. Distribution of 1993-94 and 1994-95 expenditures by business line is not available since the new business line structure was approved by TB on October 31, 1996 (TB #824593).

2. Effective April 1, 1996, TB approved NRCan's modifications to the Vote Netting Authority (TB #824456) which resulted in a lowering of the departmental's A-Base.

4. Transfer Payments by Business Line

($ millions)

Business Lines	Actual 1993-94 (1)	Actual 1994-95	Actual 1995-96	Total Planned 1996-97	Actual 1996-97
GRANTS					
Science and Technology	--	0.1	0.1	0.3	0.2
Knowledge Infrastructure	--	0.2	0.1	0.2	1.2
Policy and Regulations	--	0.2	0.2	0.2	0.1
Promoting Canada's International Interests	--	0	0	0	0
Corporate Management & Administration	--	0	0	0	0
Sunset / Special Programs	--	0	0	0	0
Total Grants	1.1	0.5	0.4	0.7	1.5
CONTRIBUTIONS					
Science and Technology	--	35.1	31.6	28.4	27.1
Knowledge Infrastructure	--	1.2	1.4	1.3	1.3
Policy and Regulations	--	8.2	8.2	8.8	6.0
Promoting Canada's International Interests	--	0	0	0	0
Corporate Management & Administration	--	0	0	0	0
Sunset / Special Programs	--	567.9	237.4	31.6	43.9
Total Contributions	427.4	612.4	278.6	70.2	78.3
Total Grants and Contributions (2)	428.5	612.9	279.0	70.8	79.8

1. Distribution of 1993-94 expenditures by business line is not available since the new business line structure was approved by TB on October 31, 1996 (TB #824593).

2. The major changes are due to costs associated to statutory payments (such as Nova-Scotia Revenue Equalization Offset Payment, Nova-Scotia Offshore Revenue Account, Interprovincial Pipeline Incorporated) and the grant to the Royal Canadian Geographic Society.

5. Statutory Payments by Business Line/Activity

($ millions)

Business Lines	Actual 1993-94 (1)	Actual 1994-95 (1)	Actual 1995-96	Total Planned 1996-97	Actual 1996-97
Science and Technology	--	--	16.2	14.5	15.1
Knowledge Infrastructure	--	--	9.1	8.1	8.4
Policy and Regulations	--	--	6.7	6.3	6.5
Promoting Canada's International Interests	--	--	0.5	0.6	0.6
Corporate Management & Administration	--	--	4.1	3.6	3.7
Sunset / Special Programs	--	--	46.4	17.3	29.3
Geomatics Canada Revolving Fund	--	--	2.0	0.5	(1.2)
Total Statutory Payments (2)	83.6	69.2	85.0	50.9	62.4

1. Distribution of 1993-94 and 1994-95 expenditures by business line is not available since the new business line structure was approved by TB on October 31, 1996 (TB #824593).

2. The variance is due principally to the increase contribution associated to the statutory payments (such as Nova-Scotia Revenue Equalization Offset Payment, Nova-Scotia Offshore Revenue Account, Interprovincial Pipeline Incorporated) and the grant to the Royal Canadian Geographic Society.

6. Loans, Investments and Advances

($ millions)

Business Lines	Balance 1993-94	Balance 1994-95	Balance 1995-96	Total Planned 1996-97	Balance 1996-97
Loans					
Science and Technology	--	--	--	--	--
Knowledge Infrastructure	--	--	--	--	--
Policy and Regulations	--	--	--	--	--
Promoting Canada's International Interests	--	--	--	--	--
Corporate Management & Administration	--	--	--	--	--
Sunset/Special Programs	--	--	--	--	--
Regional Electrical Interconnections New Brunswick Electric Power Commission	5.5	5.3	5.1	--	5.0
Hydro-Quebec Research Institute (1)	6.4	6.1	--	--	--
Atomic Energy of Canada Ltd.					
Housing	1.2	0.1	0.6	--	0.4
Heavy Water Inventory	14.5	13.5	12.5	--	11.5
Loans to facilitate the implementation of the Hibernia Development Project	--	--	66.0	66.0	132.0
Total Loans	27.6	25.0	84.2	66.0	148.9
Investments and Advances					
Science and Technology	--	--	--	--	--
Knowledge Infrastructure	--	--	--	--	--
Policy and Regulations	--	--	--	--	--
Promoting Canada's International Interests	--	--	--	--	--
Corporate Management & Administration	--	--	--	--	--
Sunset/Special Programs	--	--	--	--	--
Advances to the Corporation pursuant to the Cape Breton Development Corp. Act (2)	--	5.0	15.5	--	0.1
Lower Churchill Development Corporation	14.7	14.7	14.7	--	14.7
Payments with respect to Canada's participation in the capital construction phase of the Lloydminster Heavy Oil Upgrader (3)	526.4	--	--	--	--
Payments with respect to Canada's share of the operating shortfall of the Lloydminster Heavy Oil Upgrader (4)	25.6	--	--	--	--
Atomic Energy of Canada Ltd.	164.2	164.2	164.2	--	164.2
Total Investments and Advances	730.9	183.9	194.4	0	179.0
Total	758.5	208.9	278.6	66.0	327.9

1. Hydro-Quebec Research Institute loan paid off in full in the 1995-96 fiscal year.
2. Transfer from Industry Canada to NRCan on April 1, 1995.
3. The Lloydminster capital construction investment was sold to Crown Investments Corporation (Saskatchewan) and Husky Oil, Operations Ltd. for $42 million on February 2, 1995 and the balance was written off pursuant to Natural Resources Vote 3d, Appropriation Act No.4, 1994-95.
4. Following the sale of the Government's equity interest on February 7, 1995, the balance of the operating shortfall advances were written off pursuant to Natural Resources Vote 3d, Appropriation Act No.4, 1994-95.

7. Revolving Fund Financial Summaries

The Fund was established under Appropriation Act No 3 in 1993-94 for the purpose of carrying out the operation of the revenue-generating activities of Geomatic Canada. At the same time, the Fund received a continuing non-lapsing authority from Parliament to make payment out of the Consolidated Revenue Fund, not to exceed $8 million at any time.

The Fund revenue-generating activities can be broken down into three elements: products, which include maps and digital products, services and consulting. They provide to various clients an increasing volume of products and services suitable for industry distribution, value-added services and help to strengthen the geomatic industry on the international market. They also contribute to the achievement of NRCan goals and objectives.

The following financial table provides highlights of the Fund operations for the last three fiscal years.

- In terms of revenue, the Fund has increased its revenues by $1.3 million or 8% when compared to 1995-96. This increase is due to a significant increase in digital products sale as a result of Geomatic Canada accreditation to ISO 9001 quality standards, in the AERO charts and to a constant marketing effort toward the international communities which has lead to a 57% increase in consulting revenues. The Fund was also able to maintain the increase of its expenditures at only 1% when compared to 1995-96. Good project management and a constant effort to maintain costs as low as possible were key success factors achieved by the management of the Fund.

- The table also shows that there was a significant improvement in cash management in 1996-97. The Fund replenished the drawdown authority by $1.1 million by increasing its effort in collecting its accounts receivable and managing its accounts payable.

- The Geomatic Canada Management Team is committed to providing quality products and services to the Canadian geomatic industry and all other clients while respecting government rules and directives concerning the management of the revolving fund. From a forecasted accumulated deficit of $1.3 million at the time of establishment, the Fund is proud to show an accumulated surplus of $1.1 million after its third year of operation.

Geomatics Canada Revolving Fund

($ millions)

	Actual 1994-95	Actual 1995-96	Total Planned 1996-97	Actual 1996-97
Revenues				
Products	7.9	9.4	--	10.3
Services	4.0	4.2	--	3.5
Consulting	0.7	1.9	--	3.0
Total Revenues	12.6	15.5	16.9	16.8
Expenditures [1]	13.2	15.2	16.9	15.4
Profit (Loss)	(0.6)	0.3	0	1.4
Changes in Working Capital	1.1	(4.2)	(0.4)	0.4
Capital Acquisitions	(0.2)	(0.3)	(0.1)	(0.1)
Other Items	0.1	0.2	--	0.2
Cash Requirements	0.4	(4.0)	(0.5)	1.9
Cash at April 1	--	0.4	--	(3.6)
Cash at March 31	0.4	(3.6)	(0.5)	(1.7)
Year-End Adjustments	(1.7)	0.3	--	(0.5)
Cumulative Net Authority Used [2]	(1.3)	(3.3)	(0.5)	(2.2)

1. Includes cost of goods sold.
2. The net authority used represents the cash situation of the fund at the end of the government accounting year which is different from that of the Geomatics Canada Revolving Fund.

8. Contingent Liabilities

($ millions)

List of Contingent Liabilities	Current Amount of Contingent Liability
Loan guarantee with respect to the Hibernia Development Project Act	1,494.0
Loan guarantee to Newgrade Energy Inc. to finance construction of a heavy oil upgrader	150.0
Pending and threatened litigation	55.4

B. Acts Administered in whole or in part by NRCan

Department of Natural Resources Act
Resources and Technical Surveys Act
Forestry Act
Arctic Waters Pollution Prevention Act
Canada Labour Code [1]
Canada Lands Surveys Act
Canada-Newfoundland Atlantic Accord Implementation Act
Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act
Canada Oil and Gas Operations Act
Canada Petroleum Resources Act
Federal Real Property Act [2]
Hibernia Development Project Act
Cooperative Energy Act
Energy Administration Act
Energy Efficiency Act
Energy Monitoring Act
Energy Supplies Emergency Act
National Energy Board Act
Atomic Energy Control Act
Nuclear Liability Act
Nuclear Safety and Control Act [3]
Canadian Home Insulation Program Act [4]
Canadian Ownership and Control Determination Act
Canadian Exploration and Development Incentive Program Act [4]
Canadian Exploration Incentive Program Act [4]
Oil Substitution and Conservation Act
Petroleum Incentives Program Act [4]
Home Insulation (N.S. and P.E.I.) Program Act [4]
Explosives Act
International Boundary Commission Act
Financial Administration Act
Cape Breton Development Corporation Act
Canadian Wheat Board Act

1. Although this Act is administered by Labour Canada, the Oil and Gas Occupational Safety and Health Regulations, made under this Act, are the joint responsibility of Labour Canada, Indian and Northern Affairs Canada and Natural Resources Canada.
2. Although this Act is administered by the Treasury Board, the Public Lands Mineral Regulations and the Public Lands Oil and Gas Regulations, each made under this Act's predecessor (the Public Lands Grants Act), remain in force and are the responsibility of Natural Resources Canada. In addition, the Canada Mining Regulations and the Canada Oil and Gas Land Regulations, each made under the Public Lands Grants Act and the Territorial Lands Act, are the joint responsibility of Indian and Northern Affairs Canada and Natural Resources Canada.
3. Act has received Royal Assent but will come into force on a day when an Order of the Governor in Council is fixed.
4. Act is in force but dormant.

C. Contacts for further information

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D. Internet Addresses

General:

Natural Resources Canada Home Page – **http://www.nrcan.gc.ca/home/p2int_e.htm**
Canadian Forest Service (Headquarters) – **http://www.nrcan.gc.ca/cfs**
Corporate and Executive Services – **http://www.nrcan.gc.ca/css/emp/css%2die.htm**
Earth Sciences Information Centre – **http://www.nrcan.gc.ca/ess**
Energy Sector – **http://www.es.nrcan.gc.ca**
Minerals and Metals Sector – **http://www.nrcan.gc.ca/mms**

Earth Sciences Sector Sites:

Aerial Photography – **http://www.geocan.nrcan.gc.ca/napl-pna**
Aeronautical Charts – **http://www.ccrs.nrcan.gc.ca/linc/ps/paper/aero/indexe.html**
Canada Centre for Remote Sensing – **http://www.ccrs.nrcan.gc.ca/ccrs/homepg.pl?e**
Earthquakes – **http://www.seismo.nrcan.gc.ca/welcome.html**
Geodetic Surveys – **http://www.ccrs.nrcan.gc.ca/linc/ps/digital/geo/indexe.html**
Geophysical Data Centre – **http://gdcinfo.agg.nrcan.gc.ca/gdc/gdc0eng.html**
Geological Survey of Canada – **http://www.nrcan.gc.ca/gsc**
Geological Survey of Canada (Atlantic) – **http://agcwww.bio.ns.ca**
Geological Survey of Canada (Pacific) -
http://www.nrcan.gc.ca/ess/gscpacific/van_temp/index.htm
Geological Survey of Canada (Mineral Resources Division) -
http://www.nrcan.gc.ca/gsc/mrd/mrd_e.htm
Geological Survey of Canada (Continental Geoscience Division) -
http://gis.nrcan.gc.ca/cgd/cgdhm_e.htm
Geological Survey of Canada (Quebec) - **http://www.nrcan.gc.ca/gsc/cpdnew/gscque_e.html**
Geological Survey of Canada (Calgary) - **http://www.nrcan.gc.ca/~rose/gsccalhp.htm**
Geological Survey of Canada (Terrain Sciences Division) - **http://sts.gsc.nrcan.gc.ca/tsd.htm**
Legal Surveys – **http://www.geocan.nrcan.gc.ca:80/lsd**
Legal Surveys Division Offices – **http://www.geocan.nrcan.gc.ca:80/lsd/offic_en.html**
Magnetic Field – / north magnetic pole – **http://www.geolab.nrcan.gc.ca/geomag**
National Atlas Information Service – **http://www-nais.ccm.nrcan.gc.ca**
National Atlas on Schoolnet – **http://www-nais.ccm.nrcan.gc.ca/schoolnet/Home.html**
NATMAP – **http://www.nrcan.gc.ca/gsc/cpdnew/natmap_e.html**
Polar Continental Shelf Project – **http://www.nrcan.gc.ca/ess/pcsp/pcsp.htm**
Sherbrooke Office – **http://www.ccg.nrcan.gc.ca**
Topographical Map Service – **http://www.geocan.nrcan.gc.ca/topo/index.html**

Canadian Forestry Sector Sites:

CFS Pacific Forestry Centre – **http://www.pfc.cfs.nrcan.gc.ca**
CFS Northern Forestry Centre – **http://www.nofc.forestry.ca**
CFS Great Lakes Forestry Centre – **http://www.glfc.forestry.ca**
CFS Laurentian Forestry Centre – **http://www.cfl.forestry.ca**
CFS Atlantic Forestry Centre – **http://www.fcmr.forestry.ca**

Minerals and Metals Sector Sites:

Biominet - **http://www.nrcan.gc.ca/mets/biominet**
Canadian Certified Reference Materials Project (CCRMP) - **http://www.nrcan.gc.ca/mets/ccrmp**
Canadian Explosives Research Laboratory - **http://www.nrcan.gc.ca/mms/explosif/incerle.htm**
CANMET[1] Information Center– **http://www.es.nrcan.gc.ca/msd/cic/cicintro.htm**
Explosives Regulatory Division - **http://www.nrcan.gc.ca/mms/explosif**
Fiscal Analysis Division - **http://www.nrcan.gc.ca/mms/efab/fad**
Mine Environment Neutral Drainage (MEND) - **http://www.nrcan.gc.ca/mets/mend**
Minerals and Metals - A World to Discover - **http://www.nrcan.gc.ca/mms/school/e_mine.htm**
Minerals and Mining Statistics Division - **http://www.nrcan.gc.ca/mms/efab/mmsd**
National Mining Week - **http://www.miningweek.org**
Tax Legislation and Mineral Resources Division - **http://www.nrcan.gc.ca/mms/efab/tlmr**

Energy Sector Sites:

CANMET[1] Information Center– **http://www.es.nrcan.gc.ca/msd/cic/cicintro.htm**
Climate Change—Voluntary Challenge and Registry – **http://www.vcr-mvr.ca**
Energy Efficiency Programs – **http://eeb-dee.nrcan.gc.ca**
Natural Gas Division – **http://www.es.nrcan.gc.ca/erb/ngd/homepage/home.html**

1. Canada Centre for Mineral and Energy Technology

E. Topical Index