Department of Energy, Mines and Resources 9.2.6

The Department of Energy, Mines and Resources (EMR) promotes discovery, development, use and conservation of the country's mineral and energy resources. The earth sciences program provides the basic geodetic survey and topographical mapping of Canada. It conducts geological research and surveys to provide data on earth materials and terrain, to assess geological and terrain factors affecting use of these materials, and to develop techniques for monitoring characteristics of earth materials and terrain features. The program also conducts geophysical, seismic, gravity and magnetic studies of the earth's crust and interior, as well as research and field surveys in the area of the Arctic continental shelf. Through a centre for remote sensing the department is involved in development of facilities and techniques for production and use of data gathered by satellites and high-flying aircraft.

The program on mineral and energy resources includes research on the technology of mining, extraction, metallurgy, processing and use of metals and alloys; processing and use of fossil fuels; and minerals and mineral processing. Studies are conducted on pollution from thermal, metallurgical and mining processes and development of prevention and abatement techniques. Geological research and surveys are an important part of this program's activities, including research on the geological history of the earth, development of geological instruments and methods and surveys to describe and interpret the bedrock geology and to provide information to facilitate the discovery of mineral deposits.

Research activities in geoscience, minerals and energy technology provide the base needed for minerals and energy policy development. Research programs are directed in part to developing new techniques in exploration and resource analysis for land and offshore areas. Other research improves methods of understanding mineral and hydrocarbon occurrences, encouraging exploration and resource assessment.

One research program is directed toward a better understanding of Canadian earthquakes and seismic risk and hazard. Investigations of gravity and magnetic fields and the geothermal conditions of the earth are carried out in aid of navigation, transportation, communications, surveying and geophysical prospecting.

Some of the R&D activities bear directly on issues of environmental protection. For example, studies of permafrost not only provide information that will help in planning northern development but also provide data for assessing the environmental impact.

The geodetic framework, responsibility of a surveys and mapping branch, consists of tens of thousands of precisely located points and is essential to all other surveys and studies as well as for most large engineering projects. Multi-purpose topographic mapping is the foundation of a host of activities such as resource development, transportation, communications, urban and rural administration, education, defence and recreation.

The growing technology of sensing from satellites and aircraft is used by the remote sensing centre to provide data for such activities as ice reconnaissance, crop forecasting and forest fire prevention.

Department of National Defence 9.2.7

R&D projects for the defence department are varied and often have important applications in other areas. Many relate to defence of Canada's frontiers, especially the North, involving such problems as human and machine adaptation to extreme cold. Testing and standardization activities are conducted primarily by test and evaluation establishments of the Canadian Armed Forces.

The main responsibility for science and technology rests with a research and development branch. It is establishing a broad technology base to be maintained in six of its own research establishments across Canada, in industry and in other departments and agencies. In line with the contracting-out policy, external resources are used where practical but in many vital defence areas the technology base is maintained in-house. Outside contractors are used to provide advice on military training or operations and on human performance in the military environment. They are also used for equipment-