



Energy, Mines and
Resources Canada

Énergie, Mines et
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CANMET

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for Mineral
and Energy
Technology

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de la technologie
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et de l'énergie

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MINING RESEARCH LABORATORIES

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MINERALS AND ENERGY RESEARCH PROGRAMS
MINING RESEARCH LABORATORIES
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FOREWORD

Throughout 1975, the Mining Research Laboratories along with other units within CANMET engaged in the exercise of matching research objectives and priorities to national needs. The matching of research to governmental policy, to public demands, and to the preferences of individual scientists, is to say the least a difficult task, particularly when the national needs often follow changing and complex patterns. However in 1975 continuing and persistent cooperation and communication amongst facility managers, program managers, individual scientists, and other staff members engendered a climate of awareness of national need and required individual restraint and generated a feedback and self-critiquing system which gives some indication of linking MRL more effectively internally and externally within the CANMET matrix system.

It is not the purpose of this report to give a full account of MRL's scientific activities in 1975 but rather to touch briefly on the scope of these activities, on the multi-disciplinary nature of MRL staff, and on the highlights of achievements.

During 1975, MRL placed increased emphasis on research activities relevant to health and safety of mine workers, particularly uranium workers; specific problems associated with mining mountain coals; and the development of an overall mining research strategy. The total effort in 1975 cost approximately 2.2 million dollars and involved some 70 man years. Close to one-half of the MRL staff is located in regional units and the greater part of the Ottawa staff are assigned to highly specialized national certification units (explosives, electrical and diesel). Consequently by the very nature of the work, field research and national certification, the main expenditures were for salaries and travelling expenses. For the resources expended, MRL staff produced 119 reports; served as experts in particular fields of knowledge as committee members, lecturers, and professional advisers; and maintained a favourable position for the Laboratories within the scientific and social communities.

The Mining Research Laboratories will continue to rely heavily on the quality and calibre of its staff in 1976. Primary responsibility for developments will rest with the managers and staff of the five principal units, namely, Rock Mechanics Laboratory, Canadian Explosives Research Laboratory, Canadian Explosives Atmospheres Laboratory, Elliot Lake Laboratory and the Western Office, and with the cooperation of the project leaders of the CANMET programs and information services.



Thos. S. Cochrane,
Chief,
Mining Research Laboratories

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ROCK MECHANICS LABORATORY

G. E. Larocque
Manager

Pit Slope Office

R. Sage
Officer-in-charge

Uranium Office

A. Dubnie
Officer-in-charge

INTRODUCTION

During 1975, the Rock Mechanics Laboratory continued to participate actively in CANMET's Minerals and Energy Research Programs. A total of 40 internal and 3 external reports were prepared. In September, 1975, the Quebec Office was closed and its research activities assumed by other units of the Mining Research Laboratories.

MINERALS RESEARCH PROGRAM

1. Pit Slope Office

Contracts for the Co-operative Pit Slope Project with a total value of \$542,000 were awarded and administered during 1975 in the following task areas: groundwater, perimeter blasting, structural geology, revegetation and mechanical embankments. The four elements of the project in which Rock Mechanics Laboratory staff were directly involved were Blasting, Monitoring, Testing and Design.

Blasting. The control blasting chapter and appendices as submitted by the prime contractor at the end of the last contract period are presently being up-dated to incorporate changes required as a result of technical reviews and to include any available new material. The revised chapter is due March 31, 1976.

Monitoring. A draft chapter on monitoring was prepared which included a report on the utilization of telemetry in open pit mine surveillance as submitted by the contractor. A contract was also awarded for continued but modest financial support of test field monitoring installation at Gibraltar Mines. Field installations experienced technical difficulties and did not progress satisfactorily during 1975.

Testing. Review and evaluation of research and development data produced by the contractors during the past 3 years of the project have been completed. The chapter on testing has been partially rewritten with finalization expected by April, 1976.

Design. To support the design task group, a finite element stress analysis program incorporating a pre-and post-data process has been prepared and documented. Critical reviews of design and other chapters have been prepared by the laboratory staff.

2. Conversion of Open Pit to Underground

The cooperative project started in 1974 with Ecstall Mining Limited (Kidd Creek Mines) continued through 1975.

A series of model studies using the finite element technique were conducted and the effect of regional tectonic stresses on excavations of the mine investigated. Five 3-D FE (Finite Element) models simulating a portion of the Kidd Creek Mine were examined under gravity loading conditions. In order to determine the optimum sequence of mining a large block of ore underground, models will be constructed as more field and geological information is made available.

3. Diamond Drilling

A contract for \$40,000 covering field logging of operational parameters and assessment of results was awarded and supervised during 1975. Also, research on development of a more portable and light-weight drilling machine is continuing. This is the third year that supplementary funding has been available for diamond drilling research on a contract basis. Final report on logging study is due March 31, 1976.

ENERGY RESEARCH PROGRAM

1. Coal

In support of the field studies carried by the Western Office, a system for detecting the subsidence zone above outcrop mines is under development. As well, a FM/FM radio link is being designed and developed for utilization with the detection system and it is planned to install this in the field during the coming spring. A research proposal has been submitted for the coming year to extend this sub-project.

Also on behalf of the Western Office, RML handled the submission and carried out the modifications necessary to have several measurement instruments classed intrinsically safe.



Figure 1. Automatic Crack Monitor, Endako, August 1975

2. Uranium Office

Validation of ore reserves, assessment of productive capacity and development of methods for processing and retrieving data continued. The crash program, commenced in mid-1974, and directed towards making an initial assessment of reasonably assured reserves for the Uranium Resource Appraisal Group of EMR, was completed in January, 1975. However, because of the shortness of time many estimates had to be used.

During 1975, the Canadian uranium ore reserves were re-assessed in the light of increased world prices and escalated production costs. In addition, it was possible to place data from drill logs at one mine on computer cards. From this information inventory it is expected that ore reserves can be calculated using the computer. The program which was written for this purpose still requires some refinement and it is likely that a complete system of handling the basic ore reserve data will require time to develop.

The first report concerned with Canadian uranium reserves and productivity capacity was completed in February, 1975 and a second report

is currently being prepared. Expanded activities are anticipated for 1976-77 to meet the large price increases for U_3O_8 which are known to be occurring in the industry.

SPECIAL PROJECTS

1. Computer Support

In a continuing effort to upgrade programs used for application of finite element analysis to mine structural problems, a study was carried out into the errors involved in applying the finite element method to typical mining problems. The results of the study are reported in MRL 75-116. In anticipation of MRL movement toward the 3-D FE analysis of mine structures, a 3-D mesh-generating program for SAP3D was developed and documented. Also the 2-D finite element package was revised during 1975 and new documentation presented in a report (MRL 75-109).

2. Underground Storage of Waste Nuclear Material

In cooperation with CANMET program staff, steps were developed which will permit CANMET's participation in studies related to the use of hard rock formation for the storage of waste nuclear materials. Preliminary estimates for planned tests have been given to the EMR committee concerned with mining costs and a search is underway to find potential mine test sites. Finite element studies have been started to establish temperature and stress distribution around mine openings where hot atomic waste cannisters have been installed below floor level and a report on these analytic studies will be available by April 1976.

CANADIAN EXPLOSIVES RESEARCH LABORATORY

J. A. Darling
Manager

INTRODUCTION

Work at the Canadian Explosives Research Laboratory falls primarily under the Minerals Research Program and is chiefly concerned with testing and evaluating explosives and dangerous goods and with improving the laboratory's capability in this regard. Work is carried out with regard to the Coal Activity of the Energy Research Program. A total of 404 test results and 11 research or development reports were prepared in 1975.

MINERAL RESEARCH PROGRAM

1. Examination of Explosives, Fireworks and Dangerous Goods

Continuing its function of examining samples of explosives, fireworks and dangerous goods submitted by the Chief Inspector of Explosives, CERL issued reports on 404 samples (for advice concerning authorization under the Canada Explosives Act) during the year. These reports covered chemical analyses, function tests and determinations of levels of sensitivity to shock, mechanisms and heat. Samples submitted ranged from toy roll caps to high explosives remaining after the disastrous explosion at McMasterville on October 1, 1975.

2. Explosives Safety Engineering

Development engineering on test methods and problems associated with safety resulted in seven reports during the year. One report was concerned with the impact sensitivities of slurry explosives and their sensitizers in the type 12 tool and the hazard which may exist if these explosives are allowed to dry out. Shock sensitivity, particularly the evaluation of the shock output of fulminate chlorate caps and other shock generators, is an on-going investigation.

Investigations of impact noise levels was confined during the year to those produced by toy pistol caps. The general opinion of medical and regulatory authorities is that impact noises louder than 130 dB above standard pressures (at a distance of 45 cm) may cause hearing loss. The measurement of this sound pressure level from toy caps is difficult because each manufacturer specifies his own toy gun. Our TCTM was developed to place this regulation of impact noise levels on a scientific basis.

An exhaustive evaluation of four types of 'thunderflash' bangers from 12 gauge shotguns currently used by the Ministry of Transport to keep birds dangerous to aircraft away from aerodrome runways indicated that the quality of these products has deteriorated over the past five years. As a result of this report authorizations for the first half of 1975 were cancelled until the quality of the product was improved.

The explosion of a watergel during manufacture at McMasterville was a catastrophe partly because of the number of people killed but also because it indicated that safety engineering relative to water gels has been faulty. Investigation of samples associated with the accident established (a) that the raw materials used at the time were of good quality, (b) that the Powermex 500 was more sensitive than when tested in our laboratory apparatus, and (c) that while increase of sensitivity with temperature was a serious matter a much more serious one was the simultaneous effects of temperature and pressure which could exist in an apparatus such as a "Moyno" pump. The problem of spurious sensitivities (especially under pressure) of slurries centers around heat sensitivity. Mechanical sensitivities are now under surveillance but it is suspected that they are probably less relevant.

During 1975 a study was made of the hazard associated with the electrical conductivity of a slurry explosive. It was noted that contrary to established practice during manufacture of nitroglycerine explosives, the use of interior wiring and associated electrical motors and heaters has been permitted in slurry manufacturing plants. The investigation revealed that, in a closed system of a pressure hose containing explosive, an accidental electrical circuit through it could cause an explosion. More importantly any associated heat source there would be dangerous. This property will be more thoroughly investigated as will the new non-electric blasting system - Nonel. It has been established that two serious accidents were caused by susceptibility of the polyethylene train not directly to reservoirs of static charges but rather to indirect charging of the system from a grounded source.

In the coming year it is anticipated that continuing liaison with the development staffs of explosives companies will result in the enhancement of the safety properties of explosives generally and newer slurry explosives in particular. In 1975 informal relations were considerably developed with

the U.S.B.M. - ERL at Pittsburgh and it is hoped a more formal liaison can be established. The manager, CERL, accepted the chairmanship of the newly-formed subcommittee on blasting agents and ammonium nitrates of the International Group on Unstable Substances, Organization for Co-operation in Economic Development.



Figure 2. The remains from a flexible hose containing a water slurry which exploded on ignition. A parallel mechanism probably caused the fatal accident at McMasterville on October 1, 1975.

3. Explosion Products

Gaseous products of explosions has been the subject of a limited amount of investigation at the laboratory for a number of years. The main thrust of the work was the development of a mathematical model which was to predict not only fume products but also other explosion parameters such as explosion velocities, pressures and temperatures. A viable model for mixtures containing ammonium nitrate with no solid explosion residues was obtained. Through the courtesy of the U.S. Defence authorities, the 'Tiger' code for a mathematical model was also obtained and a limited amount of application of its relevant sections was achieved during the year.

The assessment of the effects of explosion fumes is a provincial responsibility and measurements of fume potential of explosives is carried out at CERL as a result of federal/provincial agreements. A consensus of provincial opinion is that research into noxious fumes such as nitrogen oxides and carbon monoxide is not worthy of financial support since fumes presently produced can be controlled by adequate mine ventilation. Consequently, this research is being terminated. The models already developed are expected to be useful for incorporation into one designed for sensitivity prediction in the new project "Mechanism of Initiation".

Nevertheless, new explosive compositions may be expected to produce exotic fumes because of new trace ingredients being incorporated into explosives for other purposes. Many of them may be extremely noxious and a means of general surveillance should be provided.

ENERGY RESEARCH PROGRAM

1. Coal (Spontaneous Combustion)

A cooperative research project initiated in 1973 between MRL and Kaiser Resources Limited continued in 1975. CERL undertook the study of the tendency of coal from hydraulic coal mines to spontaneous combustion and the nature of the gaseous products during early stages of spontaneous heating in the mine. A non-isothermal dynamic method to determine gaseous products from low temperature oxidation of hydraulic mine coal was developed. This development is outlined in internal report MRL 75-96. In addition, results of past studies including basic data on coal properties, mine environments and continuous monitoring systems were summarized.

A literature review and feasibility report on the methane/coal dust explosion in underground coal mines was written.

ELLIOT LAKE LABORATORY

G. Zahary
Manager

INTRODUCTION

Research at Elliot Lake Laboratory is carried out under the mining Activity of the Minerals Research Program. In 1975 fifty research reports were prepared, of which 37 were internal publications, 5 were presentations and 5 were substantial contributions to the Pit Slope Manual.

MINERALS RESEARCH PROGRAM

1. Waste Disposal

During 1975 a comprehensive project of research on disposal of uranium tailings was established. Water seepage problems were reviewed. A small analytical laboratory was built and studies started in the laboratory and field. Microbiological research was added late in the year and is still in the review and facility development stages. Reclamation studies continued. Field plots from previous years have been maintained and vegetation growth documented. The informal industry-government-academic seminar on reclamation of sulphide wastes was also revived. Well defined plans have been made to continue this work during the coming year.

2. Environment

Some internal adjustments were required in the environmental project to meet the demands of rapid changes in attitude to occupational health problems in the mineral extraction industry, especially the uranium industry. During the year, gravimetric sampling and X-ray diffraction were accepted as practical alternatives to konimeter and number counts for respirable dust sampling and evaluation. Field studies of dust sources in mines and further development of sampling/analytical procedures for dust including preparation of manuals, are now underway. A research contract on continuous monitoring of the underground environment was established. A technical seminar on state-of-the-art in radon/radon daughter measurements was held and was well attended (45). A comprehensive field project in noise measurement was organized. On-going work consisted of performance studies of noise dosimeters, development of a noise monitor hat, and an examination of the attenuation characteristics of 10 ear muffs.

3. Mining Equipment

This project terminated because of loss of staff, closure of the Quebec laboratory and the attainment of research milestones. However, the two principal areas of research, underground communications and operational control systems, too fundamental to be abandoned, will be redefined in a different context in future work.

During 1975 water flow and motor current controllers for a raise boring machine were developed to a point that they could be used on production equipment. Four borehole locaters for industrial customers were built and the usefulness of the unit established. The design details are available to interested manufacturers and an operating manual has been prepared. Developments in radio communications for underground mines were reviewed and a seminar on communications technology held in conjunction with the Canadian Mining and Aggregate Equipment Exhibition.

4. Underground Mining Methods

With a broadening interest in mining method research there is a need for a research strategy. In the past year two state-of-the-art reviews were prepared, one on mining methods and another on rock mechanics applications.

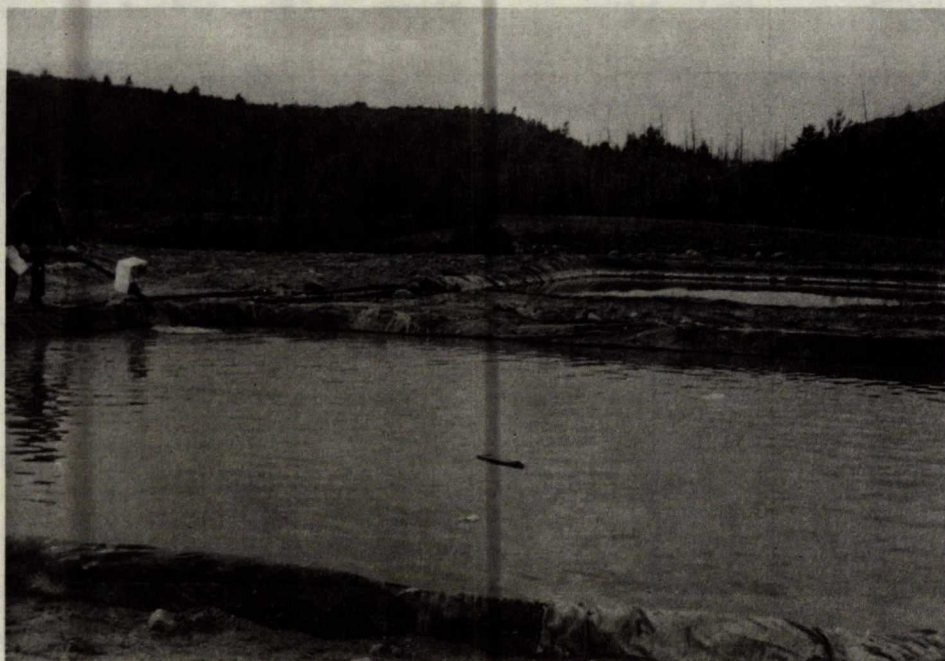


Figure 3. Test Pits with Full Load of Slurry

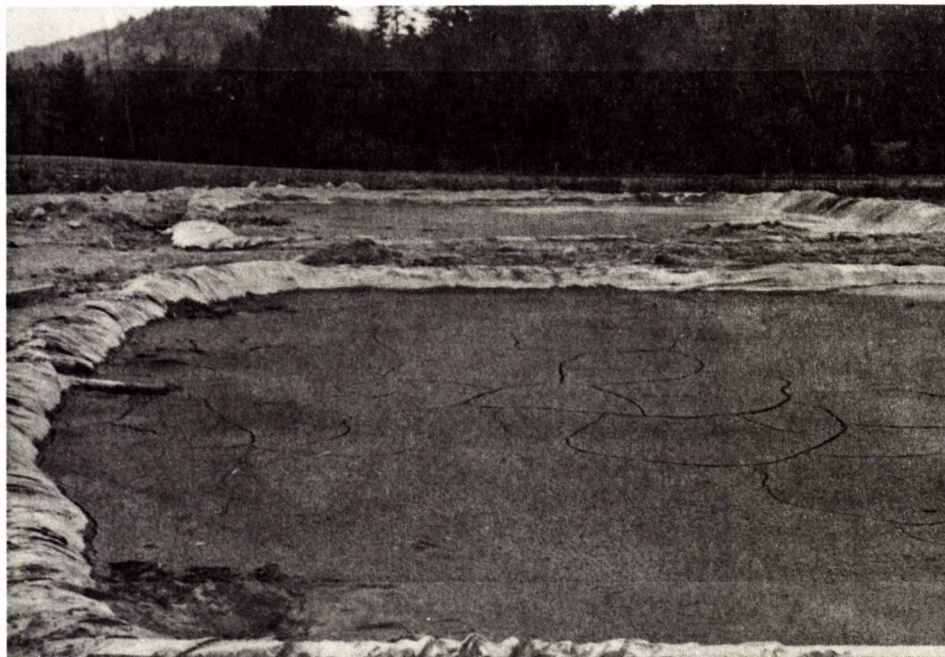


Figure 4. Completed, Filled Test Pits, November 1975

Stress measurements continued on a cooperative basis with the Federal Geological Survey of West Germany as well as with Canadian mining companies. Instrumentation to measure in situ seepage velocity in backfill was developed and arrangements made to test it underground. A meeting of the Subcommittee on Fill, CNCRM, was held in Timmins. The Sub-committee agreed to summarize its accomplishments in a final report and if practical organize an international conference.

5. Open Pit Mining

In October 1977, the executive summary of the Pit Slope Manual is to be published and the main contribution of the Laboratories to this project will then be completed. During 1975 preparation and review of the Structural Chapter and a number of supplements/appendices, were carried out and they are in various stages of completion. In the laboratory, investigations were conducted into shear strength of geological fractures and strength of material bridges. Field monitoring of slope stability continued using the laser theodolite and photogrammetry.

A supplement on the mine waste inventory along with other unspecified supplementary publications are in preparation to be completed in 1976. Also technical seminars are planned for the coming year.

WESTERN OFFICE (CALGARY)

**K. Barron
Manager**

INTRODUCTION

Research at the Western Office is confined to the Supply Activity of the Energy Research Program and is split into three CANMET Projects: Resource and Reserve Assessment (Coal Mineability), Coal Mining Technology (Ground Control) and Coal Mining Technology (Environmental Control). A total of 17 reports were prepared in 1975.

ENERGY RESEARCH PROGRAM1. Resource and Reserve Assessment (Coal Mineability)

Saskatchewan Lignites: A system for the computer selection of draglines, capital and operating costs for Saskatchewan conditions has been developed and is operating. Work is underway on developing a similar selecting and costing system for coal removal and transportation. Criteria for selection of the optimum mining areas to be considered are being developed and the first preliminary computer maps have been produced showing contours of coal thickness, strip ratios and a mining exploitation index to identify the optimum mining areas.

Underground Mining Methods: A two-man CANMET team visited Germany to document the German technological developments in underground hydraulic mining and hydromechanical hoisting and considerable technical and cost data was gathered.

Alberta Cooperative Experiment: No progress was made in this area during 1975. The provincial-federal referee committee selected a proposal for support. The mining company involved was prepared to start the field trial. However, environmental and financial problems postponed the study until 1976.

2. Coal Mining Technology (Ground Control)

McIntyre Mines - Pillar Stability: Data gathered previously from #2 mine is being analysed but this is proving difficult due to the unsystematic mining carried out. An air injection technique for assessing pillar integrity has been developed and the initial results appear promising.

McIntyre Mines - Subsidence: Additional instrumentation was installed at the beginning of the year; all instruments were monitored

through 1975. Significant interaction between the retreat mining in #2 mine and #11 seam has been recorded and a clear picture of "cause and effect" is emerging which has allowed predictions of ground movements to be made. As a result, some modifications in the mining plans have been made by the company to prevent excessive ground movement in critical areas.

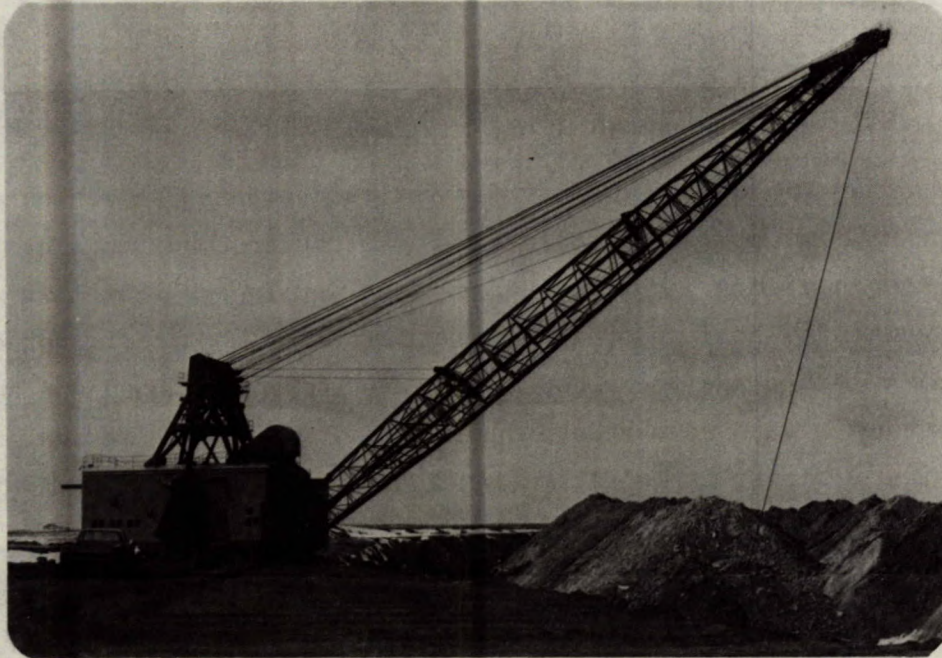


Figure 5. Recoverable Lignite Reserves and Recovery Costs Using Draglines are Assessed as Part of the Saskatchewan Lignite Reserves Assessment Project

Kaiser Resources, Hydraulic Mining: Instrumentation was developed and one major underground monitoring station (plus sub stations) was installed and monitored during the year. Progress to date has been reported, but additional data must be gathered during 1976 before preliminary findings can be verified.

Kaiser Resources, Subsidence: During the summer field studies of the lithology and structure in the mining area were completed. Some data has been gathered from survey lines despite the inability to survey during

winter, and general observations on the surface subsidence over the mining panels were reported.

Mine Design Documentation: Old mine plans are being examined, and common features are being documented together with changes from normal procedures. Progress has been slower than envisaged due to difficulties in tying down the causes for changes in mining practice.

Roof Support: Service work on testing of both conventional and grouted bolts, as requested by mining companies, continued. Innovative procedures were delayed due to difficulties in obtaining suitable sites, but work on the use of cable anchors commenced shortly before the year end.

Outburst Studies: A report on previous years work was completed.

3. Coal Mining Technology (Environmental Control)

Spontaneous Combustion (Laboratory): Western Office staff is only involved in providing samples for this Ottawa-based task.

Spontaneous Combustion (Field): Work is in progress on getting CO monitoring system functional before field installation. As a result of delays due to manufacturer's inability to meet specifications and malfunctioning of equipment, this aspect of the project is at least nine months behind schedule.

INFORMATION OFFICE

A.L. Job
Information Officer

INFORMATION OFFICE

1. Information

An Information Officer was appointed in 1975 to each of the CANMET Laboratories. A continuing review of data from Statistics Canada and other sources, relating to mining technology, has been maintained. Advice was given in reply to numerous requests and enquiries were answered on such subjects as training inspectors for uranium mine operations, use of old lubricating oil in ANFO, costs of emplacing heaters underground (re radio-active waste disposal), hydraulic power in mining equipment, information on very dry mines in Canada, dust collection in coal mines, mining of coal under the sea and under bodies of water.

To provide information services within MRL, files are maintained on: general mining, mine accidents, undersea mining and dredging, coal mining, Canadian coal mine development and application, hydraulic coal mining, diamond drilling, subsidence, hydraulic fill, noise, lighting in mines, pipelining of slurries and mining associations.

2. Publications

During 1975 a Laboratories Editor was appointed and all reports for publication in outside journals and for CANMET publication are now edited within MRL. The following number of reports were dealt with by the publications group in 1975:

CANMET Publications	3
Journal Publications	20
Internal Reports	98

The publications activity in MRL is part of the CANMET publications service through which results of research are made available generally within the Department, to the Canadian mining industry and to the general public. To provide this service an efficient system for recording, reproducing, storing and circulating all MRL reports is maintained.

ADMINISTRATION, MINING RESEARCH LABORATORIES

E.C. Tupper
Administrative Officer

INTRODUCTION

This section of the report is a statistical summary of the research activities of the Mining Research Laboratories for the year 1975. Complete lists are given of external publications and papers presented. Lists are also provided of internal reports, committee and conference work carried out by MRL personnel and staff changes that occurred during 1975. An attached appendix lists contacts with government departments and industry; and field and work visits during 1975.

EXTERNAL PUBLICATIONS

- "Experiences in Simulating Rock Slopes by the Finite Element Method" Y.S.Yu and D.F.Coates; submitted as a Memoir to the Geological Society of America Inc., 3300 Penrose Place, Boulder, Colorado, 80301, U.S.A.
- "Noise Attenuation in Rock Drills" M.Savich and J.Wylie; Canadian Mining Journal, 39-44, 66, October 1975.
- "Methane Pressure and Flow Measurements in Coal and Surrounding Strata" M.Y. Fisekci and K.Barron; CIM Bulletin, October 1975, vol. 68, No. 762.
- "Some Recent Applications of Radio Communication in Underground Mines" M.D. Everell and R.Tervo; CIM Bulletin, pp 55-61, April 1975.
- "Instrumentation and Data Logging on a Raise Boring Machine" M.D.Everell, R. Tervo and G.Turcotte; CIM Bulletin, pp 79-89, July 1975.
- "Rock Mechanics Applications in Canadian Underground Mines" D.G.F.Hedley and J.C.Wilson; CIM Bulletin, pp 61-73, November 1975.
- "Strength of Mine Pillars from Laboratory Tests" G.Herget and K.Unrug; submitted to CIM Bulletin, June 1974.
- "Ground Stability Problems - To What Extent are They Responsible for Accidents in Underground Mines?" A.L.Job and M.D.Everell; Proceedings, 10th Canadian Rock Mechanics Symposium, Queen's University, Vol. 1, pp 55-68, 1975.
- "Ground Stresses Below 3000 Feet" G.Herget, A.Pahl and P.Oliver; Proceedings, 10th Canadian Rock Mechanics Symposium, Queen's University, Vol. 1, pp 281-307, 1975.
- "Finite Element Method and Mining Engineering" Y.S.Yu and N.A.Toews; Northern Miner Annual Review Number, pp 14-15 C Nov. 27, 1975.
- "Pit Slope Design" R.Sage; Northern Miner Annual Review Number; pp 14-15 Nov. 27, 1975.
- "Gravimetric Dust Sampling with Quartz Analysis and Its Use in Metal and Mineral Mines" T.S.Cochrane and G.Knight; Proceedings International Mine Ventilation Congress, Johannesburg, South Africe, September 1975.
- "Thrust Faults - A Problem in Western Canadian Coal Mines" H.U.Bielenstein; submitted to CIM Bulletin.
- "Rock Mechanics and Ground Control" D.G.F.Hedley and G.Herget; published by United Nations, New York, 1975, Catalogue No. DP/UN/INT-72-064, Paper No. IV, pp 89-129.
- "Effect of Geological Factors on Stope and Pillar Layout in an Elliot Lake Uranium Mine" by D.G.F.Hedley. Published in the CIM Bulletin, March 1975.

"Overlap Problems in Counting Fibres" by G.Knight. AIHA Journal, Vol 26, No 2, pp 113-114, February 1975.

"Some Recent Applications of Radio Communications in Underground Mines", R.Tervo and M.D.Everell. CIM Bulletin, Vol 68, No 756, pp 55-61, April 1975.

"Grinding of Preheated Rocks", R.Tervo and L.Geller. Transactions, Section C, the Institute of Mining and Metallurgy, Vol 84, 1975.

"Alternative Room-and-Pillar Patterns Proposed for Bigger, Safer Ore Take" G.Zahary. Engineering/Mining Journal, pp 112-116, August 1975.

"Effect of Geological Factors on Stope and Pillar Layout in an Elliot Lake Uranium Mine", D.G.F.Hedley, CIM Bulletin, Vol 68, No. 755, pp 107-112, March 1975.

"Bibliography of Hydraulic Coal Mining", A.L.Job, Investigation Report, MRL.

"Heat Generation and Dust Explosions in the Mining of Sulphide Ores - A Literature Survey", A.L.Job, Investigation Report, MRL.

"Mining Technology in 1973", Amil Dubnie, Investigation Report, MRL.

PAPERS PRESENTED

- "Underground Communication Methods", R.Tervo and M.D.Everell; presented to the Quebec Mining and Metallurgical Association, Feb. 20, 1975, Montreal
- "Noise Attenuation in Rock Drills", M.Savich and J.Wylie; presented at 44th Ann. Mtg., Mines Accident Prevention Association of Ontario, May 23, 1975, Toronto
- "Brief to the Royal Commission on the Health and Safety of Workers in Mines in Ontario", Staff CANMET, presented to the Royal Commission in Toronto, Ontario, May 26-30, 1975
- "Methane Pressure and Flow Measurements in Coal and Surrounding Strata", M.Y. Fisekci and K.Barron; presented at Ann. Gen. Mtg., CIM, Toronto, May 7, 1975
- "Rock Mechanics Applications in Canadian Underground Mines", D.G.F.Hedley and J.C.Wilson, presented at the Annual General Meeting, CIM, Toronto, May 4-7, 1975
- "Ground Stability Problems - To What Extent are They Responsible for Accidents in Underground Mines?", A.L.Job and M.D.Everell; presented at 10th Canadian Rock Mechanics Symposium, Kingston, Sept. 1, 1975
- "Ground Stresses Below 3000 Feet", G.Herget, A.Pahl and P.Oliver, presented at 10th Canadian Rock Mechanics Symposium, Kingston, Sept. 1975.
- "Thrust Faults - A Problem in Western Canadian Coal Mines", H.U.Bielenstein, presented at the Western Annual CIM Meeting, Edmonton, Alberta, Oct 26-29, 1975
- "Rock Mechanics and Ground Control", D.G.F.Hedley and G.Herget; presented to United Nations Inter-Regional Seminar on Advanced Mining Technology, 21 May to 3 June 1973, Ottawa.
- "Characteristics of the Personal Noise Dose Meter Type 4425 as Exemplified by Serial No. 453311, presented to the Elliot Lake Ventilation Group, Jan. 1975
- "Risk Analysis Applied to Flameproofing of Diesel Exhaust Systems - Preliminary Phase", P.Mogan, W.M.Gray and D.B.Stewart; presented at the 16th International Conference on Coal Mine Safety Research, Washington, D.C., September 1975.

INTERNAL REPORTS

The internal reports (MR series) listed below are restricted for government use, and only available to research groups engaged in similar fields, by applying to the Chief, Mining Research Laboratories.

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
74/146	Annual Report of the Western Office Mining Research Centre, 1974.	K. Barron
74/147	A Research Proposal for Development of Computer Aided Design Techniques for Underground Mining Canada.	R. Sage
74/148	Explosives Service Samples Calendar Year 1974.	J.A. Darling
74/149	Annual Report 1974, Service Budget 1974-75 Canadian Explosive Research Laboratory.	J.A. Darling
74/150	Preliminary Noise Survey at a Mine-Smelter Complex.	M. Savich G. Zahary C. Fontaine
74/151	Preliminary Assessment of Canadian Uranium Reserves and Thorium Resources 1974 by the Sub-Committee on Uranium Reserves Uranium Resource Appraisal Group. (<u>Confidential</u>)	A. Dubnie
75/1 (TR)	Taylor Finite Element Mesh Generator for SAP3D.	R. Granz
75/2 (TR)	Land-Use by the Canadian Mining Industry.	A. L. Job
75/3	Direct Shear Tests on Geological Fractures and Sawcut Samples from an Open Pit Mine in Northern Manitoba. DS 75/3 (ADM) filed here also. See 75-30 19-6-75.	P. Miles G. Herget
75/4	Track Etch Detector Method for Measurement of Radon 222 Concentration in Air by K. Mamont-Ciesla, A. Wasilewski Translated by the Department of the Secretary of State.	R. Washington

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/5	National Minerals Research Program MRL Coordination Report 1975.	D. G. F. Hedley
75/6	Performance Analysis on Noise Dosimeters and Noise Exposure Monitors.	M. Savich
75/7	Procedure Manual-X-Ray Diffraction Analysis of Mine Dust.	T. Lee G. Knight W. Stefanich
75/8 (J)	Experiences in Simulating Rock Slopes by the Finite Element Method. (Geological Soc. of Amer. Memoir)	Y. S. Yu D. F. Coates
75/9	Underground Communication Methods OP Quebec Met Min. Assoc. Montreal Feb. 20, 1975.	R. Tervo M. D. Everell
75/10	Annual Reveiw of the Mining Research Laboratories, 1974. (See 75-26)	T. S. Cochrane
75/11	Assessment of Canadian Uranium Reserves and Thorium Resources. (<u>Confidential</u>)	A. Dubnie H. W. Little
75/12	Grouted Resin Roof Bolt Investigation No. 4B Mine, Canmore, Alberta.	F. Grant
75/13	Cost Analysis of Raise Boring, and Possibilities of Cost Reduction Through Control of Operating Variables.	R. Tervo
75/14	Approved Projects 1975-76, Underground Energy Development Program-Supply-Coal.	H. U. Bielenstein
75/15	National Mine Environment Institute (Dust Institute).	T. S. Cochrane
75/16	Mechanical Properties of a Gaspé Rock.	G. Zahary H. Lee
75/17	Detailed Studies on the Assessment of Quartz by X-Ray Diffraction in Airborne Dust Samples and Their Collection in Hard Rock Mines.	G. Knight

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/18	Bibliography of Hydraulic Coal Mining.	L. Job
75/19	Draft Appendix on Rock Bolt and Cable Dynamometers.	G. E. Larocque
75/20	A New Non-Electric Blasting System - Nonel	E. Contestabile
75/21	Evaluation of the Applicability of Some Methods for the Measurement of the Short-Lived Decay Products of Rn^{222} by Means of a New X-Spectromic Extrapolation Method (Translated by Dept. of Secretary of State).	U. Zumov, I. L. Gumnerova et a
75/22	Stress Determinations in the Sudbury Area Part I: Doorstopper and Triaxial Strain Cell Tests.	G. Herget
75/23	Characteristics of the Personal Noise Dose M��ter, Type 4425.	M. Savich
75/24	First Annual CIM Underground Operators Conference.	P. Miles
75/25	Draft Appendix on Surface Strain Extensometers.	G. E. Larocque F. Kapeller
75/26	Annual Report, 1974.	G. E. Larocque
75/27	An Evaluation of Four Types of Twelve Gauge Bird Scaring Cartridges.	J. A. Darling P. Larsen
75/28	Design and Evaluation of a Toy Cap Testing Mechanism (TSTM).	R. R. Vandebeek C. A. Vary
75/29	Laboratory Classification & Characterization Tests of Rock Substance (to be published as part of the Pit Slope Manual).	M. Gyenge
75/30	Brief to the Royal Commission on the Health and Safety of Workers in Mines in Ontario. Filed with 75-3; DS75-3 (ADM) 19. 6. 75 L. C.	T. S. Cochrane
75/31	The CAMPEDS Mark II Dust Sampler Manual (Draft).	G. Knight

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/32	Methane Pressure and Flow Measurements in Coal and Surrounding Strata. AGM CIM May 7, 1975 Toronto. Publ. Oct. 1975 91-98 Vol. 68 No. 762.	M. Y. Fisekci K. Barron
75/33	Evaluation of Experimental Measurements of Ground Level Concentration of Rn and ThB in Prague during the Year 1970. (Translated by MSD TB Department of the Secretary of State).	H. Kolar ova
75/34	Documentation of a Plot Program.	H. D. Morrison
75/35	Heat Generation and Dust Explosions in the Mining of Sulphide Ores-A Literature Survey.	A. L. Job
75/36	Evaluation of Detonators in a Sand Bomb.	R. R. Vandebek W. D. Maddick B. E. Hendrick
75/37	Information for Potential Contractors for Research on Continuous Monitoring of the Underground Mine Environment.	R. Tervo R. A. Washington
75/38	A Proposed Fill Research Program for the Canadian Mining Industry.	E. G. Thomas
75/39	Noise Attenuation in Rock Drills. Published CMJ Oct. 1975, 39-44, 66 Vol. 96 No. 10. (op) MAPAO May 2-3, 1975, Toronto.	J. Wylie M. Savich
75/40	Strength of Mine Pillars from Laboratory Tests.	G. Herget & Unrug
75/41	A Preliminary Survey of the Conditions of Genesis of Radon in the Ground Water in Peking Adjacent Regions. (Translated by MSD TB DS of S.	Chen yi jian Peng Gui Gao Zhen- Luan et al.
75/42	Draft Appendix on Displacement Monitoring with Theodolites and Electronic Displacement Measuring Units (EDM).	G. E. Larocque

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/43	"Automatic Control of a Laboratory Diamond Drill with a Mine-Computer. Progress Report".	M. D. Everell
75/44	(LS) Relevé Bibliographique Sur le Control des Operations.	G. Moisan
75/45	Advisory Service in Mine Development, Provided to Chromasco Corporation.	M. Gyenge
75/46	Uniaxial Compressive Strength Form Point Loadtests.	P. Miles G. Herget
75/47	Minutes of the Twentieth Meeting of the Canadian National Committee on the Mechanics(formerly Canadian Advisory Committee on Rock Mechanics).	D.G.F. Hedley
75/48	Collection Characteristics of the Two-Stage Respirable Size Selector (CAMPEDS Mark 2).	B. Stewart
75/49 (OP)	Rock Mechanics Applications in Canadian Mines (Presented to CIM Toronto May 7, 1975) CIM 61-73 Nov. 1975, Vol. 68 No. 763.	D.G.F. Hedley C. Wilson
75/50	Interim Activity Report - Jan. 1, 1975 March 31, 1975 - Activity ES3 (Energy Research Program, Supply Project, Coal Mining Technology (Ground Control Activity).	K. Barron
75/51	Critical Review of the Design Chapter written by D.F. Coates for the Pit Slope Manual.	M. Gyenge
75/52	Appendex A to the Supplement on Laboratory Tests for Design Parameter Determination.	M. Gyenge
75/53 (OP)	Ground Stability Problems--To What Extent are they Responsible for Accidents in Underground Mines?	A. L. Job M. D. Everell

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/54	Effect of Blasting on Rock Fissuration.	V. De Kormpay G. Zahary
75/55	Automatic Graph Plotting and Magnetic Tape Storage of Field Data Using the Wang for Desk T of Programmable Calculator.	D.B. Livesay
75/56 (J)	Groundstresses below 3000 feet (Presented to 10th Can. Rock Mech. Symp. Queen's University Sept. 24, 1975 and Published in Proceedings).	G. Herget A. Pahl P. Oliver
75/57 (LS)	The Measuring of Radioactive Aerosols (Translated by MSD Dept. of Secretary of State from German into English) Visit Memoranda:	H. Gebauer Karlsruhe
75/58 (C)	The American Industrial Hygiene Conference Minneapolis, June 1-6, 1975.	G. Knight
75/59 (IR)	Properties of Slurry Explosives and Their Sensitizers Part I: Effect of Drying Slurries on Impact Sensitivities.	R.R. Vandebeek D. Dinel
75/60 (C)	Mines Accident Prevention Association of Ontario 44th Annual General Meeting and Technical Sessions, Toronto May 21-23, 1975.	M. Savich
75/61 (TR)	Determination of the In-situ Seepage Velocity of Deposited Backfill by the Electrical Resistivity Method.	V. de Korompay
75/62 (TR)	Case History of Monitoring at Ecstall Mine by	G.E. Larocque
75/63 (TR)	Pit Slope Stability Year 4, Minutes of Selection Committee. (<u>Confidential</u>).	M. Service
75/64 (R)	Mining Technology in 1973 (Not a CANMET Report 6.11.75 Mrs. Dawson).	A. Dubnie
75/65 (TR)	Draft Appendix on Moveable Borehole Inclinometers.	G. Larocque

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/66 (C)	Noisepox Conference April 30 - May 2, 1975.	M. Savich
75/67	Pit Slope Stability Project - General Information.	R. Sage
75/68	Introduction a l'information et au PDP-8/E par	J. M. Ducros
75/69	Case History of Telemetry System Trials	J. O'Shea G. Larocque
75/70	Report on Debriefing Session for B-Level Pit Slope Stability Project - Revegetation Contracts Year 1.	Dave Murray
75/71 (OP)	Simple Method of Evaluation of the Noise Exposure Index and the Equivalent Continuous Sound Level by M. Savich (for Presentation to Nat. Noise and Vibration Control Conf. and Exhibition March 29-31, 1976 New York City.	M. Savich
75/72 (TR)	Interim Activity Report - April 1st 1975 - June 30th 1975 - A Activity ES-3 (Energy Research Program, Supply Project Coal Mining Tehcnology) (Ground Control Activity).	K. Barron
75/73	A Study of Radon Daughter Concentrations Near a Pilot Scale Uranium Ore Leaching Process by	R. Washington
75/74 (TR)	Critical Review of the "Structural" Chapter (Phase I), Written for the Pit Slope Manual (by G. Herget). (<u>Confidential</u>)	M. Gyenge
75/75	Tests of the Laboratory Breakage Test on an Ore Which Showed a Marked Reduction in Quartz Content in the Airborne Dust.	G. Knight.
75/76	Correlation and Cyclicity Analysis of the Jurassic-Cretaceous Kootenay Formation Near Canmore Alberta.	J. D. Hughes H. U. Bielenstein

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/77	General Review of Underground Coal Mining and Research, 1974 and Canadian Coal Industry Statistics.	A. L. Job
75/78	Error Analysis of Gravimetric and X-ray Diffraction Assessment of Respirable Dust.	B. Kirk
75/79	Solid State Triggering Circuit for Ion Gaps in Explosive Testing.	F. Kapeller
75/80	Underground Mining Methods in Canada.	D. G. F. Hedley
75/81	Drilling Fluids Controller - Progress Report	G. Fortier
75/82	A Recommended Telemetry System for Open Pit Mine, Mine Surveillance.	J. O'Shea G. Larocque
75/83	Laboratory Tests for Design Parameter Determination.	M. Gyenge
75/84	Subsidence Studies during Working of a Steeply Dipping Coal Seam - Preliminary Report.	M. Y. Fisekci
75/85	Commande Automatique d'une foreuse de laboratoire par mini-ordinateur.	D. Cote
75/86	An Air Injection Technique for Investigating the Integrity of Pillars and Ribs in Coal Mines.	K. Barron
75/87	Dimension of a Mining Block for a Particular Relative Precision with Respect to the Metal Tonnage.	R. Sabourin
75/88	Finite Element Method and Mining Engineering (Prepared for Publication in Northern Miner) Annual Review Number Vol. 61 No. 37 Pps 14-5C Nov. 27, 1975.	Y. S. Yu N. A. Toews
75/89	Documentation of GEN3D (A 3-D Mesh Generating Program For SAP3D).	N. Toews Y. S. Tu R. Granz

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/90	Visit to the Kidd Creek Mine, Texasgulf Canada Ltd., 26th-28th August 1975.	G. D. Just
75/91	Determination of the Hazen-Williams Roughness Coefficient for Slurry Transportation Boreholes.	V. de Korompay
75/92	Dust Survey at a Second Highly Mechanized Open Stopping Operation.	G. Knight
75/93	The Lower Limit of the Coulter Size Analyzer.	G. Knight B. Stewart
75/94	Interim Activity Report - July 1st 1975 - September 30th 1975 (Energy Research Program, Supply Project, Coal Mining Technology - Ground Control Activity).	K. Barron
75/95	Pit Slope Design (To be Submitted to Northern Miner) Annual Review No. Nov. 27, 1975 p. 14-5).	R. Sage
75/96	Study on the Nature of Gaseous Products During Low Temperature Oxidation of Coal from Panel 5A Area Kaiser Resources Limited.	K.K. Feng L.C. Richards
75/97	Visit Memoranda: International Mine Ventilation Congress Johannesburg, South Africa - Fourth International Symposium on Inhaled Particles and Vapours, Edinburgh, Scotland.	G. Knight
75/98	Comparison Between Airborne Dusts from Curshing Operations.	G. Knight
75/99	Mining Research at the Kidd Creek Mine, Timmins Part 4; The Effect of Residual Tectonic Stresses on Stability of the Excavations.	Y.S. Yu
75/100	Pit Slop Project 1972-77 Pit Slope Manual Chapter 8 - Monitoring Draft (Phase I) For Review Purposes Only (Not for General Circulation) August 1975.	Edited by G.E. Larocque

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/101	Thrust Faults - A Problem in Western Canadian Coal Mines (Presentation at Annual Western Meeting CIM Edmonton October 26-29 1975.	H. U. Bielenstein
75/102 (C)	Problems in Applying Probability and Statistics to Soil and Structural Engineering - Conference Report, Aachen,, West Germany, 1975.	G. Herget
75/103 (TR)	A Hazard Associated with the Property of Conductivity of a Slurry Explosive. (Confidential)	L. J. Kaplan E. Contestabile J. A. Darling
75/104 (LS)	Development and Use of a Spark Counter for Fast Evaluation of Solid State Track Detectors (For Translation).	H. G. Paretzke Bonn, Germany
75/105 (TR)	Interlaboratory Comparisons of Quartz Analysis on Field Samples.	G. Knight
75/106 (TR)	Displacement Monitoring with Levels. (Confidential)	G. Larocque
75/107 (TR)	Uranium Program Co-ordination Report 1976. (Confidential).	A. Dubnie
75/108 (TR)	Summary of the Course Offered by the Franklin Institute Research Laboratories on Pyrotechnics and Explosives.	E. Contestabile
75/109 (TR)	SAP2D Documentation (1975 version) - 2-D Linear Elastic Finite Element Computer System. (Confidential)	N. A. Toews Y. S. Yu
75/110 (TR)	Application of Infra-red Thermometry in Early Detection of Spontaneous Heating in Coal Mines. (Confidential)	R. N. Chakravorty R. Woolf
75/111 (TR)	Energy Research Program - Supply Project, Activity Proposals 1976/77 Proposed Work for Activity ES2 Coal Mineability, and for Activity ES3 Coal Mining Ground Control.	K. Barron J. Tomica

<u>IR MR</u>	<u>Title</u>	<u>Author(s)</u>
75/112 (TR)	National Mine Environment Institute (Uranium Mines). (<u>Confidential</u>)	T.S. Cochrane G. Zahary W.M. Gray
75/113 (TR)	Spontaneous Combustion Problems in a Hydraulic Coal Mine - Kaiser Resources Limited. (<u>Confidential</u>)	K.K. Feng R.N. Chakravorty
75/114 (TR)	A Microbiological Approach to the Acidic Mine Tailings Problem. (<u>Confidential</u>)	R.G.L. McCready
75/115 (TR)	Literature Review and Feasibility Report on Methane Coal Dust Explosion. (<u>Confidential</u>)	K.K. Feng
75/116 (TR)	Stress and Displacement Errors Introduced by Truncating Large Massive Structures Part I - Cylindrical Opening Under Uniform Loading. (<u>Confidential</u>)	N.A. Toews Y.S. Yu
75/117 (TR)	A Preliminary Examination of 3-D Finite Element Modelling Applied to Mine Structures. (<u>Confidential</u>)	Y.S. Yu N.A. Toews
75/118 (TR)	Roof Bolt Tension Tests No 2A Mine McIntyre. (<u>Confidential</u>)	F. Grant
75/119 (TR)	Assessment of Tailings Disposal and Effluent Control Systems of Eldorado Nuclear's Beaverlodge Operation October 1975. (<u>Confidential</u>)	D. Moffett

MINING RESEARCH LABORATORIES
REPRESENTATIVES ON TECHNICAL COMMITTEES (1975)

INTERNATIONAL

INTERNATIONAL SOCIETY FOR ROCK MECHANICS (ISRM)

- Commission on Terminology, Symbols and
Graphic Representation (member)-----W. M. Gray
- Commission Translations and Publications
(member)----- G. Herget
- Commission on Standarization of Laboratory
and Field Tests (members)-----G. Herget/M. Gyenge
- Subcommittee for the Standarization of Field
Tests and Geophysical Logging, Category 1
(11) and 11 (12), Seismic Testing and
Geophysical Logging (member)----- G. Larocque
- 3rd International Congress: Subcommittee for
Selection of Papers (member)----- K. Barron

6th INTERNATIONAL STRATA CONTROL CONFERENCE (1977)

- International Organizing Committee (chairman)-----T. S. Cochrane
- Canadian Executive Committee (chairman)-----T. S. Cochrane
(member)----- K. Barron
- Canadian Executive Committee: Subcommittee
on Papers (chairman)-----K. Barron

ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)

- International Group of Experts on Unstable Substances
(IGUS) (member)----- J. A. Darling

THE INSTITUTE OF MINES, YUGOSLAVIA

- Sigurnost u Rudnicima (Safety in Mines)
(member of editorial board)----- M. Savich

THIRD SYMPOSIUM ON ENGINEERING APPLICATIONS OF SOLID MECHANICS

- Selection Committee for Papers
(member)----- G. Herget

UNITED STATES OF AMERICAAMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL
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Joint Aerosol Technology Committee: Subcommittee
1 and 2 (member)----- G. Knight

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Committee D-18, Soils and Rocks for Engineering Purposes,
Subcommittee 12, Rock Mechanics (members)-----W. M. Gray, M. Gyenge

U.S. DEPARTMENT OF TRANSPORT, NATIONAL TRANSPORTATION
SAFETY BOARD

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Group (member)----- J. A. Darling

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(alternate)-----T. S. Cochrane/G. Zahary

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Uranium Resources Appraisal Group: Subcommittee on
Uranium Reserves (chairman)-----A. Dubnie

Coal Committee (member)-----T. S. Cochrane

Committee on Radioactive Waste Containment----- G. Larocque

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(alternate member)-----T. S. Cochrane

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Programme (member)----- D. Hedley

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Editorial and Publications Committee
(representative)-----A. L. Job

MINISTRY OF TRANSPORT (MOT)

Technical Committee on Dangerous
Goods (member)-----J. A. Darling

Subcommittee Advisory to the Canadian Delegate to the
International Maritime Consultative Organization
(IMCO) (member)-----J. A. Darling

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Committee on Aviation Security: Subcommittee on Explosives
Tagging (chairman)-----R. Vandebeek

Committee on Aviation Security: Subcommittee on Security
Equipment (member)-----R. Vandebeek

Committee on Aviation Security: Technical Subcommittee on
Explosive Tagging, U.S. Department of the Treasury
(Canadian Liaison member)-----R. Vandebeek

NRC/CACP Technical Liaison Committee on Police Equipment:
Subcommittee, Section (2), Chemicals (member)----J. A. Darling

CANADA - MISCELLANEOUS

CAMBRIAN COLLEGE OF APPLIED ARTS AND TECHNOLOGY, SUDBURY, ONTARIO

Advisory Committee on Mining - Geology (member)-----G. Zahary

Canadian Geotechnical Society, Ottawa Geotechnical Group
Programme Committee (member)-----W. M. Gray

CANADIAN INSTITUTE OF MINING AND METALLURGY (CIM)

Algoma Branch (member)-----D. Hedley
(chairman)-----G. Zahary

Calgary Branch (2nd vice-president)-----K. Barron

Computer Applications and Process Control Committee
(representative for Coal Division)-----K. Feng

Coal Division (1st vice-chairman and member of
executive)-----T. S. Cochrane
(member)-----K. Feng

Committee on Divisional Programs

(member of executive)-----T. S. Cochrane

Committee on Technology - Mining Methods

(member)-----K. Barron

CANADIAN NATIONAL COMMITTEE ON ROCK MECHANICS (CNCRM)

(secretary-treasurer)-----W. M. Gray/D. Hedley

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Subcommittee on Rock Breakage (member)-----W. M. Gray

Subcommittee on Backfill (secretary)-----G. Zahary

Subcommittee on Rock Mechanics Instrumentation

and Subsidence (member)-----D. Hedley

Awards Panel Subcommittee (member)-----G. Zahary

CANADIAN ROCK MECHANICS GROUP (secretary-treasurer)---W. M. GrayCANADIAN NATIONAL COMMITTEE OF THE INTERNATIONALCOMMISSION ON ILLUMINATION

(COMMISSION INTERNATIONALE DE L'ECLAIRAGE) (CIE)

Technical Subcommittee TC-4.1 on Interior Lighting,

Subcommittee on Mine Lighting (member)-----A. L. Job

CANADIAN SOCIETY FOR CHEMICAL ENGINEERING - OTTAWA SECTION

(member executive committee)-----K. K. Feng

ELLIOT LAKE VENTILATION GROUP (members)-----G. Knight/M. Savich,

R. A. Washington

FEDERAL-PROVINCIAL REFEREE COMMITTEE ON MINEABILITYOF COAL (ALBERTA) (member)-----T. S. CochraneHAILEYBURY SCHOOL OF MINES, HAILEYBURY, ONTARIO

Advisory Committee (member)-----R. Tervo

INTER-DEPARTMENTAL STUDY TASK FORCE ON PRACTICALITYAND ECONOMICS OF PEACEFUL NUCLEAR EXPLOSIONS

(member)-----W. M. Gray

LETHBRIDGE COMMUNITY COLLEGE, LETHBRIDGE, ALBERTA

Mining Program Advisory Committee (member)-----H. U. Bielenstein

NATIONAL ADVISORY COMMITTEE ON MINING AND METALLURGY
RESEARCH (NACMMR)

Mining Subcommittee (member)-----G. Zahary

ONTARIO AGRICULTURAL COLLEGE (OF GUELPH UNIVERSITY),
GUELPH, ONTARIO

Cover Crop Committee (member)----- D.R. Murray

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY, SAULT
STE MARIE, ONTARIO

(municipality representative on board of governors)-----R. A. Washington

SUDBURY BASIN-ELLIOT LAKE RECLAMATION STEERING COMMITTEE

(members)----- G. Zahary
D. R. Murray

UNIVERSITY OF ALBERTA, EDMONTON, ALBERTA

Advisory Board to Department of Mineral
Engineering (member)-----K. Barron

STAFF CHANGES

<u>Regular</u>	<u>Appointed</u>	<u>Separated</u>	<u>Location</u>
Aubry, R.	02/09/75		Transferred to Ottawa from Quebec Office, RML
Kaplan, L.J.	14/10/75		On loan to Canadian Explosives Research Laboratory
McCready, R.G.L.	03/10/75		Elliot Lake Laboratory
Sabourin, R.	28/08/75		Rock Mechanics Laboratory
Sarson, S.L.	05/08/75		Western Office,
Southgate, J.E.	02/09/75		Rock Mechanics Laboratory

Term/Casual

Burns, N.		01/04/75	Rock Mechanics Laboratory
Folta, Janna	18/06/75		Rock Mechanics Laboratory
Fraser, M.	01/04/75		Rock Mechanics Laboratory
Hebert, M.	24/08/75		Rock Mechanics Laboratory
Lee, T.		21/03/75	Elliot Lake Laboratory
Nipius, J.	06/01/75	31/03/75	Elliot Lake Laboratory
Sambhi, B.		12/09/75	MRL - Administration
Wong, A-H.	02/09/75		Rock Mechanics Laboratory

Students

Anderson, S.	06/05/75	03/09/75	Western Office
Baines, R.	02/05/75	05/05/75	Elliot Lake Laboratory
Baumgartner, P.	01/05/75	29/08/75	Western Office
Dales, G.	16/05/75	03/09/75	Western Office
Dang, S.	01/05/75	29/08/75	Western Office
Everleigh, K.	12/05/75	29/08/75	Elliot Lake Laboratory
Kirk, B.	28/04/75	22/08/75	Elliot Lake Laboratory
Morrison, H.		24/04/75	Rock Mechanics Laboratory
Sekera, P.	18/08/75	29/12/75	Elliot Lake Laboratory
Smith, R.	05/05/75	22/08/75	Elliot Lake Laboratory
Stewart, B.	06/01/75	25/04/75	Elliot Lake Laboratory

Post Doctorate Fellows

Just, G.D.	18/08/75		Elliot Lake Laboratory
Lee, H.H.		31/03/75	Elliot Lake Laboratory
Livesey, D.B.		02/10/75	Western Office

APPENDIX

Listing 1975 Contacts with Government Departments and Industry

CONTACTS WITH GOVERNMENT DEPARTMENTS AND INDUSTRY
MINING RESEARCH LABORATORIES

<u>Organization or Person</u>	<u>Purpose</u>
Prof. J.C.Roegiers, Dept. of Civil Eng. U. of Toronto	Rock mechanics research - methods of government funding
Messrs. Bush, Faulkner, Gonzalez, Madrazo and Martinez, Industrial Mineral, Mexico, S.A.	Contact with MSD re beneficiation problems; contact with ERL re certification program
R.R.Maclachlan, Assoc. Prof. O.T.Djanganz, Asst.Prof. McGill University, Dept. of Mining and Engineering	Projects in environmental field; Methods or mechanisms of govt. financing open to McGill
T.Patching, U. of Alberta (in his capacity of Commissioner re Safety in Devco Mines)	Royal Commission Report "Report of the Royal Commission Appointed to Inquire into the Explosion and Fire in No. 4 Mine at Springhill, Nova Scotia, on 1st day of November, 1956." Halifax, Nova Scotia, Queens Printer, 1957
T.Davis, Asst. Executive Director, Coal Association of Canada	Role of Coal Association of Canada in 6th International Strata Control Conference
Mr. MacPhail, Dolomite Quarry, Renfrew, Ontario	Problems of mining in a small quarry 3000-4000 tons/week
Wang Pei-Lee, 3rd Secretary Peoples Republic of China Embassy	China's participation in 6th Int. Strata Control Conference
Geo. Strymtich, Chief Engineer, Manalta Coal Ltd., Calgary	Manalta mineability proposal, hydraulic monitoring, jet technology
J.H.Hobes, Robertson Research North American Ltd.	French mining technology.
Mr. Haney, Privy Council Office	Brief to Ham Commission - attendance at joint meeting with NHW, Labor, AEB, EMR, PCO
Dr. R.Liegeois, INIEX	Communication system in mines. Available outlets in Canada for INIEX system.
J.Morris, Vice-President of Operations, Luscar Ltd.	Role of Mr. Morris and Coal Association in preparation for 6th Int. Strata Control Conference

Mr. Willoughby,
Australia

Organization of Mining Research
Laboratories

Mr. R.G.Yourt,
Toronto

Standards - Respirable Dust -
Sweden

J.Currie, Director,
Dept. of Labour, (Accident
Prevention and Compensation)

Availability of Coal Inspectors
for Sydney area

Mr. R.J.Hamilton (MRDE)
Mr. K.Bower (HQ)
National Coal Board, U.K.

Research on measurement and control
of dust in mines

Mr. J.W.Moerman, Mine Manager,
Mr. Robert Cyr, Noranda Research
Centre, Brunswick Mining and
Smelting Corp. Ltd.

Planning for survey of noise at
underground operations of No. 12
Mine

K.Notley

Springhill data. Gas explosion apparatus
for bench display

Jan Zak, M.Sc. (Eng.) Mrg. Inz.
Chief Mining Study and Design Office,
Poland

Coal mining Western Canada market
for Polish technology

AECB - Mining Safety Advisory Cttee.,
United Steel Workers of America -
Guest Speaker: Dr. V.E. Archer of
U.S.Dept. Health, Education and
Welfare, Public Health Service

Radiation Standards - Analysis of
USA data

R.Nowlan, Research Geologist,
Robertson Research Inc.

Coal projects in Western Canada --
coal mineability

CONTACTS WITH GOVERNMENT DEPARTMENTS AND INDUSTRY

ROCK MECHANICS LABORATORY

<u>Organization or Person</u>	<u>Purpose</u>
Univ. of Toronto	Govt. Contract Research
CIL,	Review of PAIT Submission by CIL
J.C.Leroy, Erocon Ltd., Toronto	Request of information in connection with revegetation aspects of proposal
Prof. Cossette, University of Sherbrooke	Information re revegetation activities
J.E.Faulkner, Jr. Chief Mine Engineer, Industrial Minera, Mexico, S.A.	To discuss problems of rock mechanics in general and the application of FE method in mining engineering in particular
Prof. B.Voight, Dept. of Geosciences, Pennsylvania State University	Discuss problems concerning the revision of paper submitted to Geological Society of America memoir
Louis G.Tanguay, Inspecteur en Chef des mines, Min.Richesses Naturelles du Québec	Discuter des méthodes de communications dans les mines souterraines. Obtenir des statistiques sur les accidents dans les mines en rapport avec les conditions d'instabilité de terrain
Prof. G.Archambault, Université du Québec à Chicoutimi	Enseignement d'un cours de traitement de minerais
Mr. R.Giesler, Centaur Mining Exploration Ltd.	Discussion of contract for research in diamond drilling
Angus G.Mackenzie	Discussion of contract for research in diamond drilling
Dr. Hutchinson, University of Toronto	Possible proposal for Arctic pollution (from long term lignite burning) investigation
Mr. R.Liégeois, INIEX (Belgique)	Pour accepter la visite de M.Liégeois, un expert en communication par radio dans les mines. Il viendra à Québec, les 24 et 25 mars prochain.

M. MacRae, Economic Policy Officer, Ministry of Trade & Communications, Toronto and W. Zonnenberg, Project Planning Officer, Ministry of Trade & Communications, Toronto	Transport of slurries in pipelines - research
W. G. Brissenden, Vice President of Mines, Noranda Mines Ltd.,	Mining of deep-sea nodules and aid of Canadian Navy
I. W. McCaig, Vice-President, Acres Consulting Services Ltd.	Diamond drill research contracts (costs)
E. P. Smith, President and B. Ryan, Heathwood Engineering Associates Ltd.	Diamond drill contracts (proposals)
R. A. Geisler, President, Centaur Mining Exploration Ltd.	Diamond drill contract (ore recovery)
Dr. K. Spink, Consulting Geologist, (U.K.)	Diamond drill research
D. C. Walker, President, Walker Vacuum Services Ltd.	Cleaning of coal dust from areas of belt conveyors by vacuum methods
Norah Allman, Northern Miner	To discuss subjects for articles in Northern Miner (met with Y. Yu and N. Toews re computer centre)
R. Hart, Consulting Geologist, Rio Algom Ltd.	Rio Algom's ore reserves
Rune Back, Managing Director, Atlas Copco AB, Stockholm, Sweden	Conference on drilling
Dr. Singh, University of Quebec, Montreal	Underground storage of nuclear waste. The use of ultra-basic rock formations
Dr. J. O'Shea	To discuss his preparation of part of the chapter on monitoring
Mr. Crosby, Mineral Resources Engineering Ltd. Kingston, Ontario	Information on use of draglines in open pit mining from A. Dubnie and IC 292
P. Potatoff, Union Miniere Explorations & Mining Corp. Ltd., Willowdale, Ont.	Sampling mineral deposits by percussion drilling
C. Steine, Manager, Diamond Drilling Association of Canada	Research in diamond drilling

Mr. F.Perry, Manager -
Explorations,
Gulf Minerals (Canada) Ltd.

Reserves of uranium ore in a
certain orebody

Mr. D.Sprague, Chief Mine Engineer,
Rio Algom Ltd.

Discussion re supply of data on
ore reserves

Mr. F.Perry, Manager -
Explorations,
Gulf Minerals (Canada) Ltd.

Discussion re cut-off grades for
Raven and Horseshoe orebodies

C.Rich, Mining Engineer,
USBM, Denver

Mining of thick coal seams

R.McGregor, Program Manager
Foster-Miller Associates,
Waltham, Mass.

General information on EMR activities
and contracts (in particular coal
mining).

Mr. Bachenis, Dr. E.E.N.Smith,
Eldorado Nuclear Ltd.

Discussion re classification of
ore reserves

CONTACTS WITH GOVERNMENT DEPARTMENTS AND INDUSTRY
 Canadian Explosives Research Laboratory

<u>Organization or Person</u>	<u>Purpose</u>
G. Westenhaefer Kingston, Ontario	Qualification as blaster
A. King, Queen's University, Kingston, Ontario	Bichel gauge testing
L. Utracki and J. Chan, Explosives Research Laboratory, Canadian Industries Limited, McMasterville, Quebec.	October 1st Explosion and promotion of laboratory co- operation.
R. Duprés, DuPont of Canada, North Bay	Bullet testing
K. V. Larsen, Dr. G. M. Thornley and Dr. S. M. Brockbank, Ireco of Canada Limited	Liaison re Ireco Production

CONTACTS WITH GOVERNMENT DEPARTMENTS AND INDUSTRY
Elliot Lake Laboratory

<u>Organization or Person</u>	<u>Service</u>
G. R. Yourt, Eldorado Nuclear	Research discussions
C. M. Barrett, Division of Mines, Ontario))) Discussions on radiation instrumentation
R. F. Scarth, Atomic Energy Control Board))
J. W. Wylie, Mines Accident Prevention Association of Ontario	Noise research discussions
A. R. Ballantyne, J. Scott, Environment Canada))) Discussions on Sudbury - Elliot Lake Revegetation Group Steering Committee
G. Courtin, Laurentian University))
Moruti Mphatsoe, Lesotho Government	Laboratory Tour
G. Laporte, International Nickel Company of Canada	Noise research discussions
D. M. Osborne, Glen Ames S.P. School, Toronto	Laboratory tour
J. Franklin, Consultant	Discussions on contributions to work groups of the International Society of Rock Mechanics
H. R. Konowalchuk, Falconbridge Nickel Mines Ltd.)))
D. R. Lane-Smith, University of Western Ontario))) Job Interviews
K. C. Cheng, International Nickel Company of Canada))

J. Chan,
Agnew Lake Mine

Discuss test work

J. Chakravatti,
Denison Mines Ltd.

Radon daughter measurements

J. R. Morgan,
Sir Sandford Fleming College

Laboratory tour

P. B. McCrodan,
E. W. Isaac,
Ministry of Natural Resources

Discuss dust research
program

R. Cyr,
Noranda Research Centre

Research discussions

C. Pomroy
Health and Welfare Canada

Lead 210 skull scanner

G. Grassmuck and 12 Engineers,
Industrial Minera Mexico, S. A.,
Asarco, S. A.

Laboratory tour

V. Pakalvis,
L. Gregg,
V. Freelandt,
R. Pedign,
S. Lee,
Falconbridge Nickel Mines Ltd.

Rock mechanics instrumentation
discussions

A. R. Brazeau,
Dept. of Supply and Services.

Contract selection committee.

W. A. Bardswick,
Ontario Ministry of Natural Resources

Discussions on gravimetric sampling

T. Carmichael,
T. G. Clendenning,
C. F. Lee, and R. B. Watts,
Ontario Hydro Research.

Discussions on rock testing
methods

H. B. McLean,
V. Rivers,
Mines Accident Prevention Association
of Ontario

Discussions on gravimetric
sampling

J. Vergunst,
Denison Mines Limited

Radon daughter measurements

D. Willoughby,
CSIRO, Australia

Discussions on research
activities in Canada and
Australia.

P. Landry,
University of Sherbrooke

Laboratory tour

S. Fedoruk,
P. Hamel,
A. Prince,
R. Scarth,
Atomic Energy Control Board

Discussions on dust and radiation
in uranium mines

L.R. McCullough,
Brian Jeffrey,
Powers Conspec.

Continuous Monitoring Contract

Dr. Z. Reif,
University of Windsor

Discussions on noise research

A.D. McCutcheon,
Canadian Mine Services

Discussions on pillar stability of
Elliot Lake uranium mines

R. Liegeois,
INIEX, Belgium

Research discussions and visit to
Rio Algom on underground
communications.

R.J. Seibel,
R.C. Bates,
U.S. Bureau of Mines

U.S. Bureau of Mines cooperative
projects

G.B. Knight
Atomic Energy Control Board

Radon measurements on
tailings

R. Cannon,
Mines Inspector,
Ontario Ministry of Natural Resources

Laboratory tour

H. Seguin,
J. Rock,
J. Scott,
G. Seguin,
R. Lavin,
E. Vance,
B. Beemer,
United Steel Workers of America

Tour of laboratory and
presentation of environmental
research activities

F.J. Leahy,
Mount Isa Mines Ltd.,
Australia

Discussions on rock mechanics
research at Mt. Isa and in
Canada

D. L. Adams,
J. Crosby,
Marshall Macklin Monaghan Ltd.

Discuss geology of
Elliot Lake area

C. J. Hodgson, Geology Department,
Queen's University
and 70 students.

Laboratory tour

W. T. Elliott,
International Nickel Company of Canada Ltd.

Gravimetric sampling

P. F. Pullen,
K. Black,
Rio Algom Mines Ltd., Toronto

Gravimetric sampling

R. W. Miller,
MDA Scientific Inc.

) Discuss Instant Working Level
) Meter
)

R. Peacock,
Rio Algom Mines Ltd.

)
)
)

T. Edwards,
J. A. Bates,
Watts Griffis and McQuat Ltd.

) Discussions on pillar stability at
) depth in Elliot Lake uranium
) mines

D. Stone,
Beak Consultants

Research discussions

D. W. Bryant,
Environment Canada,
Burlington.

Cooperative research project

R. S. Saunders,
Rio Algom Mines Ltd.

Discuss design of mine shafts
for ventilation

CONTACTS WITH GOVERNMENT DEPARTMENTS AND INDUSTRY

Western Office, Calgary

<u>Organization or Person</u>	<u>Service</u>
O. Gorgichuck, E. Serochuck, D. Layer, Imperial Oil Ltd.	Discussions on dragline mining methods for plains coal seams, information and services available from MRL.
M. Oldershaw, Geodigit Ltd.	Computing.
Prof. T. Patching, Dr. M. Jeremec, University of Alberta, Mineral Engineering Department.	Potential research areas for University of Alberta graduate students.
J.M.E. Romocki, R.M. Hardy Associates Ltd.	Discuss chemical laboratory service.
P. Stokes and D. Bodie, Kaiser Resources Ltd.	Discussion of Hosmer-Wheeler project and Kaiser research plans.
Y. Horacek, Alberta Energy Resources Conservation Board.	Discuss exploration permits, Alberta decision to do resource evaluation on its own.
H. McGillivray, Manalta Coal Ltd.	To discuss research work in coal.
D. Bullock and P. Colling, Dames & Moore.	General discussion on Western Canadian coal.
J.D. Hughes, Consolidated Coal Ltd., Red Deer.	To discuss potential employment with the GSC in the coal section.
M. Marko and P. Simpson, H.G. Acres Ltd.	Discussions on coal.
J. Champagnat, Stephanoise, France.	Wanted information on new mine developments for sales contacts for his company.
D. Gatto, Student, University of Calgary.	Geological students planning a display on coal.
Mr. Zak, Polish Trade Mission; Sponsored by Dept. Trade & Commerce.	Discuss mining in Western Canada.

Organization or PersonService

Prof. M. Jeremic and Prof. B. Stimson,
University of Alberta, Mineral
Engineering Department.

Discuss potential research areas of
University of Alberta students and staff.

N. Duncan,
Alberta Energy Resources
Conservation Board.

Mine safety in Alberta, invitation to
meeting of ERCB on December 2, 1975.

G. Strmotich,
Gregg River Resources, Calgary.

Discuss mining in West Germany; open pit
feasibility study.

R. Nolan,
Robertson Research Ltd.

Discuss geology to mining in Foothills
and Rocky Mountains.

P.J. Simpson,
Acres Consulting Services.

Discuss mining methods for 'plains coal',
a combined stripping and longwall method.

Dr. D.B. Livesey,
Montreal Engineering, Montreal, P.Q.

Discuss Wabamun coal mine, ground water
and pit floor problems.

Dr. D.B. Livesey,
Montreal Engineering, Montreal, P.Q.

Discussion and programming Saskatchewan
mineability.

J. Haber
Robertson Research,
and PD-NCB Consultants

General discussions on coal mining in
Western Canada.

R.L. Sipprell
Atlas Copco

To discuss drill specifications and
alterations.

E. Heap
Shell Oil

Looking for information and data on mining
and subsidence in Lethbridge area.

R. Nolan
Robertson Research

Discussions on mining methods and problems
in Western Canada.

D. MacFarlane
Ayreshire Farms Ltd.

Discuss their prospecting of Compton Creek
area and arrangements with McIntyre.

J. Haber
Robertson Research

To discuss coal properties in Western
Canada - progress on Robertson Research
program.

J. Champagnat
Stephanoise Ltd.

Discussions on monorail system.

FIELD WORK AND VISITS
Mining Research Laboratories

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Cochrane, T.S.	May 4-8	<u>Toronto, Ontario</u> - To attend the 77th Annual General Meeting of Canadian Institute of Mining and Metallurgy-1975 for the following purposes: to chair a meeting of Canadian Executive Committee of 6th International Strata Control Conference, 1977; to report to Executive of Coal Division, CIM, re progress on arrangements for 1977 Conference; to chair a technical session of Coal Division, CIM.
	May 14-June 8	<u>Paris, France and London, England</u> - To attend a meeting of Paris Mining Society. To chair 2nd meeting of International Organizing Committee of 6th International Strata Control Conference, 1977. To meet with European specialists in hydraulics and hydraulic coal mining to discuss problems associated with hydraulic mining of coal in Western Canada.
	July 15	<u>Quebec City, Quebec</u> - To visit Quebec Office to discuss its closing.
Cochrane, T.S. & Tupper, E.C.	Aug. 20	<u>Quebec City, Quebec</u> - To visit Quebec Office to close it.
Cochrane, T.S.	Sept. 14-23	<u>Saskatoon, Sask., Calgary, Alta. and Vancouver, B.C.</u> - To attend 32nd Provincial Mines Ministers' Conference. To attend 27th Canadian Conference of Coal to discuss 6th International Strata Control Conference developments with coal mining authorities and co-operative research with NCB delegate, Mr. P. Tregelles. To visit research establishments at Edmonton, Calgary and Vancouver, research programs in energy field.
	Oct. 24-25	<u>Toronto, Ontario</u> - To discuss project proposals and services contracts with MAPAO and Ontario Ministry of Natural Resources.
Gray, W.M.	Apr. 22-25	<u>Saskatoon, Sask., Edmonton and Calgary, Alta.</u> - To attend annual meeting of the Canadian National Committee on Rock Mechanics. To visit Prof. J. Tulip, Univ. of Alta., as Contact Officer for research agreement on laser rock breakage. To visit Western Office to discuss research problems.

Gray, W.M. (cont'd)	May 21-23	<u>Toronto, Ontario</u> - To attend the Annual Meeting of the Mines Accident Prevention Association of Ontario.
	May 26	<u>Toronto, Ontario</u> - To present the CANMET brief to the Ontario Royal Commission on the Health and Safety of Workers in Mines.
	July 21-23	<u>Elliot Lake, Ontario</u> - To visit Elliot Lake Laboratory for consultations on work elements of the Mining Research Project and to meet with members of the Atomic Energy Control Board who were visiting the Laboratory.
	Sept. 11	<u>Bathurst, N.B.</u> - To attend meeting at Brunswick Mining and Smelting Corp. Ltd., with representatives of Brunswick Mining and Noranda Research Centre, to discuss a co-operative program of research on noise production at underground operations.
	Sept. 16-17	<u>Elliot Lake, Ontario</u> - To attend a meeting to discuss work elements in the Mining Research Project.
Tupper, E.C. & Aubry, R.	Sept. 19	<u>Quebec City, Quebec</u> - To visit Quebec Office to arrange removal of furniture and laboratory equipment to Ottawa.
Tupper, E.C.	Sept. 23	<u>Quebec City, Quebec</u> - To visit Quebec Office to oversee the loading of furniture and equipment to be transported to Ottawa.

FIELD WORK AND VISITS
Rock Mechanics Laboratory

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Dubnie, A.	April 14-15	<u>Quebec City, Quebec</u> - To attend the 32nd Annual General Meeting of the Canadian Diamond Drilling Association as third author of a paper on development of a portable diamond drill for exploration drilling in frontier areas.
	April 27-30	<u>Elliot Lake, Ontario</u> - To visit uranium mining companies for the purpose of reconciling mining company and EMR ore reserve calculations.
	June 8-14	<u>Stockholm, Sweden</u> - To attend a conference on bench drilling as a guest of Atlas Copco.
Everell, M.D.	May 5-7	<u>Toronto, Ontario</u> - Pour assister au Congrès de l'Institut canadien de mines et métallurgie.
Fustos, A.	April 27-30	<u>Elliot Lake, Ontario</u> - To visit uranium mining companies for the purpose of reconciling mining company and EMR ore reserve calculations, and re-calculation of certain reserves at Denison Mines.
	June 22-Aug.22	<u>Elliot Lake, Ontario</u> - To visit for the purpose of recalculation of main reserves at Denison Mines. Systematic accumulation of diamond drilling data from the past 15 years to form an accurate basis for uranium reserve calculations at Denison Mines is being carried out.
	Oct. 27-31	<u>Toronto, Ontario</u> - To visit mining companies to assess uranium ore reserves.
Fustos, A. & Sabourin, R.	Nov. 16-27	<u>Edmonton & Calgary, Alta.; Uranium City, Rabbit Lake & Saskatoon, Sask.</u> - To visit mining companies in Western Canada to assess uranium ore reserves.
	Dec. 10-13	<u>Montreal, Quebec</u> - To visit Brinex Ltd. to assess uranium ore reserves.
	Dec. 16-19	<u>Bancroft, Ontario</u> - To visit Madawaska Mines Ltd. to assess uranium ore reserves.
Fustos, A.	Dec. 30	<u>Bancroft, Ontario</u> - To return confidential documents on short loan from Madawaska Mining Co.

Gyenge, M.	May 13	<u>Haley, Ontario</u> - To visit Chromasco Ltd. open pit operation to discuss their problem and give advice.
	June 23-27	<u>Montreal, Quebec</u> - To attend the American Society for Testing and Materials Symposium on the Preparation of Specimens for Laboratory Testing, and to serve as Chairman for Session 1 on Preparation of Rock Specimens.
	Oct. 10	<u>Elliot Lake, Ontario</u> - To visit Elliot Lake Laboratory to discuss testing procedures to be included in the Pit Slope Manual.
Job, A.L.	Sept. 2	<u>Kingston, Ontario</u> - To attend 10th Canadian Rock Mechanics Symposium as co-author of a paper.
Larocque, G.E.	June 19	<u>Waterloo, Ontario</u> - To interview Waterloo University Students for positions at the Mining Research Laboratories.
	June 26	<u>Beloeil, Quebec</u> - To discuss IRAP grant and review of Queen's University Blasting Chapter.
	July 15	<u>Quebec City, Quebec</u> - To visit Quebec Office to discuss its closing.
	Aug. 20	<u>Quebec City, Quebec</u> - To close Quebec Office.
Larocque, G.E. & Kapeller, F.	Oct. 5-10	<u>Williams Lake and Fernie, B.C. and Calgary, Alta.</u> - To visit Gibraltar Mines, Fording Coal Mine; Kaiser Coal and the Western Office to check on the performance, repair and transfer of monitoring and measurement equipment.
Larocque, G.E.	Nov. 5	<u>Waterloo, Ontario</u> - To visit Waterloo University to interview Co-op Students.
	Nov. 24-25	<u>Montreal, Quebec</u> - To visit Prof. O'Shea at Ecole Polytechnique re Pit Slope Project.
	Dec. 6	<u>McMasterville, Quebec</u> - To visit Canadian Industries Ltd. re Blast 326 (NRC).
Sabourin, R.	Oct. 5-27	<u>Clausthal, Germany and Frascati, Italy</u> - To present paper at two conferences on Geostatistics. Oct. 6-10 - APCOM Meeting. Oct. 31-24 - NATO Advance Study, Geostat Rome 75.
Sage, R.	May 2	<u>Toronto, Ontario</u> - To address a meeting of Canadian Chief Mining Inspectors on the Pit Slope Stability Project at C.I.M.

Sage, R. (cont'd)	May 29-June 1	<u>Thompson, Manitoba</u> - To finalise Pit Slope Project contract with I.N.C.O.
	July 31	<u>Thompson, Manitoba</u> - To review progress on the support installation at Pipe Mine, I.N.C.O.
	Aug. 12-22	<u>Prince George, B.C.</u> - To visit Endako Mine and Gibraltar Mine to discuss potential and actual work; <u>Vancouver, B.C.</u> - To review progress on the Klohn Leonoff Consultants tailings dam design proposal; <u>Los Angeles, Calif.</u> - To discuss probability techniques for the Design Chapter with Dames and Moore; <u>Cuba, New Mexico</u> - To view the support installation at Nacimiento Mine; <u>Tucson, Arizona</u> - To review progress on the support supplement with Seegmiller Associates.
	Sept. 3	<u>Watertown, N.Y. and Kingston, Ontario</u> - To meet Ken Mathews, U.B.C., Symposium Chairman in Watertown, travel with him to Kingston to make arrangements for Pit Slope Project Symposium, 1976.
	Sept. 29	<u>Sept Iles, Quebec</u> - To discuss drafting a case history of Permafrost for the Pit Slope Manual with officers of the Iron Ore Co. of Canada.
	Nov. 3-7	<u>Vancouver, B.C.</u> - To attend meeting of organising committee of 11th Rock Mechanics Symposium. To discuss technical writing of Pit Slope Manual with Peter Bell, Editor, Western Miner; <u>Fraser Lake, B.C.</u> - To review progress on the Pit Slope Project at Endako Mine; <u>Thompson, Manitoba</u> - To review progress on the Pit Slope Project at I.N.C.O.
	Dec. 10	<u>Schefferville, Quebec</u> - To write a case history of permafrost mining at the Iron Ore Co. Canada for the Pit Slope Project.
Service, M.M.	Oct. 28-30	<u>Elliot Lake, Ontario</u> - To visit Elliot Lake Laboratory to review accounts of the Revegetation Contracts of the Pit Slope Project; to transport, explain and hand over Subcommittee files of the Canadian National Committee on Rock Mechanics to Dr. D. Hedley, Honourable Secretary.

Service, M.M. (cont'd)	Dec. 17-19	<u>Denver, Colorado</u> - To discuss the draft changes of the Statutes of the International Society for Rock Mechanics and to meet with the Business Officer of Dames & Moore to review reporting and invoicing requirements for Pit Slope Project contract.
Yu, Y.S.	June 26	<u>Maniwaki, Quebec</u> - To travel to Renzy Mines to assist Mineral Sciences Laboratories in examining the rock faces of the mine for their sampling program.
Yu, Y.S. & Toews, N.A.	July 21-25	<u>Newport, Rhode Island</u> - To attend a course on Advanced Topics of Finite Element Stress Analysis.

FIELD WORK AND VISITS
Canadian Explosives Research Laboratory

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
J.A. Darling	Jan. 7	<u>Beloeil, Quebec</u> - Visited Canadian Industries Limited, Explosives Research Laboratory, to supervise the National Research Council project "Explo 147".
J.A. Darling R.R. Vandebeek	April 16	<u>Ottawa, Ontario</u> - Attended a meeting with Mr. E.J. Fraser, Chief Inspector of Explosives, and representatives from Canadian Industries Limited, DuPont of Canada and Defence Research Establishment Suffield, to discuss the testing of insensitive explosive liquids.
J.A. Darling	April 21-22	<u>Kingston, Hinchinbrook, Ontario</u> - To monitor the burning trials of Canadian Industries Limited liquid explosives sample.
	May 1	<u>Ottawa, Ontario</u> - Attended a meeting with Mr. Tate, Her Majesties Inspector of Explosives - Home Office, Britain, to discuss the hazard supervision of SI from Canadian Industries Limited and Imperial Chemicals Incorporated.
	May 19-23	<u>Calgary, Alberta</u> - At the request of the Chief Inspector of Explosives, visited the Defence Research Establishment Suffield, to supervise the Classification Test for transport of liquid explosives sensitizer to the U.S.A.
	July 8	<u>Valcartier, Quebec</u> - Visited the Defence Research Establishment Valcartier, to deliver rocket motors for testing, and to confer with T. Roberts regarding pyrotechnics for Canadian Association of Chiefs of Police.

J.A. Darling (cont'd)	Aug. 5, 25, 29	<u>Ottawa, Ontario</u> - Attended meetings with Dr. K. Kolman, Canadian Industries Limited, Mr. R. Dupré, DuPont of Canada Limited and Mr. K. Larsen, Dr. Thornlea and Dr. Brockbank from Ireco Canada Limited, to discuss bullet impact and precariousness.
	Aug. 12	<u>Kingston, Ontario</u> - Visited with Dr. A. Bauer, Queen's University, to schedule the performance of burning trials.
	Sept. 11-12	<u>Bagotville, Quebec</u> - At the request of the Chief Inspector of Explosives, visited Alcan Limited to investigate dust formations, and to report to K. K. Feng on the Hartman Apparatus.
	Nov. 16-20	<u>Paris, France</u> - Under instruction from the Chief Inspector of Explosives, to arrange for international research on specifications for United Nations classification of explosives class 1.5, at the steering committee meeting of the International Group on Unstable Substances at Paris France.
	Dec. 12	<u>McMasterville, Quebec</u> - Visited with Dr. E. Falconer, Canadian Industries Limited, to discuss assessment of project Explosives No. 147 of the Industrial Research Assistance Program, National Research Program.
	Dec. 23-24	<u>Montreal, Quebec</u> - In company with Mr. E. J. Fraser and Mr. B. P. McHugh, visited DuPont of Canada and Canadian Industries Limited, to discuss revisions in Class 2 Explosive Classification.
K. K. Feng	March 7	<u>Toronto, Ontario</u> - Visited Analygas System Limited in Toronto, to observe and discuss the monitoring system on early detection of spontaneous combustion.

K.K. Feng (cont'd)	May 7	<u>Toronto, Ontario</u> - Attended the 31st Annual Business Meeting of the Coal Division of Canadian Institute of Mining.
	June 19	<u>Toronto, Ontario</u> - Visited Analygas System Limited to check the monitoring system equipment on early detection of spontaneous combustion.
	July 10	<u>Toronto, Ontario</u> - Visited Analygas System Limited to check the CO Analyzer and the stability of the monitoring system on the early detection of spontaneous combustion in coal mines.
	Nov. 7	<u>Scarborough, Ontario</u> - Visited Analygas Limited to check the monitoring system equipment on early detection of spontaneous combustion.
R.R. Vandebeek	Feb. 17-21	<u>Dover, N.J., Pittsburgh, Penn.</u> - As chairman of the Subcommittee on Explosive Tagging, attended a session on detection of explosives at Picatinny Arsenal, Dover, N.J., and a session on tagging of explosives at the U.S. Bureau of Mines, Pittsburgh.
	Mar. 20	<u>Ottawa, Ontario</u> - As a member of the Committee on Aviation Security, attended a meeting to discuss activities and progress of the Subcommittee on Explosive Tagging.
R.R. Vandebeek J.A. Darling E. Contestabile	Apr. 13-18	<u>Ottawa, Ontario</u> - Attended a symposium on blast attenuation with the Committee on Aviation Security.
R.R. Vandebeek	April 14-15	<u>Boston, Mass.</u> - Attended a meeting of the U.S. Technical Subcommittee on Explosive Tagging.
	June 26-27	<u>Valcartier, Quebec</u> - Visited the Defence Research Establishment Valcartier, to discuss security equipment for airport environments, especially explosives detection.

R. R. Vandebek	July 15-19	<u>Boston, Mass.</u> - Attended a meeting of the U.S. Technical Subcommittee on Explosive Tagging.
(cont'd)		
	Nov. 19	<u>Ottawa, Ontario</u> - Attended a seminar on Bomb Detection with the National Research Subcommittee on Security Equipment.
	Dec. 3	<u>Montreal, Quebec</u> - Attended a meeting of the National Research Council Subcommittee on Security Equipment.
	Dec. 14	<u>St. Jean, Quebec</u> - At the request of the Chief Inspector of Explosives, attended a court session in St. Jean for infraction of the explosives act.
E. Contestabile	Dec. 12	<u>McMasterville, Quebec</u> - Visited Canadian Industries Limited, to discuss explosives production and test facilities, and methods of explosives testing.
	Aug. 17-22	<u>Philadelphia</u> - Attended a seminar on "Pyrotechnics and Explosives" at the Franklin Institute.
E. Contestabile		
B. Hendrick	Nov. 3-7	<u>Bruceton, Pa.</u> - At the request of the Chief Inspector of Explosives, to deliver samples of Class 2 explosives to the U.S. Bureau of Mines Safety Research Centre.

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Field Work and Visits
Mining Research Laboratories
Elliot Lake, Ontario

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
de Korompay, V.	Nov. 20-21	<u>Ottawa</u> - Mining Research Laboratories, CANMET, for discussions with Mr. T.S. Cochrane.
Hedley, D.G.F.	Jan. 13-16	<u>North Bay</u> - Air Defense Command, to inspect rock bolting installation in underground tunnels. <u>Ottawa</u> - To attend coordinators/managers meeting of Mining Research Laboratories.
	Jan. 17	<u>Falconbridge</u> - To discuss paper on rock mechanics for Canadian Institute of Mining and Metallurgy Annual Meeting, at Falconbridge Nickel Mines Ltd.
	Feb. 3-6	<u>Timmins</u> - Texasgulf Canada Ltd. to install extensometers underground, test rock bolts, and examine open pit walls.
	Feb. 10	<u>Sudbury</u> - International Nickel Company of Canada Ltd., Frood-Stobie Mine, to examine crown pillar to choose stress measuring sites and arrange diamond drilling by Company.
	Feb. 20-21	<u>Ottawa</u> - Mining Research Laboratories to discuss details of Mining Project.
	Feb. 25-28	<u>Sudbury</u> - To attend the Underground Operators Conference, take part in discussions and meet mining personnel.
	Mar. 2-7, Apr. 28-30	<u>Ottawa</u> - Mining Research Laboratories to discuss research statements with scientists in Mining Project.
	Mar. 16-19	<u>Goderich</u> - Sifto Salt Division, Domtar Chemicals Ltd. to repair load cells on cable bolts.
	Mar. 27	<u>Sudbury</u> - Falconbridge Nickel Mines Ltd., to discuss joint paper for CIM Annual Meeting. International Nickel Company of Canada Ltd., to discuss stress measurements at the Frood Mine.
	April 21-24	<u>Saskatoon</u> - Attend annual meeting of the Canadian Advisory Committee on Rock Mechanics. <u>Regina</u> - Discuss rock mechanics in potash mines with personnel from Dept. of National Resources, Saskatchewan.

Hedley, cont'd	May 4-7	<u>Toronto</u> - Attend the Annual General Meeting of the Canadian Institute of Mining and Metallurgy, to present a paper on "Some Practical Applications of Rock Mechanics in Canadian Mines" to a session of the Metal Mining Division.
	May 12-13	<u>Ottawa</u> - Visit the Director and Deputy Director of Canada Centre for Mineral and Energy Technology to discuss CANMET mining projects for the purpose of obtaining their approval of the program.
	May 20-23	<u>Timmings</u> - Visit Texasgulf Canada Ltd. underground mine and concentrator. <u>Sudbury</u> - Creighton Mine, International Nickel Company of Canada Ltd.
	June 9-12	<u>Timmings</u> - Texasgulf Canada Ltd. to take measurements with laser theodolite in open pit.
	June 25-27	<u>Ottawa</u> - To discuss National Minerals Research Program with the Director-General, CAN MET, and the Director, NMRP.
	July 21-22	<u>Timmings</u> - Texasgulf Canada Ltd., to take measurements in open pit with laser-theodolite.
	Aug. 6-8	<u>Ottawa</u> - To discuss progress in Mining Project with Minerals Research Program staff and other personnel.
	Aug. 21-22	<u>Winnipeg</u> - Manitoba Engineering and Inspection Branch, Dept. of Mines, to discuss groundwater and stability problems concerned with mining of gypsum.
	Sept. 1-4	<u>Kingston</u> - Attend the 10th Canadian Rock Mechanics Symposium, Kingston, to present a paper on behalf of a colleague who is overseas, and to attend an executive meeting of Canadian National Committee on Rock Mechanics, of which he is secretary.
	Oct. 23	<u>Agnew Lake</u> - Agnew Lake Mines, to visit site and discuss with personnel in-situ leaching and mining methods.
	Nov. 2-4	<u>Vancouver</u> - Attend meeting of the organizing committee for the 11th Rock Mechanics Symposium.
	Dec. 15-18	<u>Ottawa</u> - Attend Resource Appraisal Seminar and discuss research in Mining Activity, Mineral Research Program.

Herget, G.	Jan. 7-9	<u>Ottawa</u> - Attend Project Officers Meeting on format of Industrial Seminars for pit slope program.
	Jan. 27-29	<u>London, Ontario</u> - Present lecture on "Ground Stress Determinations in Canada" to Civil Engineering Seminar of University of Western Ontario.
	Mar. 20-21	<u>Kingston</u> - Attend selection committee meeting for papers submitted to the Canadian Rock Mechanics Symposium to be held in Kingston, September, 1975.
	Apr. 1-7	<u>Edmonton</u> - Discuss the submitted final reports for the B-Level Pit Slope Program for the period 1974/75 and define areas of work for the year 1975/76 with N.R. Morgenstern, D. Cruden and E. Eisenstein. <u>Vancouver</u> - Discussions as above with D. Piteau and Miller Engineering.
	May 12-13	<u>Ottawa</u> - As Activity Leader of Ground Control Program, to attend discussions with CANMET Director on the National Minerals Research Program.
	June 2-3	<u>Sudbury</u> - Visit International Nickel Company of Canada, Creighton Mine, to take extensometer readings. Visit Dresser Industrial Products Ltd. to discuss double tube swivel type core barrel.
	July 7-12	<u>Calgary</u> - Roke Oil Enterprises Ltd., to discuss geophysical borehole logging with K. Banks. <u>Edmonton</u> - University of Alberta, to discuss progress on contract for pit slope design with N.R. Morgenstern, D. Cruden and Z. Eisenstein. <u>Kamloops</u> - Bethlehem Copper Ltd., to visit field site of testing and structural investigations. <u>Williams Lake</u> - Gibraltar Mines Ltd., to visit field site as above. <u>Vancouver</u> - Piteau Gadsby MacLeod Ltd. and Miller Engineering Surveys, to assess progress on pit slope contracts.
	July 21-26	<u>Timmins</u> - Texasgulf Canada Ltd., Kidd Creek Mine, to assess condition of pit slope below haul road (SE) and to take stereophotographs. To discuss future work program.
	Aug. 7-8	<u>Ottawa</u> - To attend meeting on pit slope project.

G. Herget,
continued

Sept. 13-24

Aachen, West Germany - To attend the 2nd International Conference on Application of Statistics and Probability in Soil and Structural Engineering, as representative of the Mining Research Laboratories.

Hannover, West Germany - To discuss future programs for cooperative applied research between Federal Geological Survey and Mining Research Laboratories.

Dec. 1-5

Ottawa - To attend Pit Slope Meeting.

Toronto - Visit Ontario Hydro to discuss the use of geophysical equipment in site investigations, with T. Carmichael.

Visit University of Toronto, Prof. Roegiers, Civil Engineering Dept. to discuss ISRM Standards.

Knight, G.

Apr. 9-11

Timmins - Discuss the dust sampling program at Texasgulf Canada Ltd., and attend the Timmins Group Ventilation Meeting.

May 11-23

Timmins - Carry out dust measurements at Kidd Creek Mine, Texasgulf Canada Ltd.

May 30-
June 8

Minneapolis - Attend the annual conferences of the American Conference of Governmental Industrial Hygienists and the American Industrial Hygiene Association. He is taking an active part by chairing one session.

June 12

Sudbury - International Nickel Co. of Canada Ltd., Creighton Mine tour, and attend the Elliot Lake-Sudbury Ventilation Group Meeting.

July 24-28

Toronto - To discuss X-ray diffraction equipment requirements for quartz analysis with the Ontario Dept. of Natural Resources and Philips Electronics following a request by the Ontario Department.

Aug. 12-14

Ottawa - To discuss dust program with D. R. Farrell.
Timmins - To discuss past and possible future dust studies.

Sept. 6-26

Johannesburg - To attend International Ventilation Congress and present a paper; visit Cornerhouse Laboratories; visit Chamber of Mines Laboratories; visit one gold mine.

Edinburgh - To attend the British Occupational Hygiene Society International Symposium on Particles.

Knight, G. continued	Nov. 5-6	<u>Timmins</u> - Texasgulf Canada Ltd., to discuss ventilation, engineering and production requirements for detailed studies of dust production and control on LHD equipment.
McCreedy, R.	Nov. 2-5	<u>Ottawa</u> - Visit Mineral Science Laboratories for research discussions with H. McCreedy.
	Nov. 9-16	<u>Reno, Nevada</u> - Attend Inplace Leaching and Solution Mining Conference, MacKay School of Mines, University of Nevada.
Miles, P.	Feb. 25-28	<u>Sudbury</u> - Attend the Underground Operators Conference and take part in discussions and meet mining personnel.
	May 12-15	<u>Timmins</u> - Texasgulf Canada Ltd., to monitor open pit slope with laser-theodolite, and to take photographs of open pit with photo-theodolite.
	June 23-25	<u>Timmins</u> - Texasgulf Canada Ltd., Kidd Creek Mine, to take photographs of pit slope with phototheodolite.
	July 21-26 Aug. 25-28 Oct. 27-31	<u>Timmins</u> - Texasgulf Canada Ltd., Kidd Creek Mine, to assess condition of pit slope below haul road (SE) and to take stereophotographs. To discuss future work program. Monitor SE wall of open pit with laser theodolite
	Oct. 20-25	<u>Ottawa</u> - To attend Scientific Report Writing Workshop at 558 Booth Street.

Moffett, D.	Jan. 6-10	<u>Guelph</u> - Attend "Metals in the Biosphere" Conference and a two-day workshop on "Metals in Agriculture" at the University of Guelph.
	Apr. 21-23	<u>Toronto</u> - Visit with Ministry of Environment officials and tour their laboratory.
	May 13-17	<u>Ottawa</u> - Bi-monthly report and discussion with Mr. McCreedy, attend Canadian Uranium Producers' Metallurgical Committee, and meet with Department of Environment officials.
	Sept. 30- Oct. 4	<u>Uranium City, Saskatchewan</u> - Visit Beaverlodge uranium mine as part of a review of underground milling and waste disposal practices in Canada.
	Nov. 5-6	<u>Sudbury</u> - Attend a Technology Transfer Seminar on Mining Effluent Treatment Technology.
	Dec. 1-5	<u>Ottawa</u> - Quarterly discussions with H. McCreedy and use of CANMET library.
Montone, H.	Mar. 3-5	<u>Montreal</u> - Demonstrate the laser theodolite instrumentation at Ecole Polytechnique.
	Oct. 27-31	<u>Timmins</u> - Texasgulf Canada Ltd., Kidd Creek Open Pit, to take photographs of SE wall of open pit with phototheodolite and to monitor SE wall with laser theodolite.

Murray, D. R.	Jan. 7-9	<u>Ottawa</u> - Attend Project Officers Meeting.
	Jan. 27-29	<u>Toronto</u> - Direct a debriefing session of revegetation contractors at the Royal York Hotel.
	Feb. 10-15	<u>Sydney, Nova Scotia</u> - Cape Breton Development Corporation to visit with L. Boutlier and Dr. Cunningham regarding revegetation of coal spoils. <u>Ottawa</u> - Attend Selection Committee for Revegetation Contracts 1975-76
	Mar. 5-6	<u>Ottawa</u> - Attend oral presentation of preliminary report of contract work by Gregory Geoscience. <u>Montreal</u> - Review contract report submitted by Montreal Engineering.
	Mar. 10	<u>Sudbury</u> - Attend meeting of Sudbury Basin - Elliot Lake Reclamation Steering Committee.
	Apr. 20-23	<u>Ottawa</u> - Present lecture at University of Ottawa and discuss contract administration with R. Sage and M. Service.
	June 8-10	<u>Flin Flon</u> - Hudson Bay Mining and Smelting Contractors, to visit and examine sites being studied and review contract details.
	June 12	<u>Ottawa</u> - To review field sampling plans for contract work with Sherbrooke University. Meeting held at 555 Booth Street.
	June 16-26	<u>Vancouver</u> - University of British Columbia, to visit contractors, examine sites being studied and review contract details. <u>Calgary</u> - R. M. Hardy and Associates Contractors, as above.
	July 2-5	<u>Sydney, N.S.</u> - Visit National Gypsum, Milford Station, in association with contract work being conducted by Research Productivity Council of New Brunswick.
	July 14-18	<u>Quebec</u> - To visit and discuss problems with personnel involved, at mine sites under contract in the Val d'Or, Malartic, Normetal, Matagami and Noranda mining areas, with C. Drouin of Quebec Metal Mining Association. These areas are covered by Sherbrooke University contract on waste characterization.

Murray, D. R. continued	Aug. 7-19	<p>To visit contractors involved with waste inventory study to assess progress to date, visit sites and review problems with personnel:</p> <p><u>Ottawa</u> - Gregory Geoscience.</p> <p><u>Endako, B.C.</u> - U.B.C. Contractor and Endako Mine.</p> <p><u>Edmonton</u> - Alberta Forest Service and R. M. Hardy Associates.</p> <p><u>Winnipeg</u> - Hudson's Bay Mining and Smelting.</p> <p><u>Sherbrooke, P.Q.</u> - University of Sherbrooke.</p>
	Sept. 26-28	<p><u>Ottawa</u> - Gregory Geoscience, Mr. Allan Gregory, to examine proofs of a cross-referencing table and maps as a sample of waste inventory format.</p>
	Oct. 16-17	<p><u>Sudbury</u> - Laurentian University, to participate in discussions and visit experimental tailings revegetation sites.</p>
	Dec. 1-3	<p><u>Ottawa</u> - To participate in Pit Slope Manual meeting.</p>
	Dec. 8-12	<p><u>Guelph</u> - Attend the Ontario Cover Crop Committee 5th Annual Workshop at the University of Guelph, and to spend an extra day to discuss the proposed formation of the Canadian Association for Land Reclamation.</p>
Poliquin, H.	Feb. 4-6	<p><u>Sudbury</u> - International Nickel Company of Canada Ltd., Frood-Stobie #7 Mine, to carry out tests on modified automatic current controller for the raise borer.</p>
	Feb. 13, Feb. 26-27, Mar. 3	<p><u>Sudbury</u> - International Nickel Company of Canada Ltd., Frood-Stobie #7 Mine, to conduct experiments with the automatic hydraulic pressure controller on the raise borer, and to bring out the instrumentation from the raise borer site.</p>
	May 28	<p><u>Sudbury</u> - Frood-Stobie #7 Mine, to discuss raise boring control study with Mr. E. Bergen and to attempt to bring back to Elliot Lake the damaged instrumentation trailer previously used underground.</p>

Poliquin, H. continued	June 9	<u>Sudbury</u> - International Nickel Co. of Canada, Stobie Mine, to perform work on control trailer.
	June 26	<u>Sudbury</u> - International Nickel Co. of Canada, to discuss electrical connections to be made to the 61R raise borer so that our current controller can be used with their new saturable reactor.
	July 29-30 Aug. 6, 12, Sept. 3, 15, Sept. 24, 29 Oct. 15, 16, 21 Nov. 24-25, 28	<u>Sudbury</u> - International Nickel Co. of Canada Ltd., Frood-Stobie #7 Mine, to carry out tests on the raise borer motor current and hydraulic pressure controller.
Savich, M.	Apr. 29- May 3	<u>Atlanta, Georgia</u> - Attend the National Noise and Vibration Control Conference and Exhibition, to obtain information on noise research, inspect new instrumentation and participate in discussions.
	May 20-23	<u>Toronto</u> - Attend the Mines Accident Prevention Association of Ontario meeting to present the paper, "Rock Drill Noise Attenuation".
	June 12	<u>Sudbury</u> - International Nickel Co. of Canada Ltd., Creighton Mine tour and attend the Elliot Lake - Sudbury Ventilation Group Meeting.
	Aug. 10-12	<u>Ottawa</u> - Visit Mining Research Laboratories to discuss Noise Project, and visit Personnel Department.
	Sept. 10-12	<u>Bathurst, N.B.</u> - Discuss a work plan and time schedule for measurement of noise in mines with members of Noranda Research and New Brunswick Mining and Smelting
	Oct. 23 - Nov. 16	<u>Bathurst, N.B.</u> - Conduct a noise survey at underground operations of No. 12 Mine, Brunswick Mining and Smelting Corp. Ltd.
Smith, J.	May 13-16	<u>Toronto</u> - Attend the National Industrial Production and Machine Tool Show, the Coliseum, Exhibition Park.

Stefanich, W.	May 11-23	<u>Timmins</u> - Carry out dust measurements at Kidd Creek Mine, Texasgulf Canada Ltd.
Tervo, R.	Feb. 4-6 Feb. 26-27	<u>Sudbury</u> - International Nickel Company of Canada, Frood-Stobie #7 Mine, to carry out tests on modified automatic current controller for the raise borer.
	Feb. 13 Mar. 3	<u>Sudbury</u> - International Nickel Company of Canada, Frood-Stobie #7 Mine, to conduct experiments with the automatic hydraulic pressure controller on the raise borer, and to bring out the instrumentation from the raise borer site.
	Feb. 18-21	<u>Quebec City</u> - Visit the Rock Fracture Group of the Mining Research Laboratory to discuss automation of raise borers. Present a paper on underground communication methods to the executive meeting of the Quebec Metal Mining Association. <u>Ottawa</u> - Discuss projects at the Mining Research Laboratories.
	May 12-15	<u>Ottawa</u> - Discuss mining research project with the Director of CANMET. Discuss instrumentation for continuous monitoring with members of Fuels Research Laboratory. Discuss computer applications in process control with L. K. Nenonen, National Research Council.
	May 20-23	<u>Quebec City</u> - Visit Mining Research Laboratory office to examine the operation of the laboratory diamond drill under computer control and to examine the flow controller for raise borer use.
	May 28	<u>Sudbury</u> - Frood-Stobie Mine, International Nickel Company of Canada Ltd., to discuss raise boring control study with E. Bargen and to attempt to bring back to Elliot Lake the damaged instrumentation trailer previously used underground.
	June 3	<u>Sudbury</u> - International Nickel Company of Canada Ltd., Frood-Stobie Mine, to install electrical wiring and outlets in new instrumentation trailer.

Tervo, R. continued	June 12-14	<u>Ottawa</u> - To discuss with Mr. C. Mamen, the CANMET exhibit to be prepared for the Canadian Mining and Aggregate Equipment Exhibition, Toronto, Oct. 8-10/75.
	July 23-24	<u>Sudbury</u> - International Nickel Co. of Canada Ltd., to meet with Mr. W. J. Taylor to discuss air and water flow controller for a raise borer. To go underground at Frood Stobie mine to make modifications to the raise borer power supply for tests of motor current controller.
	July 29-31 Aug. 5, 6, 12, 13, 20, Sept. 3, 24, 25 Oct. 15, 16 Nov. 24, 25	<u>Sudbury</u> - International Nickel Co. of Canada Ltd., Frood-Stobie #7 Mine, to carry out tests on the raise borer motor current and hydraulic pressure controller.
	Sept. 7-9	<u>Ottawa</u> - To discuss the CANMET exhibit for the Canadian Mining and Aggregate Equipment Exhibition, with C. Mamen and P. Stevenson. To visit Mining Research Laboratories to discuss projects.
	Oct. 1-2	<u>Ottawa</u> - To attend a meeting at Geological Survey of Canada, to discuss problems of geologic storage of radioactive wastes.
	Oct. 5-7	<u>Timmings</u> - Texasgulf Canada Ltd., to discuss underground communications and monitoring of the environment. <u>Cobalt</u> - Silverfields Mine (Teck Group) to discuss underground communications problems.
	Oct. 7-11	<u>Toronto</u> - To conduct a seminar on underground communications methods at the Canadian Mining and Aggregate Equipment Exhibition, and to assist with the CANMET exhibit.
	Oct. 27-29	<u>Ottawa</u> - To attend the Canadian Nuclear Waste Disposal Review meeting at Geological Survey of Canada.
Tirrul, L.	Mar. 16-19	<u>Goderich</u> - Repair load cells on cable bolts at Sifto Salt, Domtar Chemicals Ltd.

Washington, R. A.	July 15-17	<u>Pte. Claire, P.Q.</u> - Noranda Research Centre, to study possible emanation of radon gas from uranium ore during leaching in a pilot plant circuit under study by Noranda Research.
	Aug. 17-20	<u>Cluff Lake, Sask.</u> - Amok Mines, to observe radiation measuring techniques and observations during trenching development.
	Dec. 9	<u>Toronto</u> - Conspec Controls Ltd. to review progress on Continuous Monitoring Contract No. OSQ5-0042 and to review and approve technical specifications of sensors proposed for underground installation.
Zahary, G.	Jan. 13-16	<u>North Bay</u> - Air Defense Command, to inspect rock bolting installation in underground tunnels. <u>Ottawa</u> - Attend coordinators/managers meeting at Mining Research Laboratories.
	Jan. 20-24	<u>Ottawa</u> - Attend Canadian Mineral Processors Conference and act as session chairman for the tailings revegetation session.
	Mar. 16-19	<u>Montreal</u> - Present lecture on rock mechanics and mine planning at McGill University seminar and discuss environmental research.
	Apr. 9-12	<u>Timmins</u> - Attend Sub-committee on Fill, Canadian Advisory Committee for Rock Mechanics meeting, in capacity of Secretary.
	Apr. 15-16	<u>Sudbury</u> - Attend Cambrian College Polytechnical Advisory Committee meeting.
	July 14 - Sept. 16	<u>Ottawa</u> - To participate in management training at CANMET headquarters.

Zahary, G. continued	Oct. 16-17	<u>Sudbury</u> - Laurentian University, to participate in discussions and visit experimental tailings revegetation sites.
	Oct. 24-25	<u>Toronto</u> - To discuss organization of dust research with Mines Accident Prevention Association of Ontario.
	Nov. 4-6	<u>Sudbury</u> - To attend the Environment Canada - CIM Seminar on mining effluent treatment/guidelines/regulations and to participate in meeting to discuss Environment Canada - Ontario Ministry of Environment - Atomic Energy Control Board - Elliot Lake Laboratory interests in tailings reclamation at Elliot Lake.
	Nov. 16-18	<u>Montreal</u> - to lecture at professional development seminar, McGill University. <u>Ottawa</u> - to discuss administrative organization.
	Dec. 15-18	<u>Ottawa</u> - To attend seminar on mineral reserves and discuss laboratory management.
Zawadski, W.	Feb. 3-6	<u>Timmins</u> - Texasgulf Canada Ltd. to install extensometers underground, test rock bolts, and examine open pit walls.
	Feb. 24- Mar. 24	<u>Sudbury</u> - International Nickel Company of Canada, Frood-Stobie Mine, to take stress measurements in the crown pillar.
	May 12-15 June 9-12, 23-25.	<u>Timmins</u> - Texasgulf Canada Ltd., to monitor open pit slope with laser theodolite, to take photographs of open pit slope with photo-theodolite.
	July 21-24	<u>Goderich</u> - Domtar Chemicals Ltd., Goderich Mine, to drill hole behind plates on cable bolts to try and reduce the load.
	Oct. 28-29 Dec. 18-19	<u>Sudbury</u> - International Nickel Company of Canada Ltd., Creighton Mine, to take extensometer readings and deliver diamond bits to Copper Cliff office.

FIELD WORK AND VISITS

Western Office, Calgary

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Anderson, S.	May 20-21	<u>Sparwood, B. C.</u> - To find accommodation and consult with Kaiser Resources Ltd. Chief Geologist, B. Murphy.
	June 2-30	<u>Sparwood, B. C.</u> - Geomechanics aspects of Kaiser Hydraulic Mine ground control study (surface and underground geologic mapping) - field trip continuing throughout summer.
	July 1-Aug. 15	<u>Sparwood, B. C.</u> - Continuing field trip for geomechanics aspects of Kaiser Hydraulic Mine ground control study (surface and underground geologic mapping).
Barron, K.	Jan. 13-17	<u>Ottawa, Ontario</u> - To attend Coordinators/Managers meeting at MRL.
	Feb. 26-27	<u>Edmonton, Alberta</u> - To evaluate the Syncrude Project with R. McCrossan and D. Montgomery.
	Apr. 13-15	<u>Estevan, Saskatchewan</u> - To visit Saskatchewan Power Corporation mines to gather data relevant to Saskatchewan reserves assessment program.
	Apr. 18	<u>Edmonton, Alberta</u> - To attend University of Alberta Mineral Advisory Board Meeting.
	May 30	<u>Canmore, Alberta</u> - To talk over gas problems with mine officials at Canmore Mines Ltd.
	Oct. 6-Dec. 31	<u>Ottawa, Ontario</u> - To take part in "in house" management training.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Baumgartner, P.	May 20-23	<u>Sparwood, B.C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.
	June 16-19	<u>Sparwood, B.C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.
	June 26-27	<u>Sparwood, B.C.</u> - To carry out spontaneous combustion studies at Kaiser Resources Ltd.
	June 30-July 4	<u>Grande Cache, Alberta</u> - To carry out ground control instrumentation at McIntyre Mines Ltd.
	July 23-Aug. 28	<u>Sparwood, B.C.</u> - For periodic visits to carry out field investigations for strata control research at Kaiser Resources Ltd.
Bielenstein, H. U.	Jan. 13-17	<u>Ottawa, Ontario</u> - To attend Coordinators/Managers meeting at MRL.
	Jan. 27-31	<u>Grande Cache, Alberta</u> - To check on instrumentation for subsidence measurements at McIntyre Mines Ltd.
	Feb. 23-24	<u>Ottawa, Ontario</u> - To discuss RS assessments for 1974.
	Mar. 18-22	<u>Grande Cache, Alberta</u> - To check on ground control instrumentation at McIntyre Mines Ltd.
	Apr. 10-11	<u>Edmonton, Alberta</u> - To attend a thesis defence for J. D. Hughes, MSc., Univ. of Alberta, Dept. of Geology.
	May 1	<u>Sparwood, B.C.</u> - To discuss geomechanics aspects of Kaiser Project with W. Riva and B. Murphy.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Bielenstein, H. U.	May 20-21	<u>Sparwood, B. C.</u> - To find accommodations for field crew and consult with KRL Chief Geol., B. Murphy.
	May 26-31	<u>Grande Cache, Alberta</u> - To conduct strata control instrumentation at McIntyre Mines Ltd.
	June 2-6	<u>Sparwood, B. C.</u> - Geomechanics aspects of Kaiser Hydraulic mine ground control study (surface and underground geologic mapping).
	June 30-July 4	<u>Grande Cache, Alberta</u> - To carry out ground control instrumentation at McIntyre Mines Ltd.
	July 14-18	<u>Sparwood, B. C.</u> - To visit summer students, check on their progress to date and initiate them to underground.
		<u>Cranbrook, B. C.</u> - To visit Dr. Edmunds, Cominco Exploration, to discuss work in Fernie Basin as it relates to structure and stratigraphy of the Sparwood area.
	Sept. 4	<u>Grande Cache, Alberta</u> - To inspect roof fall in No. 2 mine, McIntyre Mines Ltd.
	Sept. 24-28	<u>Ottawa, Ontario</u> - To give an invited lecture on "Coal Exploration and Open-Pit Mining" at Carleton University, Sept. 25; and to check applications for engineering positions at the Western Office; also to check on other administrative matters.
	Oct. 2	<u>Lethbridge, Alberta</u> - To attend a planning meeting at Lethbridge Community College to consider the development of a Mining Technology Program.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Bielenstein, H. U.	Oct. 16-20	<u>Grande Cache, Alberta</u> - To check on subsidence instrumentation at McIntyre Mines Ltd.
	Nov. 23-28	<u>Grande Cache, Alberta</u> - To check on ground control instrumentation at McIntyre Mines Ltd.
Chakravorty, R. N.	Jan. 2-May 29	<u>Sparwood, B. C.</u> - For periodic visits to carry out spontaneous combustion studies at Kaiser Resources Ltd.
	Mar. 18-22	<u>Grande Cache, Alberta</u> - To spot test and sample gases through downholes in #11 seam and to test infra-red thermometer for detection of heating at McIntyre Mines Ltd.
	May 30	<u>Canmore, Alberta</u> - To talk over gas problems with mine officials at Canmore Mines Ltd.
	June 14-22	<u>Toronto, Ontario</u> - To visit Analygas Systems Ltd. to check up and do performance tests on CO monitoring equipments for installation in Kaiser Resources Ltd.
	June 26-27	<u>Sparwood, B. C.</u> - To carry out spontaneous combustion studies at KRL; also to discuss spontaneous combustion problems at Fording Coal with D. Parkes, Manager Licencing, KRL.
	Aug. 6-Nov. 19	<u>Sparwood, B. C.</u> - For periodic visits to carry out spontaneous combustion studies at Kaiser Resources Ltd.
Dales, G.	May 20-21	<u>Sparwood, B. C.</u> - To find accommodation and consult with Kaiser Resources Ltd., Chief Geologist, B. Murphy.
	June 2-30	<u>Sparwood, B. C.</u> - Geomechanics aspects of Kaiser Hydraulic mine ground control study (surface and underground geologic mapping)-field trip continuing throughout summer.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Dales, G.	July 1 - Aug. 15	<u>Sparwood, B.C.</u> - For periodic visits to carry out spontaneous combustion studies at Kaiser Resources Ltd.
Fisekci, M. Y.	Jan. 27-June 30	<u>Sparwood, B.C.</u> - For periodic visits to carry out field investigations for strata control research at Kaiser Resources Ltd.
	Feb. 21	<u>Edmonton, Alberta</u> - To discuss drilling with Connors Drilling Ltd. and Nelson Machinery.
	Mar. 26	<u>Canmore, Alberta</u> - To discuss report for presentation at the 77th Annual General Meeting CIMM, Toronto, May 4-7, 1975.
	May 30	<u>Canmore, Alberta</u> - To talk over gas problems with mine officials at Canmore Mines Ltd.
	July 14-Nov. 26	<u>Sparwood, B.C.</u> - For periodic visits to carry out field investigations for strata control research at Kaiser Resources Ltd.
	Sept. 9-12	<u>Toronto, Ontario</u> - To visit J.K. Smit & Sons Diamond Products Ltd. to discuss and inspect the hydraulic drill recently developed.
		<u>Ottawa, Ontario</u> - To visit MRL Ottawa to discuss the available instruments for surface movements with G. Larocque.
		<u>Elliot Lake, Ontario</u> - To visit D. Hedley at the Elliot Lake Laboratory to investigate the calibration equipment for underground strata control instruments.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Fisekci, M. Y.	Oct. 8-10	<u>Sparwood, B.C.</u> - To check on strata control investigations at Kaiser Resources Ltd.; accompanied by F. Kapeller and G. Larocque.
		<u>Elkford, B.C.</u> - To visit Fording Coal Ltd., with F. Kapeller and G. Larocque.
Grant, F.	Jan. 16-June 19	<u>Canmore, Alberta</u> - For periodic visits to conduct roof support investigations at Canmore Mines Ltd.
	Jan. 29	<u>East Coulee, Alberta</u> - To visit Century Coals to check their methods of roof support and mine design.
	Feb. 24-29	<u>Grande Cache, Alberta</u> - To conduct strata deformation measurements and check roof support at McIntyre Mines Ltd.
	Mar. 4-5	<u>Windermere, B.C.</u> - To check on newly designed diamond drilling vehicle sponsored by MRL in Ottawa.
	Apr. 21-26	<u>Grande Cache, Alberta</u> - To read strata deformation measuring instruments and replace some instruments, McIntyre Mines Ltd.
	May 1	<u>Canmore, Alberta</u> - To check on strata control research at Canmore Mines Ltd.
	May 21	<u>Canmore, Alberta</u> - To check on strata control research at Canmore Mines Ltd.
	May 26-30	<u>Grande Cache, Alberta</u> - To check on instrumentation for ground control research at McIntyre Mines Ltd.
	June 10-12	<u>Crow's Nest Pass</u> - To visit Coleman Collieries to check on their strata support and experiments with resin roof bolts.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Grant, F.	July 23-Nov. 11	<u>Canmore, Alberta</u> - For periodic visits to investigate roof control support at Canmore Mines Ltd.
	Aug. 18-22	<u>Grande Cache, Alberta</u> - To check on strata control problems and arrange details for the next support research at McIntyre Mines Ltd.
	Oct. 6-10	<u>Canmore, Alberta</u> - To conduct roof bolt research at Canmore Mines Ltd.
	Oct. 20-24	<u>Canmore, Alberta</u> - To conduct strata control research at Canmore Mines Ltd.
	Nov. 17-28	<u>Grande Cache, Alberta</u> - To conduct strata control research at McIntyre Mines Ltd.
Livesey, D.B.	Jan. 27-31	<u>Sparwood, B.C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.
	Mar. 10-27	<u>Sparwood, B.C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.
	Aug. 26-28	<u>Sparwood, B.C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.
McLeod, D.	Jan. 29	<u>East Coulee, Alberta</u> - To visit Century Coals as part of familiarization exposure scheme for administrative staff (accompanied by F. Grant).
Tomica, J.	Apr. 13-17	<u>Estevan, Saskatchewan</u> - To visit Saskatchewan Power Corporation mines to gather data relevant to Saskatchewan reserves assessment program.
	July 7	<u>Canmore, Alberta</u> - To investigate the mining conditions at Canmore Mines Ltd.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Tomica, J.	July 14-18	<u>Sparwood, B. C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.
	Aug. 18-22	<u>Grande Cache, Alberta</u> - To visit McIntyre Mines Ltd. to become familiar with Western Canadian underground coal mining conditions.
	Sept. 13-27	<u>Germany</u> - To undertake a study tour (with L. Geller) to the labs and experimental station of Steincohlenbergbauverein and Montan - Consulting of Essen and Dortmund, W. Germany to obtain details of hydromechanical extraction and hydraulic transportation systems developed by these organizations for use in underground coal mines. Mechanical design, safety and control features, rock breakage and transportation aspects, mining methods and economic questions are to be studied in detail especially as to their applicability to Canadian conditions.
Wojtula, E.J.	Jan. 7-10	<u>Grande Cache, Alberta</u> - To install subsidence instrumentation at McIntyre Mines Ltd.
	Mar. 10-21	<u>Sparwood, B. C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.
	Apr. 21-26	<u>Grande Cache, Alberta</u> - To read strata deformation measuring instruments and replace some instruments, McIntyre Mines Ltd.
	May 26-30	<u>Grande Cache, Alberta</u> - To check instrumentation for ground control research at McIntyre Mines Ltd.
	July 14-18	<u>Sparwood, B. C.</u> - To accompany mapping crew (G. Dales and S. Anderson) underground at the Kaiser Resources hydraulic mine.

<u>Officer</u>	<u>Date</u>	<u>Purpose</u>
Wojtula, E.J.	Aug. 11-15	<u>Grande Cache, Alberta</u> - To check on ground control instrumentation at McIntyre Mines Ltd.
	Sept. 22-26	<u>Grande Cache, Alberta</u> - To install subsidence instrumentation at McIntyre Mines Ltd.
	Oct. 6-10	<u>Canmore, Alberta</u> - To conduct roof bolt research at Canmore Mines Ltd.
	Oct. 20-24	<u>Canmore, Alberta</u> - To conduct strata control research at Canmore Mines Ltd.
	Nov. 17-28	<u>Grande Cache, Alberta</u> - To conduct strata control research at McIntyre Mines Ltd.
Woolf, R.	Jan. 2-May 29	<u>Sparwood, B.C.</u> - For periodic visits to carry out spontaneous combustion studies at Kaiser Resources Ltd.
	Jan. 7-10	<u>Grande Cache, Alberta</u> - To install subsidence instrumentation at McIntyre Mines Ltd.
	Jan. 27-May 23	<u>Sparwood, B.C.</u> - For periodic visits to carry out field investigations for strata control research at Kaiser Resources Ltd.
	June 14-22	<u>Toronto, Ontario</u> - To visit Analygas Systems Ltd. to check up and do performance tests on CO monitoring equipment for installation in Kaiser Resources Ltd.
	Aug. 6-Nov. 19	<u>Sparwood, B.C.</u> - For periodic visits to carry out spontaneous combustion studies at Kaiser Resources Ltd.
	Aug. 25-28	<u>Sparwood, B.C.</u> - To carry out field investigations for strata control research at Kaiser Resources Ltd.

