A Study of
Claiming and Surveying Procedures
in Relation to
Mineral (Hardrock) Properties in Canada

Don. W. Thomson
LL.B., F.R.G.S., LL.D.

Final Edition Published by
Surveys and Mapping Branch
Department of Energy, Mines and Resources
Ottawa.
August 1971

A STUDY OF
CLAIMING AND SURVEYING PROCEDURES
IN RELATION TO
MINERAL (HARDROCK) PROPERTIES IN CANADA

by

Don W. Thomson
LL.B., F.R.G.S., LL.D.

Prepared for the Canadian Council on Cadastral Surveys and for the National Advisory Committee on Control Surveys and Mapping.

FINAL EDITION Published by the Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa, August, 1971.

PRICE $2.00

TABLE OF CONTENTS

Table of Contents (Continued)

REVISION NOTE

The only revisions made in the text of the preliminary version of this Report and contained in this Final Edition are to be found under the headings Legal and Statutory (pp. 9 and 12); Cartographic Considerations (pp. 15, 16 and 17); and New Brunswick (pp. 67, 68 and 69).

LIST OF ILLUSTRATIONS

PREFACE

Dr. Don W. Thomson, author of *Men and Meridians*, is well qualified to undertake this study (Claiming and Surveying Procedures in Canada) being a graduate in Law from the University of Alberta and also well known to the Canadian survey fraternity.

It is gratifying to be able to report to the National Advisory Committee on Control Surveys and Mapping that this difficult assignment has been completed and to be able to present it for consideration at the Committee's next meeting. I am sure that the Committee members will agree that Dr. Thomson has presented the significant information in a logical form that makes for easy reading. The author has been most thorough in his research and addressed himself to this task with his usual enthusiasm.

S.G. Gamble,
Director,
Surveys and Mapping Branch.

PART 1

NATIONAL PERSPECTIVE

FRAME OF REFERENCE

The objective of this inquiry is to study the structure of statute laws and regulations in Canada, federal and provincial, related to the surveying of mineral properties (prior to actual mining operations) for the purpose of drawing attention to any inconsistencies, needless duplications, or unsuitabilities in the provision or application of these rules, conditions that create special problems for surveyors in the field: to ascertain to what extent uniformity can be attained throughout all the jurisdictions of Canada in this particular legal and administrative realm and, on the basis of assembled facts, to suggest what can be done to alleviate, if not remove, these special problems through the adoption of more efficient, more expeditious, less time-consuming and, possibly, less costly methods of identifying a mineral claim or claims and of acquiring mineral rights thereon.

Staking and claiming processes as well as mineral rights leasing practices are so closely allied with surveying procedures as applied to mineral properties that any effective study of the latter must perforce include a careful scrutiny of their related activities.

It has been considered advisable to divide the report resulting from this study into at least two parts: the first part consisting, in the main, of factual material assembled in relation to metallic minerals (hardrock mining) and the second part containing suggestions or recommendations based upon the ascertained facts.

PRELIMINARY

At the 1966, 1967 and 1968 annual conferences of the Ministers of Mines of the provinces there were discussions concerning the adoption of a more efficient method of identifying mineral properties in Canada for the purposes of recording and working claims thereon as well as concerning the attainment of a greater degree of uniformity of laws and regulations across Canada in relation to the acquisition of mineral rights.

In 1969 a coincidence occurred when in the same city (Toronto) and within a period of ten days in the same month (September) two organizations of a nationally representative character met and passed, among other business considered, similar motions on the themes mentioned in the first paragraph, each body being unaware of the other's intentions in this regard. When the Conference of the Provincial Ministers of Mines concluded on September 17, 1969, the proceedings included a report of Committee No. 2 recommending "the setting up of an ad hoc committee composed of representatives of the provincial governments and the mining industry to study the various mining legislations and regulations, also that the ad hoc committee write a document making specific recommendations to establish uniformity in the above-mentioned fields and to report back to the Committee at the next Mines Ministers Conference."

On September 23, 1969, the matter of improving surveying procedures in regard to mineral properties was raised during the meeting in Toronto of the Canadian Advisory Council on Cadastral Surveys. The Council passed a motion that a select committee of its members from Manitoba, Ontario, Quebec, British Columbia and Nova Scotia as well as from Canada (federal) be asked to report to the Advisory Council on this matter. On September 26 the select committee reported that "the suggestion made in Council on September 25, 1969, that the National Advisory Committee on Control Surveys and Mapping be asked to carry out a nation-wide study of mineral claim surveying and the related legislation was considered. It was agreed that while no particular problems were evident in some areas (provincial) circumstances could very likely be improved and that such a study is justified. Mr. Gauer (Manitoba) stressed his concern that requirements for the alienation of mineral and surface rights were generally dissociated, with the result that some areas had, in effect, to be surveyed twice."

Subsequently, in consequence of this report, the Director of the Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa, invited me on the conclusion of my work on "Men and Meridians", a three-volume history of surveying and mapping in Canada, to undertake the

special study mentioned in the motion of September 26. Soon after my acceptance of this task in late October, 1969, the similarity of the motions of September 17 and September 26 was discovered. It was the view of the surveyors that the results of my study could be offered to the ad hoc committee of the Conference of Mines Ministers, supplementing the work of that body and, at the same time, discharging the responsibility undertaken at the request of the National Advisory Committee on Control Surveys and Mapping.

On December 31, 1969, R.G. Code, Surveyor General of Ontario, retiring chairman of the Advisory Council on Cadastral Surveys, wrote to Dr. P.E. Auger, Deputy Minister of Mines, Department of Natural Resources, Quebec, in his capacity of co-chairman of Committee No. 2 (Conference of Provincial Mines Ministers) advising him of developments in the meetings of the surveyors of Toronto, of their deliberations on the matter of the special study, and expressing the hope that the Thomson report would prove to be useful to the ad hoc committee as well as to the Canadian Advisory Council on Cadastral Surveys (Select Committee on Mining Claims).

Early in January, 1970, I visited Dr. P.E. Grenier, Department of Natural Resources, Quebec, co-chairman with Dr. Auger of the above-mentioned Mines Ministers Conference committee, in order to aid in clarifying the situation that had arisen and in the hope of removing needless duplication in the two studies then under way. Dr. Grenier looked with favour on the course of action proposed by Mr. Code and felt that Dr. Auger would also be agreeable. In mid-February, 1970, a letter was addressed by Dr. Grenier to the Conference authorities in each of the provinces in which he referred, among other matters, to the proposed dual-purpose nature of this study, and asking for comments. By mid-March, 1970, no objections to the proposal had been received.

It is hoped, therefore, that the results of this study will serve to stimulate discussion on the subject of this inquiry and will prove useful to policy-makers and departmental administrators directly concerned with mineral industry development in this country as well as to prospectors, surveyors, mappers and map-producing agencies in Canada.

"As our capital and population increase there cannot be a doubt that the mineral treasures brought up from the bowels of the earth will contribute a much larger share than heretofore to the growing prosperity of these Provinces, and will furnish remunerative employment to a large body of our people." Editorial, The Daily Globe (Toronto), July 1, 1867.

The significance of this study is underscored by the general acknowledgement that mining is one of the major pace-setting industries for the entire Canadian economy. The importance of mining in the industrial life of Canada is evident in the preliminary figures issued by the Dominion Bureau of Statistics and published in the February, 1970 issue of the Canadian Mining Journal, vol. 91, no. 2, figures relating to the calendar year 1969. These statistics indicate that the value of Canadian mineral production for last year is approaching the five billion dollar level. The totals, subject to final revision, for each of the provinces and territories, are as follows:

British Columbia	$ 422.8	Ontario	$1214.5
Yukon Territory	37.7	Quebec	720.1
Northwest Territories	116.5	New Brunswick	98.4
Alberta	1193.3	Nova Scotia & P.E.I.	21.6
Saskatchewan	334.8	Newfoundland & Labrador	239.1
Manitoba	245.6		$4664.4 million.

In Canada, generally, because mining laws and regulations in this country are subject to frequent amendment, such provisions tend to be in a constant state of flux. In a report of this nature and scope it is impossible, therefore, to keep fully up to date on all revisions and developments concerning rules relating to the acquisition and surveying of mineral properties. Details of statutory requirements by which mineral rights may be acquired and kept in good standing vary from jurisdiction to jurisdiction. Mining laws in each undergo frequent amendments, revisions and consolidations. More often than not the bald words of any amendment made to the mining law of any particular jurisdiction fail to afford a hint of the reasons underlying the change being made. Frequently the researcher in this field would be immensely aided in understanding, in historical terms, the course of development of mining laws and regulations in this country if some light had been thrown by legislators on the reasons for important changes in administrative policies and practices. But it is to be hoped that the findings and

conclusions of this and any subsequent report on this subject will prove to be sufficiently up to date and comprehensive enough to permit sound conclusions to be drawn and to provide guidance in arriving at the best possible policies to follow in the future in this significant realm of national activity.

Any individual over 18 years of age, by complying with statutory requirements, and any company authorized to do business in Canada may acquire rights to Crown-owned minerals. These rights are granted under permits, licences and leases. Minerals are now generally regarded as separate from surface estate and thus rights to minerals are now granted in all parts of Canada, independently of surface rights.

In Canada the grub-staked prospector of the traditional type has been a highly individualistic enterpriser travelling alone and often packing food and other supplies on his back and with a pick as his main item of equipment. This picture has changed somewhat in recent years. Today exploration for minerals in this country has become, in large measure, a team effort. True, individuals continue to search for, and find, ore bodies of importance. Much more frequently the most significant prospecting is being performed by groups of corporation-financed, highly trained mine-hunters, travelling about in aircraft and employing instruments and methods that are becoming increasingly sophisticated. Commonly the prospector of today is a university graduate, assisted by a considerable staff in his home office.

It is therefore not too surprising that this study should reveal that in Canada the total number of prospectors of the traditional type, persons mainly dependent upon mineral prospecting for their livelihood, is absolutely, as well as relatively, small. In some parts of Canada, notably in the Yukon Territory, there are in addition a fairly large number of casual or "week-end" prospectors. In 1967, for instance, a total of only 26 prospectors in the Yukon and 41 in the Northwest Territories received financial assistance in their field searches under the federal Prospectors Assistance Program as administered by local assistance boards. (See I.A. and N.D. Press Release 1-6556).

Thus in the Canada of the 1970's it appears that fewer and fewer individuals, by chopping on a bit of outcrop, discover workable mineral deposits. On the other hand, each succeeding year an increasing proportion of new "finds" are revealed through the use of airborne instruments designed to measure the earth's magnetism, gravity, radioactivity and other factors pertaining to specific areas under examination. Turbo-prop aircraft fitted with electromagnetic and magnetic equipment are now used frequently on geophysical surveys. The airborne laser beam equipment is also coming into use in establishing precise control points in the surveying of mineral properties in some parts of Canada. Pairs of television sets along with helicopters are also in use for similar purposes.

In fact, more and more often the use of aircraft enables exploration teams to probe our hinterlands effectively wherever terrain makes ground examination particularly difficult, time-consuming, and costly. Computers are being employed in head offices for the storage and retrieval of geological and other survey data. Some land surveyors, specializing in the measuring of mineral properties, and operating out of Yellowknife, are in constant, immediate touch with their head offices by means of telex equipment.

All of this progress is a far cry from times when solitary prospectors and adventuresome surveyors worked in conditions of extreme personal hardship in wilderness areas with only the most elementary instruments and knowledge of the region to guide them.

But can anyone be certain that the individual prospector of the traditional type is altogether outmoded? Men in the mining industry in British Columbia and the Yukon maintain that he will always be a key man in the search for mineral wealth in those regions, indispensable because it is only the lone prospector "searching in every nook and cranny" of those mountainous regions who can produce significant results. But the fact remains that there are, in all of Canada, few of these types still active on a year-round basis. In a number of cases even these lone types are on retainer to large mining concerns. Nor of those who do remain in the field, are there many who make a big find. But it is the occasional discovery of

great value, with a fortune resulting for the prospector, that continues to inspire other men in following this calling. But the big discovery, as exemplified in the following Canadian Press news item of June 27, 1970, is the exception rather than the rule:

SHY PROSPECTOR QUITS CEREMONY

Peachland, B.C. (CP)

Bob Bechtel of Penticton, B.C. disappeared moments before he was to press a button setting off sirens at the $62,300,000.00 open-pit Brenda copper-molybendum mine, 16 miles northeast of this Okanagan Valley resort community. Brenda President B.O. Bryndson of Vancouver observed that Mr. Bechtel "appears to have jumped into his truck and gone off. He is a very shy person."

It was almost exactly 15 years ago to the day when the prospector led Mr. Bryndson to a hilltop to show him the copper deposits that led to the development of the property. Now 53, and $750,000.00 richer from shares he collected in Brenda, Mr. Bechtel discovered the claims while prospecting on a day off from his job as a $350.00-a-month bus mechanic.

LEGAL AND STATUTORY

Under Section 109 of Canada's constitution, the British North America Act, full control over mineral resources within each of the four original provinces was given to the government of that province. This principle has been followed in respect of each of the other six provinces, although that measure of control did not take effect uniformly at the time of their entry into Confederation.

Section 109 provides: "All Lands, Mines, Minerals and Royalties belonging to the several Provinces of Canada, Nova Scotia and New Brunswick at the Union, and all Sums then due or payable for such Lands, Mines, Minerals, or Royalties, shall belong to the several Provinces of Ontario, Quebec, Nova Scotia and New Brunswick in which the same are situate or arise, subject to any Trusts existing in respect thereof, and to any Interest other than that of the Province of the same."

Thus the laws and regulations now in effect and applicable to the disposition of mineral rights, and other direct controls over mineral resources are those of the province in which such resources lie, with certain minor exceptions, or of the Government of Canada if the resources lie within the Yukon Territory, Northwest Territories, or within National Parks or Indian Reserves. In all provinces, however, some mineral rights are owned by individuals or firms on a freehold basis.

Statutory requirements by which mineral rights can be acquired and maintained through terminable grants, vary in details from province to province and as between the two territories. Such laws and regulations now in force are emanations of the provinces, with minor exceptions, or of Crown-Canada (the Crown in the right of Canada) in relation to mineral resources found in the Yukon Territory, in the Northwest Territories, and within National Parks and Indian Reserves. Mining laws and regulations were substantially similar in the three provinces of the western interior as well as in the two territories until the transfer of natural resources took place from the federal administration to those provinces in 1930. Since 1930, however, certain disparities between the rules as enforced by the various jurisdictions have appeared.

Under the Common Law of England, applicable also in a substantial part of Canada, a prospector enjoys a right of entry on another's property to search for and recover minerals e.g. "to take, have, and carry away..." without, in so doing, incurring any of the penalties of trespass. In Ontario (Mining Act, Sec. 1 (12)) this right of entry is described as that of "winning, opening up, or proving any mineral or ore body..." In Saskatchewan a deputy minister described this function as "the right to work, win and carry away..." In British Columbia (Mining Act, Sec. 21) this right is described as that of "winning and getting from and out of each claim..." In the Province of Quebec (Mining Act, Sec. 1 (12)) it is "the right to explore for, work and use..."

In some parts of Canada this prospector's right of entry and of use has undergone considerable qualification, however. In Alberta, for example,

there is now a modified version of the English Common Law concept of this right. The prospector now obtains entry on land not his own, only by consent of the owner and occupant or by edict of the provincial Arbitration Board. As early as 1952, under ch. 79, the Right of Entry Arbitration Act,* Sec. 12, it was provided that no operator (person or firm having the right to a mineral or the right to work the same) has a right of entry, user or taking of the surface of any land for the removal of minerals and any related activities "until the operator has obtained the consent of the owner of the surface... and the occupant thereof, or has become entitled to entry by reason of an order of the Board (of Arbitration)." In Alberta the statutory basis for modifying the Common Law concept is Sec. 5, ch. 259, the Public Lands Act, a provision stating that "There is reserved hereby to the Crown out of every disposition of public lands under this Act.. all mines and minerals, whether precious or base, <u>together with the right to enter, locate and prospect for minerals</u>..."

In New Brunswick, for example, the right of entry and development is curbed to the extent that staking, claiming, and recording does not confer any authorization to damage certain property entered upon, such as land of cities and towns, land used for railway purposes, cultivated land, land surrounding buildings, and highways (Sect. 11(2)). Until a mining licence or lease is issued to a prospector he remains a "tenant at will" of the Crown in regard to the mining claim (Sec. 38, Mining Act of N.B.) and "shall use the lands in such manner as will be least injurious to the owners and occupants." (Sec. 75)

In Canada, in the course of the 20th century to date, relatively few cases of litigation arising out of disputes over staking, claiming, recording, and surveying of mineral properties have been the subject of reported judicial decisions. This has been so, even in provinces in which special mining courts or judges, appointed by provincial governments, have functioned. Lack of reported litigation in this field of jurisprudence may be the consequence of the normally high quality of surveying of mineral properties in this country, to the fact that some cases have been settled out of court, or to the precision and firmness as well as perception with which judges

* Now R.S.A., 1955, ch. 290.

generally have interpreted acts and regulations in their application to activities of the mining industry in this country, especially in the early stages of the development of Canadian natural resources.

In 1904, for example, the Supreme Court of Canada (36 S.C.R., p. 622), in the case of Docksteader v. Clark, laid down certain fundamental principles of Canadian mining jurisprudence. There were references in the judgments to "senior" and "junior" mining locations and it soon became evident that, in law, mineral property location would not necessarily be invalidated if, in the process, there should occur an overlapping of a previously staked or senior location. Applicants would be entitled, in spite of that overlapping, to a certificate of improvements on the undisputed remainder.

In the same case, in regard to procedure in recording mineral claims, it was ruled that the form of affidavit employed requires from the applicant only the statement that "to the best of my knowledge and belief" the ground contained within the staked boundaries of his claim is not occupied by another applicant. Legislatures and courts in Canada have recognized the existence of peculiar difficulties involved in a proper and accurate staking of some claims, especially in rugged and densely wooded areas. Judges interpreted statutes establishing procedures in these matters as intending to make reasonable allowances in favor of an applicant who has been operating in wilderness country without benefit of any special training in the arts of surveying or in the use of measuring or direction-finding instruments. According to a Supreme Court of Canada decision in Callahan v. Coplen (S.C.R. 1899-1900, vol. 30, p. 555) "The pioneer prospector is neither a lawyer nor a surveyor. Neither mathematical precision as to measurement nor technical accuracy of expression (description) is either contemplated or required."

Decisions in the Docksteader v. Clark case and the case of Re Sinclair (Ontario Mining Commissioner's Cases, S. Price, 1908, p. 179) underscored the tendency of Canadian courts to rule that real discoveries of valuable minerals, rather than revelations of small flaws or defects in staking and filing claims relating to same should be rewarded by grants of land on which

discoveries had been made. In other words, the courts of Canada have exercised, generally, a measure of leniency whenever there was strong evidence of a genuine effort by the claimant to comply in substance with pertinent laws and regulations, even if there should be a failure to observe minor details in such regulations, such as the rule requiring corner posts to be stakes of certain specified dimensions. Nevertheless any wilful "claim-jumping" or obvious attempt to mislead other prospectors have not been tolerated by the courts and have resulted in the invalidation of the offender's claims. As was stated by the Appeal Court of British Columbia in Victor et al v. Butler (Martin's Mining Cases, vol. 1, p. 438) "In this country the spirit of the administration of the law relating to mining prospectors is to favor the title of the senior grantee. The only alternative would be to foster litigation to encourage "Claim-jumping"."

In Callahan v. Coplen, to which reference has been made, the court stated, "The scheme of the (B.C.) Act is plain. After discovery of a mineral, non-compliance with formalities (unless calculated to mislead) shall not invalidate his title. After the recording of his assessment work, all irregularities of titles are cured. But in this case where the statute calls for only 'Approximate compass bearing' and the inscription on the stake is actually 80 degrees in error... this is of a character calculated to mislead.. and the irregularity cannot be healed by the resort to any remedial clause."

In the 1958 case of Dark No. 1 v. Northrup No. 1 involving judicial interpretation of certain of the Northwest Territories Quartz Mining Act regulations, Mr. Justice J.H. Sissons at Yellowknife observed that in locating a mineral claim, six steps are required under relevant regulations, namely:

1. Entry on the parcel of land.
2. Locating of parcel on the ground.
3. Marking of same by staking.
4. Inscribing and tagging of posts.
5. Cutting (or blazing) of boundary lines.
6. Negativing of any prior adverse claim.

Also in the case of Re Sinclair the judgment rules against efforts by surveyors of mineral properties, who are doing such work for a certain company, from acquiring in their own name any additional and adjoining claims in derogation of their client's interest.

A recent case which has emphasized the value of reliable mapping is that of Leitch Gold Mines Limited et al v. Texas Gulf Sulphur Inc. et al. Ontario Reports 1969, v. 1, p. 469.

If one keeps in perspective the whole body of reported court decisions in Canada in the realm of staking, claiming, recording, and surveying, one is impressed by the relative scarcity in the law reports of serious legal conflicts over boundaries of mineral properties or of cases involving the quality of surveying of such properties. Though a feeling persists in some quarters of the industry that courts have shown too much leniency towards those with "honest intent" not complying in all respects with laws and regulations applicable to the acquisition of mineral rights, nevertheless the principles of equity and fair play as between individuals and between large firms and individuals, that have been applied by the courts seem, in the main, to be respected and accepted.

PETROLEUM AND NATURAL GAS: LOCATION AND EXPLORATION PROCEDURES

In the northern territories and in several of the provinces map selection of petroleum and natural gas properties is in effect. These systems, which dispense with ground staking as a location method, have been in operation in some jurisdictions of Canada for some years and, from all reports, serve satisfactorily in promoting efficiently the development of such mineral resources. The question is being asked by proponents of map selection - if the system functions well in regard to exploration for petroleum and natural gas, why cannot the same location system apply to hardrock mineral resources?

In summary the principal features of these above-mentioned map selection systems, gradually being extended across the various jurisdictions of Canada, are as follows:

YUKON TERRITORY AND THE NORTHWEST TERRITORIES

By regulations under the Territorial Lands Act and the Public Lands Grants Act a grid area system is in effect in these territories as a basis for allocation of oil and natural gas rights. Each grid area is divided into sections and these, in turn, are subdivided into units. Each section is composed of 16 units, formed by straight lines drawn to divide opposite boundaries, on the map, into four equal parts. Each unit is designated by a letter of the alphabet according to a regular pattern. At the centre of each unit is a 600-foot square that forms the target area for a development well.

In each grid area sections are numbered from one upwards following a uniform pattern but areas vary from 60 to 100 sections, depending upon the particular latitude zone in which the area falls. A grid area, as defined in the regulations, is a quadrilateral bounded on the east-west by meridians and on the north-south by chords to parallels of latitude. The latitudes used are multiples of 10 minutes. South of 70 degrees latitude the meridional boundaries of the grid area are multiples of 15 minutes. North of 70 degrees latitude multiples are of 30 minutes. Reference to a particular grid area is made by quoting the latitude and longitude of its northeast corner.

The system, devised to provide for the orderly development of these resources, provides a practical framework on which to base legal and administrative functions relating to descriptions of permits and leases as well as control over well spacing, among other matters.

Development accordingly takes place in the exploratory stage of the acquisition of rights to oil and natural gas without the necessity of staking on the ground and without any loss of security of any such rights belonging to developers. Legal surveys of properties occur when the production stage is reached.

The grid area description is based on a regular geographic system and so boundaries of holdings may be simply superimposed upon a topographic map or hydrographic chart to an accuracy that is usually adequate for this work.

In Alberta, under the petroleum and natural gas laws and regulations, the maximum area of a location or tract in the form of a square is 9 sections (5,760 acres). When the shape of the tract is a rectangle the maximum area is 8 sections (5,120 acres) not to exceed 4 sections in length. The minimum area of a tract is 160 acres. But no staking on the ground is involved, i.e. surface and mineral rights are congruent.

In Ontario, in regard to petroleum and natural gas exploration and in that part of the province north of 51 degrees latitude the region is divided into a grid area patterned on the federal system in the northern territories, with 100 numbered sections in a grid area. This system has been provided under the terms of Ontario Regulation 159/70 dated January, 1970.

In British Columbia permits are issued over grid areas or for a block or blocks of land in a grid area. A grid area consists of 15 minutes of latitude and 15 minutes of longitude and is divided into 6 blocks of approximately equal area. A maximum size permit would cover 125,366 acres. A minimum size permit would cover one block of 16,021 acres.

In Nova Scotia the areas granted for petroleum and natural gas development by licence or by lease are based on the National Topographic Series of maps, the basic unit consisting of 18 mining tracts (18 square miles). Each licence may contain 1 to 24 reservations. A reservation signifies each parcel of land contained in one-sixth of a reference map and comprising 18 mining tracts. The boundaries of each reservation consist of the length of 6 mining tracts running east-west: by the length of 3 mining tracts running north-south.

A reference map means one-quarter standard map sheet consisting of 108 contiguous mining tracts of approximately one square mile each. No ground staking is required under this system.

LOCATION OF OIL AND MINERAL RESOURCES OFFSHORE FROM CANADA'S SEA COASTS

In undertaking surveys of Canada Lands offshore from our ocean coasts for purposes of petroleum resources development, boundaries of lease or permit holdings are defined in terms of geographical coordinates. The need

for legal monumentation, a formidable problem in offshore regions, is less critical in preliminary or exploratory stages. Only at the development (production) stage would a legal survey of an area be required in order to determine the actual area for which recovery rights are held.

Nevertheless it appears that in offshore regions the traditional system of ground staking of hardrock mineral claims still applies despite its impracticality under such conditions. The submerged claims staking procedures and resulting survey requirements are contained in the Canada Mining Regulations. These are quite unworkable in the offshore regions of this country for the orderly development of offshore hardrock minerals.

The techniques that have been applied in the location and recovery of offshore oil deposits, including locations by means of geographical coordinates, are likely to be applied in time to certain other minerals, such as sulphur, that may be available in commercial quantities in similar submerged regions.

Two Ottawa departments of government share administration of the federal interest in Canada's offshore mineral resources. Generally, our east and west coasts, Hudson Bay and Hudson Strait regions in this respect come under the Department of Energy, Mines and Resources (Resources Administration Division). The administration of minerals underlying the territorial waters of the Arctic Offshore is the responsibility of the Department of Indian Affairs and Northern Development (Oil and Mineral Division).

CARTOGRAPHIC CONSIDERATIONS

Among those interviewed on the subject of the unit size of a mineral claim as well as the scale of map most suitable for selection of mineral claims by map, various views were expressed. The consensus is that a 1,500-foot square mineral claim on a 1:50,000 scale map would be a workable combination.

In the foreseeable future in Canada the largest scale, federally-produced map that is being progressively and regularly improved is that

printed at the scale of 1:50,000. Work on the 1:50,000 programme is progressing at an annual rate of about 300 maps and at this rate coverage will be complete by 1995.

As far as can be foreseen federal maps at scales smaller than 1:50,000 appear to be impractical for identification of properties by map as a substitute for staking on the ground. The size of a 1,500-ft. square-shaped mineral claim (51.65 acres) on a map at 1:50,000 scale would be a square with each side 0.36 inches in length. On a 1:250,000 scale map a claim of the same dimension would appear as a square with each side 0.07 inches in length.

If the size of a standard mineral claim in the ground were to be enlarged by law to, say, 160 acres (a square being one-half to the side) in all jurisdictions of Canada, then the map depiction error that is intrinsic in any cartographic portrayal of the area of the property would proportionately be less significant. That would be the only cartographic result accomplished by such a statutory step.

The accuracy of reading mineral claim boundaries on a map is dependent on at least two factors:

(a) the intrinsic accuracy of the map being used, which is chiefly dependent upon the accuracy of the field survey and aerotriangulation; the quality of the cartographic skill involved in the production of the map.

(b) the ability to depict the boundary on the map in the correct relationship to other map features.

With regard to (a) the horizontal accuracy of the 1:50,000 National Map Series of Canada is given in the following table:

Circular Map Accuracy Standard (CMAS)

Planimetric positions of 90% of well defined features measured from the map (except those unavoidably displaced by exaggerated symbolization) will fall within the limits set out in the table on page 17, relative to their true planimetric positions as referred to the geographic graticule or grid of map:

	1:50,000	Rating
1	25 metres	A
2	50 "	B
3	100 "	C
4	More than 100 metres	D

With regard to (b) the ability will be dependent upon the incidence and nature of the depicted features and on the competence of the map reader. No statistical value can be given which would have general application but, assuming that all the surrounding features have been located within the quoted map accuracy, points on the boundary lines should also be located to an accuracy which lies within the circle of map accuracy.

YUKON TERRITORY

Staking and Claim-Marking System	:	2-post. Each post is placed at extremity of location line which may trend in any direction but should not exceed 1,500 feet in length. Distance to end of claims to left and right of location line not to exceed 1,500 feet and said distance to be marked on No. 1 post. Location line to be blazed or, in barren areas, mounded. Staking by proxy ("attorney") is permitted.
Maximum of claims per year per person	:	no person is entitled to locate "more than seven claims in the aggregate within a distance of ten miles from any other mineral claims located by him...in the same period (12 months)."
Maximum no. of claims for grouping	:	16 contiguous claims (Sec. 52 (1)).*
Dimensions of a full-size claim	:	1,500-foot-long-sides, at right angles except where a previously located claim forms one or more of the boundaries. Claim to contain 51.65 acres. (Sec. 29 (1)).*
Perimeter surveying	:	not authorized.
Fixing of metal tags	:	Tags to be affixed "as soon as reasonably possible" after recording of a claim (Sec. 45).*
Survey before leasing	:	Survey required prior to issue of Certificate of Improvements which precedes leasing.
Term of lease	:	21 years renewable.

* Yukon Quartz Mining Act, R.S. ch. 217, 1952.

HISTORICAL SKETCH

As early as 1887 it was estimated that 250 prospectors and miners were active in the Yukon Territory. In 1896 news of a rich gold strike on Klondike Creek caused the world-famous, record-breaking rush to the Dawson area. One 4-acre Creek claim (No. 16 Eldorado) alone produced $1,500,000.00 in gold. In the winter of 1888-9 almost every creek within 100 miles of Dawson was staked from mouth to source. Now, more than 80 years later, after prolonged large-scale dredging operations, Bonanza Creek gravel bars are still being picked over by "week-end" prospectors. But now as well, overhead, a new type of airborne prospector operates, equipped with sophisticated electronic gear and special cameras, examining the wilderness in an unceasing search for valuable minerals. A Northern Roads program, a Northern Mineral Exploration Assistance program, and a Prospector's Assistance Program, all under federal government auspices serve to bolster that type of search, the latter item of legislation providing grants to individuals up to $900 per year to assist in outfitting and transportation costs.

• • •

The law concerning the size of each mineral claim and regulating the staking and tagging procedures under the 2-post system has continued, in the main, to govern the acquisition of mineral rights since the Gold Rush days. But at this stage in the history of mineral development in the Yukon there are growing indications of impending changes in the rules. The present period, in fact, appears to be one of transition from the long-standing provisions of the Yukon Quartz Mining Act on the one hand, and, on the other, to a new measure apparently now under study by federal officials, if not by the federal cabinet, prior to its introduction in Parliament in bill form. The prospect of amendments to existing mining laws in the Yukon Territory coincides with a noticeable upsurge of activity in prospecting and mineral development generally in the Yukon, especially in regard to base metals. In the fiscal year 1968-69, for example, a total of less than 4,000 mineral claims were recorded in the Yukon whereas, considerably before the end of the fiscal year 1969-70, a total of more than 13,000 claims had already been recorded.

Because the two northern territories of Canada have not yet attained legal status as provinces, the Government of Canada has vested in the federal Department of Indian Affairs and Northern Development the responsibility to administer all rights to explore for minerals, to acquire rights to mineral properties, and to extract minerals therefrom.

The Yukon Quartz Mining Act may be unique in as much as there is, as yet, no provision for the establishment of regulations under its authority. It is possible that under proposed new legislation this situation will be remedied and that more appropriate and more significant forms of documents required by law in this field will be forthcoming also. The Certificate of Improvements (see Act, Form F. Schedule One), for example, is now considered in some quarters, to be a redundant document.

Prior to the 1927 amendments to the Yukon Quartz Mining Act the Certificate of Improvements did possess special meaning in the claiming procedure but does not seem so relevant now (see Sec. 64). As matters now stand, however, the issuance of this certificate marks the final step in procedure leading to the grant of a lease to the property to which the document refers.

Certain other legal requirements have likewise become more or less obsolete in the administration of the Act. In earlier days in the Yukon, for instance, miners usually resided nearby their mineral claims and it was not a hardship or added expense for them to arrange for the posting of a notice of survey on the site of a claim, as required by Sec. 80 (1) of the Act. But this continuing Section, now no longer necessary, is quite expensive at present to implement in areas difficult of access.

Although there are provisions in the Yukon Quartz Mining Act for the issue of a Certificate of Work and a Certificate of Improvements there are no references to licences or permits, and in the Territory any person 18 years or older may in person or by an attorney stake a claim. In the case of iron and mica properties the side of a claim should not exceed 2,640 feet instead of the otherwise stated length of 1,500 feet.

Under existing conditions the strict restrictions on the total number of claims that can be filed upon in a year in the Yukon (8) and the number that may be grouped, 16 contiguous, constitute a hindrance to mineral development in the Territory, in the view of many knowledgeable persons concerned with this type of activity.

In comparison with the 4-post system of marking claims it is true that under the 2-post system the prospector need carry or make half the total number of stakes for marking his claims and this is a consideration when travelling on foot in rugged terrain. But the task is not in any way lightened, however, for the land surveyor who is called upon to monument (place permanent markers) no matter how difficult the terrain, a job often involving increased surveying time and costs. Administrative costs are also greater under the 2-post system which appears to be particularly productive of gores, overlapping of claims, open ground and fractions. An additional disadvantage of the system in the Yukon is that perimeter surveying has not thus far been authorized. In the Yukon and in B.C., however, general support for the continuance of the 2-post system remains strong. In the case of the Territory particularly it is a system that has come to be an integral part of the history and life of its citizens.

The recorded owner of a mineral claim may be required to have the claim surveyed. The cost of the survey is accepted as representation (assessment) work on the claim for the year in which the survey is made.

A practice has grown up, acceptable thus far officially, of "swivel grouping" which has the effect of evading the 16-claims grouping limitation and under which practice a variety of combinations of claims based on work done on a single claim are worked out in meeting the assessment work requirements. (Sec. 52 (1)).

There are relatively few full-time prospectors in the Yukon Territory but many casual or "week-end" types, also promoters.

There are some complaints about the strictness of rules surrounding the giving of notice of a survey of a mineral property as compared with the

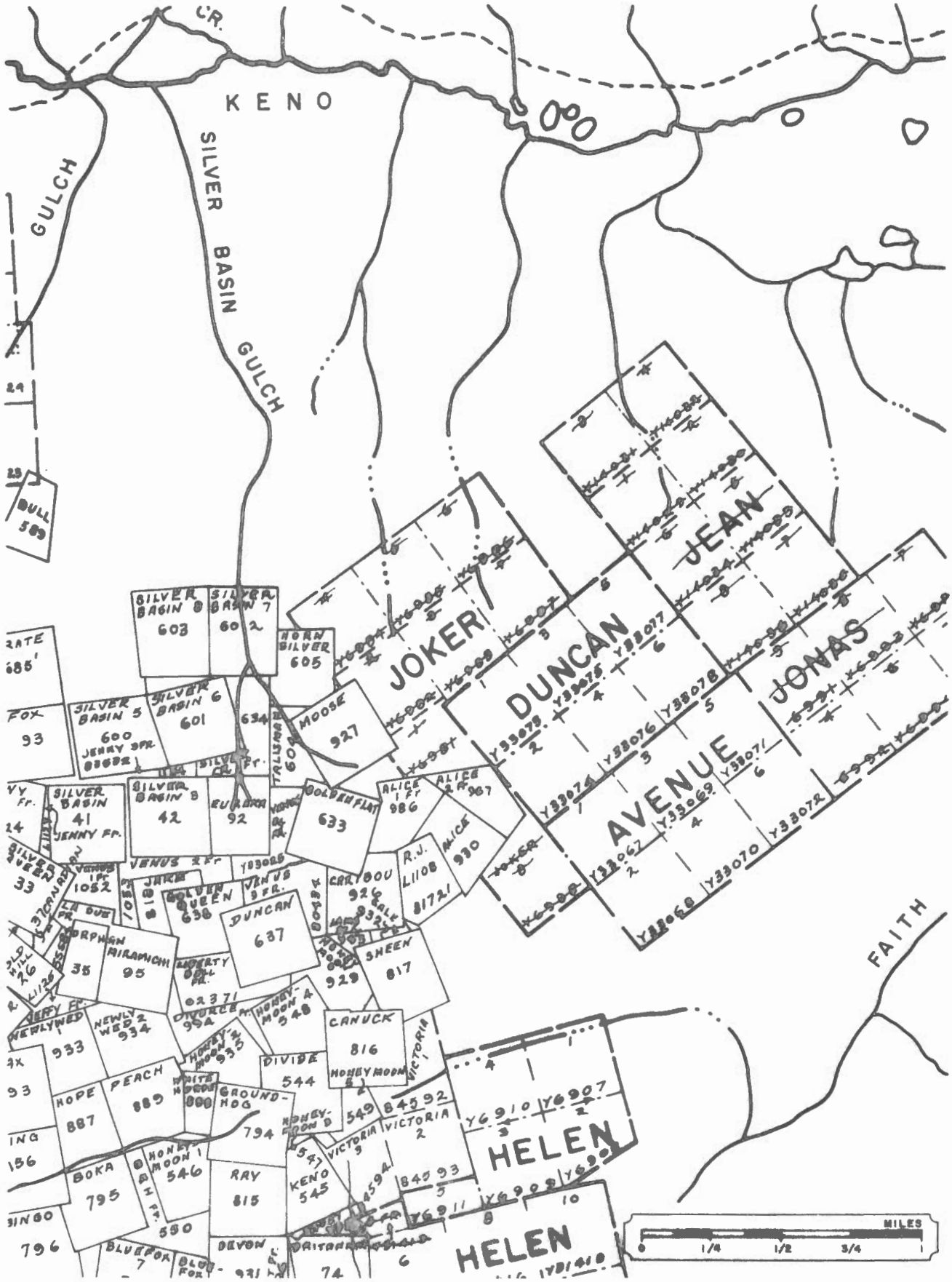
relative ease of surveying residential lots or business properties. But because rights to minerals are established on a claiming basis rather than on a system of registering land titles, there remain much greater risks of conflicting claims arising in regard to the same parcel of land.

It is necessary to have a survey of a mineral property before leasing of same. Sec. 64 (c). This, in fact, must be obtained in qualifying for a Certificate of Improvements.

Just as in the case of Sec. 80 (1) where the requirement is that a notice of intention to advertise the survey of a claim plus a copy of the plan of survey is to be "posted in a conspicuous spot on the claim" constitutes a relic of the times when prospectors resided near their mineral claims, so is the affixing of metal tags on posts as soon as reasonably possible "after the recording of the claim". Both provisions ought to be discarded or at least amended in order to be up to date.

Map sheets issued by the Department of Indian Affairs and Northern Development to prospectors and claim owners carry a warning notice to the effect that the map staking sheet is issued as a preliminary guide for which the department "will accept no responsibility for any errors, inaccuracies or omissions whatsoever on said sheet before adequate surveys have been made".

Prior to 1930 and the transfer that year to the provinces of natural resources, western provinces and the two northern territories had much the same system of mineral rights acquisition procedures. Since that time, however, there has been a tendency for each jurisdiction to follow a differing course in this respect.

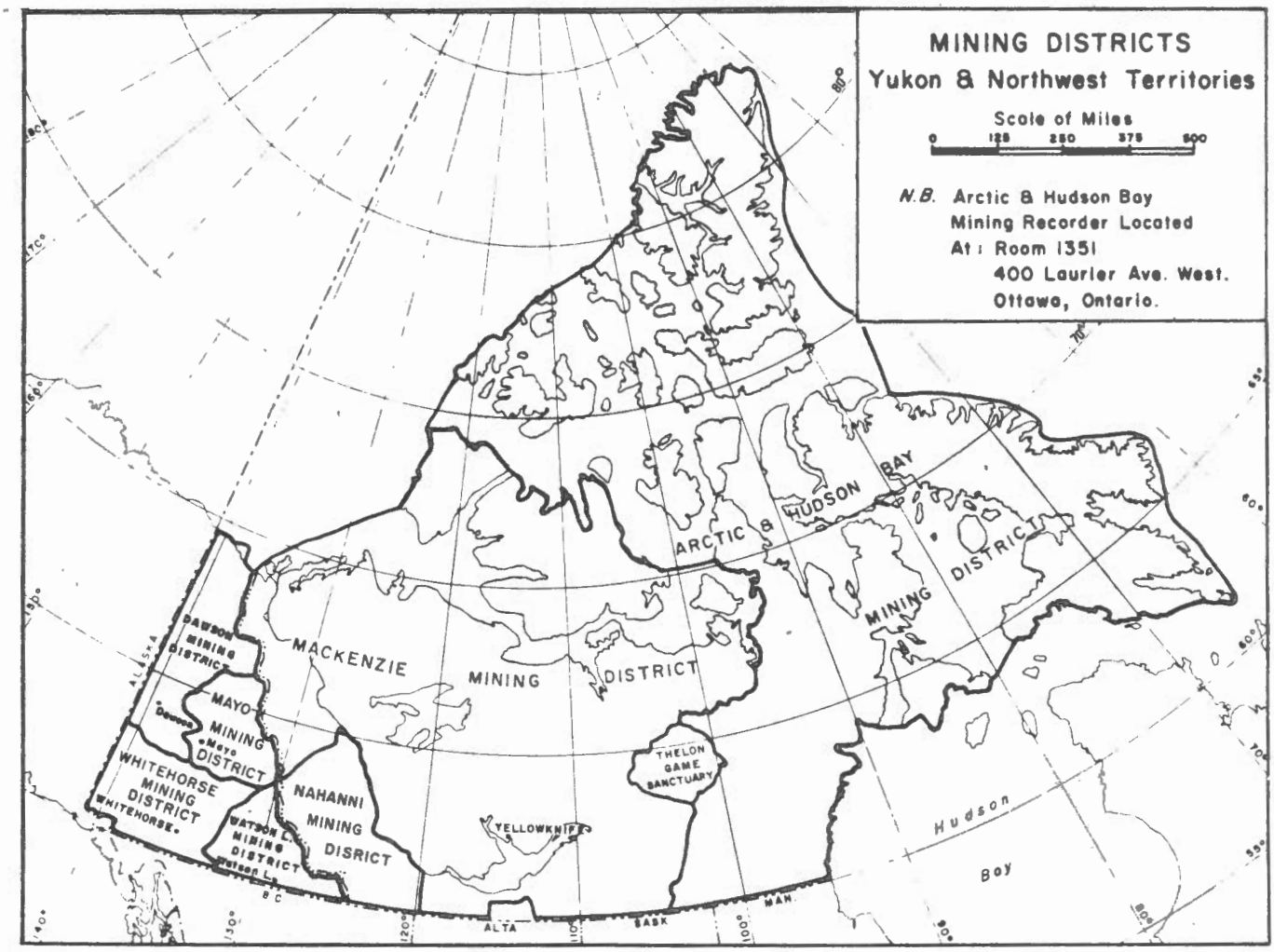


Mineral Claims as Shown on Portion of Map-Sheet, Mayo Area, Y.T.

NORTHWEST TERRITORIES

Staking and Claim-Marking System	:	4-post. A single post may be used for common corners. In treeless territory law satisfied if inscription is in waterproof container under mound or atop tripod. Sides of a claim may not exceed 1,500 feet and as near as possible astronomically north-south and east-west. A licensed prospecter, authorized so to do by company officers, may locate claims on behalf of that company. Regs. Sec. 9 (1).*
Maximum of claims per year per person	:	36 (on licence to prospect): on permit (in remote areas) 450 claims over 3 years (90 claims during the first year).
Maximum no. of claims for grouping	:	18 contiguous.
Dimensions of a full-size claim	:	1,500-foot-sides; containing 51.65 acres.
Perimeter surveying	:	authorized for group of adjoining (unlimited) claims.
Fixing of metal tags	:	"at time of staking". Sec. 20 (1) of Regs.*
Survey before leasing	:	survey necessary in such case and by a Dominion Land Surveyor. Regs. Sec. 44 (2) b.*
Term of lease	:	21 years, renewable. Regs. Sec. 46.*

* Canada Mining Regulations under the Territorial Lands Act and Public Lands Grants Act.


MINING DISTRICTS
Yukon & Northwest Territories
Scale of Miles
0 125 250 375 500
N.B. Arctic & Hudson Bay
Mining Recorder Located
At: Room 1351
400 Laurier Ave. West.
Ottawa, Ontario.
ARCTIC & HUDSON BAY MINING DISTRICT
MACKENZIE MINING DISTRICT
DAWSON MINING DISTRICT
MAYO MINING DISTRICT
Mayo
WHITEHORSE MINING DISTRICT
Whitehorse
WATSON L. MINING DISTRICT
Watson L.
NAHANNI MINING DISRICT
YELLOWKNIFE
THELON GAME SANCTUARY
Hudson Bay
ALASKA
B.C.
ALTA
SASK
MAN
ONT
YUK

HISTORICAL SKETCH

It was not until the mid-1960's that hardrock mineral production experienced a significant upsurge in the Northwest Territories although gold had been produced in important quantities in the vicinity of Yellowknife for a number of years previously. But the opening of the Pine Point mine on the south shore of Great Slave Lake marked the beginning of a new era in this part of Canada. This is a mine served by highway and railway. One indicator of progress in this field is the increase in total of mineral claims filed, from about 22,000 in 1966 in the Northwest Territories, to more than double that number in 1968. Also in 1967 the lead-zinc production alone of Pine Point Mines Ltd. reached nearly $100,000,000.00.

With the dawn of the 1970's Canada, north of the 60th parallel, including the Arctic Islands, is poised for major developments in oil and natural gas exploration, with the pace of this activity already accelerating each year. At the beginning of 1969 oil and gas permits in the Northwest Territories covered about 96 million acres; in the Yukon, 26 million acres; in the Arctic Islands, 188 million acres; and along the Arctic Coast (offshore) about 10 million acres.

Canada Mining Regulations apply to all lands forming part of Canada but not within any provinces or in the Yukon Territory.

In both the Yukon and the Northwest Territories each Mining Recorder maintains a registration system comprised of an individual file for each claim; a claim ledger system, each page of which provides the history of a claim; as well as special books of record. A claim map system is maintained covering the Mining District. These maps are prepared on a scale of one-half mile to the inch and use the N.T.S. system of map identification. Between 60 and 68 degrees latitude each map encompasses an area roughly 16 miles in each direction or a total of 250 square miles. The Yellowknife office produces in excess of 20,000 of such map prints each year.

Supervising Mining Recorders are posted at Ottawa and at Whitehorse and ensure that uniformity is observed in the mechanics of administering mining

acts and regulations. They also distribute information on prospecting and mining topics. These duties have increased greatly in recent years with new discoveries of iron, copper, lead-zinc, and asbestos in the Yukon and iron, lead-zinc, and copper in the Northwest Territories.

In 1929 there was a changeover in the Northwest Territories from the 2-post to the 4-post system of staking mineral claims.

In the 4-post system the staker posts the four corners of his claim and by clearing marks the lines between the posts when in wooded areas. In rugged terrain the task of staking under this system is more difficult than under the 2-post system but there is some compensation made over the entire operation in as much as surveys are less difficult and less costly than under the 2-post system, partly because of the more logical staking pattern as well as fewer instances of open ground, overlaps, or fractions of claims.

The device of the 3-year prospecting permit, as distinct from the prospecting licence, encourages corporations to explore in remote regions but does not shut out individuals from this type of activity. It is a system that enables permit holders to prospect a large area without competition for a limited period of time. If the holder of such a permit has performed required exploratory work then he may stake a total of 90 mineral claims during the first year of his 3-year permit; a total in the second year consisting of the difference between 270 claims and the number of claims staked during the first year and, in the third year the difference between 450 claims and the aggregate number of claims staked by the permit holder during the first two years. Sec. 27 (6) of Regs.

The recorded holder of a mineral claim is entitled to the minerals therein and has the exclusive right to prospect and to develop a mine on his claim in the course of a 10-year period, if during each year he performs the required assessment work.

According to some observers, during periods of mining "rushes" in the Northwest Territories certain stakers have "broken every rule in the book". Stakes, improperly inserted, fall down and are lost, metal tags are tied to

posts in bundles, or are left off posts or vanish completely. Some stakers forget to adjust their compass readings for magnetic declination so that location lines are occasionally as much as 30 degrees off true north.

There is a growing feeling that courts are displaying too much leniency in the matter of inadequate staking and that there should not be any premiums placed on laziness or neglect in this regard. In regions where the land is largely barren of trees and where very little loose rock is available for identifying a mineral claim on the ground there is, however, considerable difficulty in carrying out precisely the provisions of the regulations for claim-marking. Ingenuity in such conditions is required.

Where staking has been inadequately performed and when even posts found in position do not have tags or lack inscriptions, surveyors are faced with baffling problems in determining priorities in times of staking. Because of predicaments of this kind the trend towards some form of map selection or location of mineral properties continues to gain momentum. This careless type of staking is commonly known as "haywire staking". The question remains, namely, whether surveyors themselves are not partly to blame for the continuance of "haywire staking" when they refrain from rejecting a surveying assignment when posting is inadequate.

In some quarters it is felt that the basic size of the mineral claim unit should be considerably larger than 51.65 acres and, in fact, that there ought to be provision for two sizes of claims, namely, a smaller unit of acreage required for the development of claims of precious metals deposits; a larger unit for the recovery of base metals.

Dissatisfaction has also been expressed over the inadequacy in some instances of prospector's sketches submitted to the Mining Recorder at the time of filing on claims to which such sketches relate. In one example in which only a creek, with its name, is traced nearby the site of the claims and certain coordinates supplied, it was found on closer examination that the coordinates stated bore no relationship to the location of the named creek.

Mining inspectors in the field mention a lack of liaison between themselves and the offices of the Surveyor General in Ottawa. The inspectors wish to be kept better informed of the principles on which Dominion Land Surveyors arrive at their conclusions in making specific surveys of mineral properties. Actually such rules are contained in the Manual of Instructions issued by the Surveyor General, a publication available to all concerned.

A difference of viewpoint exists also as between mineral claim developers in the Territories on the one hand and Ottawa officialdom on the other, in regard to requirements for public posting and advertising of a plan and notice of survey of a claim. Canada Mining Regulations, Sec. 50 (1) b require that the advertisement commencing "Take notice that a survey has been performed" should appear in "eight consecutive issues of a local newspaper". As the principal local paper printed in the Northwest Territories is a weekly, the total notice period perforce exceeds 60 days. Developers are pressing for the use of the daily Edmonton Journal which is circulated at Yellowknife, for this purpose, thus reducing the waiting period to nine or ten days at most. Administrative officials point out, however, that the notice in these cases ought to be reasonably lengthy because once the survey of a claim is approved and adopted, boundaries of that property are fixed and the only remedy open to a disputant is a resort to courts of law. The Northwest Territories provision in this regard, it is claimed officially, is not far out of line with the analagous period provided in the Yukon Quartz Mining Act, Sec. 80 (1) which stipulates a publication period of "not less than 60 days in a newspaper published in or circulating in the district in which the claim is situate..."

Occasionally statutory provisions seem to directly contradict each other. In the Canada Mining Regulations Section 11 (1) expressly declares that a claim location "not exceed 51.65 acres", yet in Section 52 (1) and (2) of the same Regulations it is provided that "when upon a survey of a mineral claim or group of claims under these Regulations it is found that the area of the mineral claim or group claims exceeds the area indicated on the application to record, the said excess shall... be included in the

claim... and subsequent lease" (with the imposition of a penalty charge at the rate of five dollars per acre levied on the excess area). In other words a definite restriction is imposed in one place and then, subsequently, in the same Regulations, violation of that restriction appears to be condoned subject only to a special levy by way of penalty.

It should be pointed out that because of differences in details of regulations affecting acquisition of mineral rights as between the Yukon Territory and the Northwest Territories, surveyors have an unduly heavy responsibility to ascertain the precise location of the Yukon Territory-Northwest Territories boundary line in its relation to mineral claims under survey by them.

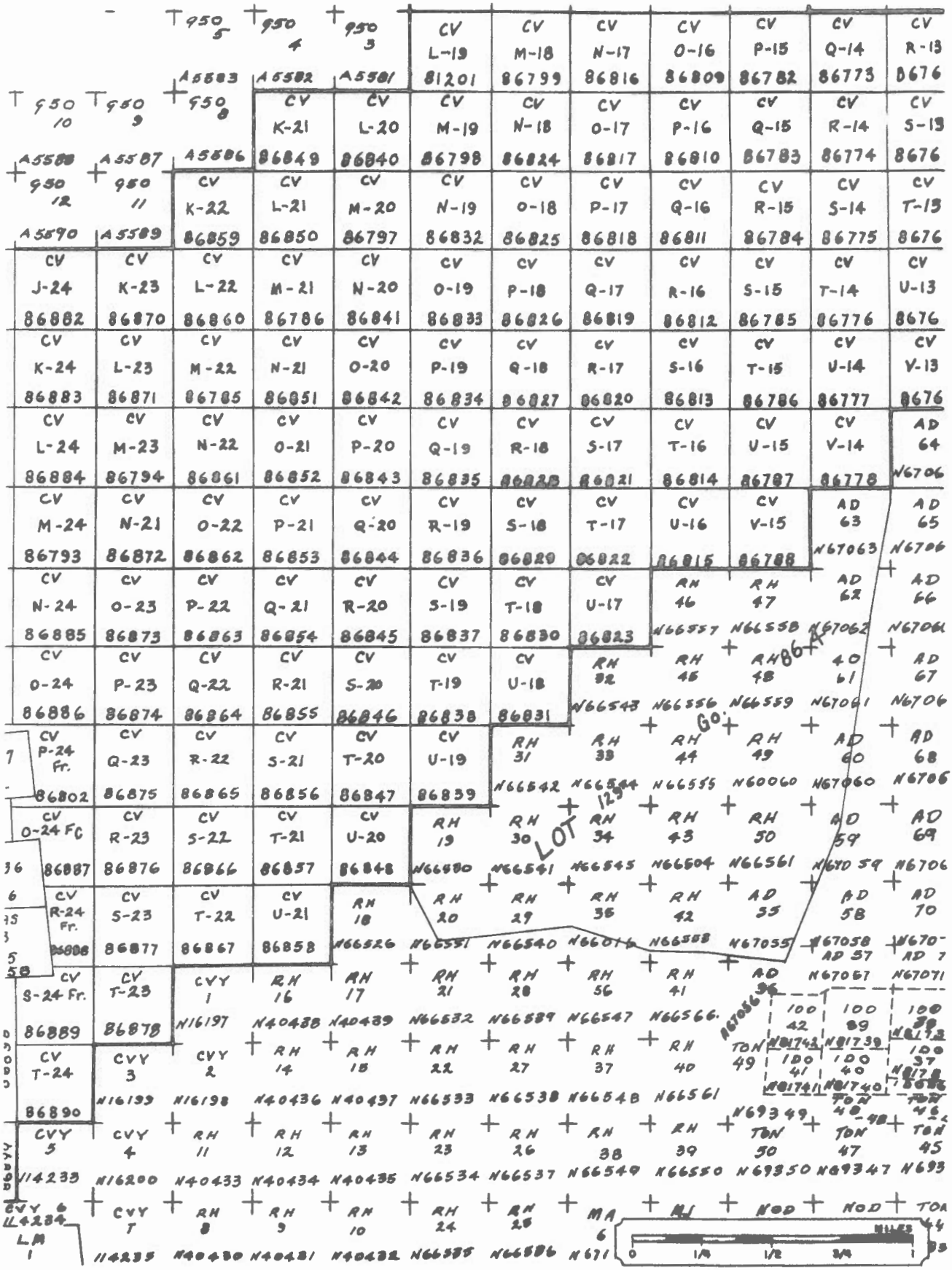
Under regulations formerly in force in the Northwest Territories prior to 1952, a licensee could produce not more than two submerged claims for a marginal claim (one located partly on shore, partly under water). The "call distance" was marked on the witness post concerning additional claims. Under the 1961 Regulations only one post is required, no marginal claims are needed and there is no restriction on the number of additional claims. A surveyor is faced with a formidable problem on how to arrive at the particular area of the lake or stream bed that he wishes to bound or delimit. Actually such a task is one for a large corporation, financially and geophysically well-equipped.

Some complaints were heard in the North concerning the long delays encountered in obtaining official approval of surveys of mineral claims from Ottawa.

There was some puzzlement over how a map selection system of mineral property location would operate under "rush" conditions, having in mind that about three-quarters of all such claims are staked in the Northwest Territories under "rush" conditions. Would long lines of individuals be content to stand patiently outside a Recorder's Office while the man at the head of the line identified his choice of property on a map?

What the Certificate of Improvements does is to summarize the steps taken by the holder of a mineral property as assessment work and to certify that the holder has qualified to receive or obtain a lease of that property.

Because of the relative remoteness of much of the Northwest Territories and the severity of its winter climate, the exploration and development of non-renewable resources in these regions are more costly and more time-consuming than similar activities in southern areas of Canada. The rules therefore are designed to provide incentives for such ventures. These incentives include a relatively large number of mineral claims and acreages available to the claims-seeker; a lack of rentals imposed during the claiming stage; the provision of generous exploration terms (of time) - 3 years for permits, 10 years for developing claims; relative security of tenure through 21 year leases renewable for similar periods together with a three-year royalty-free period for any new mine coming into production.



Mineral Claims as Shown on Portion of Map-Sheet, Pine Point area, N.W.T.

BRITISH COLUMBIA

Staking and Claim-Marking System	:	2-post. Mineral claims are located by placing two properly-inscribed posts not more than 1,500 feet apart. The line between these posts is the location line. Maximum width of claims is 1,500 feet, measured at right angles to the location line which must be blazed and cleared of brush. Staking by proxy is permitted if such agent also holds a free miner's licence. Sec. 11 (3) and 13 Mineral Act.*
Maximum of claims per year per licence	:	unlimited.
Maximum of claims for grouping	:	40 contiguous.
Dimensions of a full-size claim	:	sides of 1,500 feet (containing 51.65 acres).
Perimeter surveying	:	maximum number of claims, 40. Sec. 33 (2).*
Fixing of metal tags to stakes	:	at time of location of claim. Sec. 27 (1) 5.*
Survey before leasing	:	on proof to Gold Commissioner of completion of survey of claim by a B.C.L.S., a Certificate of Improvements and a lease may then issue. Sec. 59 (1) b.*
Term of lease	:	21 years renewable (Sec. 61 (2)).*

* Mineral Act, R.S.B.C., ch. 244, 1960.

HISTORICAL SKETCH

In the colony the Crown, in 1859, declared its ownership of all mines and minerals and, after confederating in 1871 with the four founding provinces and Manitoba, the new province retained control over mineral rights. Until 1891, under the Land Act, rights to base metals were included in Crown grants. Only precious metals were reserved to the Crown. Until 1893 surface rights, if available, were included in Crown grants under the Mineral Act. But subsequently mineral and surface rights were separated in most Crown-B.C. grants. Titles of Crown-grant lands and of mineral rights were registered under the Land Registry Act.

By amendment to the Mineral Act in 1957 the system of issuing mineral rights ownership in fee simple through Crown grants was replaced by a system of leasing said rights, although freehold titles acquired earlier than 1957 were not affected by this change. Ownership of leases of mineral rights from Crown-B.C. is recorded by the Department of Mines and Petroleum Resources.

A free miner's certificate must be obtained before a person can legally prospect for, locate and record any mineral claim. Such certificate enables entry for prospecting on Crown lands and on privately-owned lands wherein such right is reserved to the Crown. Under Sections 11 (3) and 13 of the B.C. Mineral Act (1948) and also, by inference, Sec. 27 v (c) staking by proxy is permitted but the agent must also hold a free miner's certificate.

The general view in B.C. mining circles is that the average prospector cannot be trained to read maps (assuming sufficiently improved maps become available for the purpose) and to interpret aerial photographs well enough to make a map selection system viable in regard to location of mineral claims as an alternative to staking on the ground in the first instance. This is their opinion, despite the successful sponsorship and operation each winter season for the past 50 years by the British Columbia and Yukon Chamber of Mines in Vancouver of a Prospector's Mining School at which instructions are given in a variety of subjects related to their calling.

A legal survey can be performed at any time during the life of a claim but it is not required by statute unless the claim holder wishes to obtain a

mineral lease of the property. Sec. 59 (1) b. Each claim can be surveyed as a separate entity, or a group of claims (up to a maximum of 40) may be perimeter-surveyed. With the advent of open-pit mining, a type becoming more and more numerous in B.C., it has become necessary to up-date the province's survey regulations (B.C. Reg. 99/70) to permit a third type of survey in an effort to preserve survey monuments from the depredations of earth moving equipment. This involves coordinating all claim corners and relating them to specially established, carefully selected control monuments placed outside of the bulldozers' field of operations. Special permission for such a survey must be obtained from the Surveyor General.

The leniency clause in the B.C. statutory law is Sec. 39 of the Mineral Act. It is stipulated in this section that failure of a staker to comply with the law or regulations shall not be deemed to invalidate location or recording of a claim if, on the facts, there appears to have been on his part a bona fide effort to observe the regulations and provided that his actions are not of a nature calculated to mislead other persons desiring to locate. On occasion this subjective test poses delicate legal difficulties.

Because, in the past, surface rights "in connection with the mining operation", if available, could be purchased for nominal amounts from the Crown by large mining companies, enabling them to embark on real estate business in a big way, this tendency was curbed by a new Section 118 in the Mines Act amendments of 1970 which requires that an applicant pay for available surface rights at raw land values and at the going or prevailing market rate per acre, a price determined by the Minister of Lands, Forests and Water Resources.

The Gauer problem in Manitoba (e.g. the need for a dual-function survey of mineral properties) is not really applicable in B.C. because in this province mineral rights surveys can be used for land title registration purposes. This practice is not yet embodied in statutory form but is permitted in fact.

Although the 2-post system of staking tends to produce overlapping of claims, open ground, fractions and gores, nevertheless it is a system better

suited to the rugged terrain of B.C. with its precipitous slopes and spells of inclement weather in regions where, as one observer declared, "a fellow would need to have the agility of a mountain goat" to prospect for and to stake properly in accordance with any other system.

Some B.C. land surveyors have expressed the view that if a grid similar to that used in Alberta and British Columbia in preliminary stages of exploration for oil and natural gas could be applied to hardrock mining, it could provide a suitable solution to existing problems in the acquisition of mineral rights in this part of Canada. The danger involved is that large companies would benefit under such a system to the detriment of individual prospectors. The situation would be improved even more, in the opinion of some veteran land surveyors in the province, if surveys of claims could be made at the very outset of the claiming process, eliminating the need for staking on the ground. This procedure, it is asserted, would be time-saving and the cost of such a service at this stage would be a wise investment, especially if the developer needs to go to the public early on, to raise funds. Even so, many companies may consider this procedure too expensive at the exploratory stage.

Section 80 of the Mineral Act provides machinery for the investigation of complaints asserting that a claim has been "located or recorded otherwise than in accordance with the Act". In four out of the last five cases of such complaints (as of June, 1970) claims have been cancelled by ministerial action. These results, it is felt by administrators, are bound to persuade prospectors to be much more careful and accurate in their staking activities.

The "included fraction" is a special problem in B.C., a deformity occurring in claim-staking and caused by "bends" developing in a string of continuous stakings intended to be in one straight line.

The Minister (Mines) under the Mineral Act, Part Six (Secs. 79 to 85 incl.) decides upon disputes involving mineral properties, with recourse to the courts of the province on appeal.

Sec. 51 of the Mineral Act provides that a claim, on the performance of specified work conditions and the issue of a Certificate of Work, can

remain in good standing without re-recording said claim. But the Cerificate of Work keeps the claim valid for $\frac{\text{x dollars}}{100}$ years only.

Section 59 of the Act provides for the issue of a Certificate of Improvements leading, in turn, to the issuance of a lease.

In the Act and Regulations thereunder it is provided that where evidence of location of a claim has been lost or destroyed the Court is accorded the right to make any necessary inquiry into the matter of rightful ownership of such claim. But under survey regulations (B.C. Reg. 99/70 5.06) acceptance of an affidavit from the original staker supporting his assertion of ownership and boundaries, is permitted or, even from his companion, if any, at the time of staking. The Act seems to be deficient in this connection in as much as no specific procedure is laid down to cover the situation.

ALBERTA

Staking and Claim-Marking System	:	2-post (since 1931) but since 1967 this system is largely obsolete in Alberta. At present location of properties by map selection in Mining Recorder's office. Staking by proxy no longer applicable in this province.
Maximum of claims per year per applicant	:	unlimited.
Maximum no. of claims for grouping	:	not mentioned in Act or Regulations.*
Dimensions of a full-size claim	:	quarter section (160 acres). Regs. Sec. 5 (1); ** permit area on a quartz mineral exploration basis is 50,000 acres - the length of said area not to be greater than 3 times its average width. Regs. Sec. 29 (1) (2). **
Perimeter surveying	:	Minister may require this in certain cases. Act, Sec. 37 (1).*
Fixing of metal tags to stakes	:	not applicable in Alberta.
Survey before leasing	:	Minister may require survey of location at expense of lessee in certain cases. Act, Sec. 37 (2).*
Term of lease	:	21 years renewable. Regs. Sec. 45. **

* Mines and Minerals Act, Statutes of Alberta, ch. 49, 1962.
** Quartz Mining Regulations, A.R. 377/67, as amended by A.R. 397/68.

HISTORICAL SKETCH

Formed as a province of Confederation in 1905, Alberta did not gain effective administrative control over its natural resources until the transfer of 1930 from the federal government. Some mineral rights had been alienated by the federal government to the Hudson's Bay Company and to railway companies nevertheless, Alberta retains title to about 81 per cent of mineral lands within its boundaries. Since 1930 mineral rights in the province have been granted by lease only. Mineral rights derived from the Crown are recorded in the Department of Mines and Minerals which came into existence as such in 1949. Titles to freehold minerals are registered under the Land Titles Act. In 1962 the Mines and Minerals Act (ch. 49 Statutes of Alberta) was passed and in 1967 under authority of Alberta Reg. No. 377/67 (dated October 5, that year) quartz mining regulations under the act were filed. In recent years there has not been any staking of coal properties in the province.

Crown-Alberta grants of mineral properties are based upon the township system of surveys. The onus is on the grantee to determine his location within that framework. He can only do this, of course, if there is a sufficiently well monumented network of control stations to enable him or his surveyor to find a point of commencement. The basic control for the existing township system of surveys is somewhat inadequate. Most township (D.L.S. system) base lines have been run in the province except for the extreme north-eastern part of Alberta, where such work is still incomplete. No mineral exploration or development is yet permitted in Wood Buffalo National Park and that federally administered park occupies a large part of north-eastern Alberta.

The provincial survey organization is now engaged on a program of control surveys, based on geodetic data, in territory relatively unsurveyed.

In 1962 unlimited staking was adopted in Alberta and the province then departed from the conventional concept of a mineral claim as well as of traditional methods of locating such a claim. Also the Common Law concept of the right of a prospector to enter upon privately-owned property "to

explore, work and win...minerals contained therein" was abandoned. Now an act of entry is acquired through an edict of the province's Right of Entry Arbitration Board.

This revolutionary change was brought about, in the statutory sense, partly by means of an amendment to the Public Lands Act, ch. 259, Sec. 5 (1), (2), Statutes of Alberta, 1955, and by means of which the right of entry was reserved to Crown-Alberta.

Under the traditional system of claim location considerable difficulty was experienced in Alberta because of the nature of the timber growth in that province. Poplar, spruce and pine woods used in the hard-weathering function of claim-posting tend to be quite perishable materials. Even tamarak will rot in time under such conditions although it is durable enough in muskegy terrain. Digging of pits in frozen ground is impracticable. Much paper work is also dispensed with when relatively large areas are provided for exploring and claiming for mineral extraction purposes. All these were factors in bringing about the transition to a map selection system now being followed by the province. Under this system locating and filing of claims take place on the basis of sections and quarter-sections (the latter being the minimum size of mineral claim in Alberta). A legal subdivision unit is only employed in this regard when such an area is all the property that remains from a previous allotment of lands.

There is some advocacy in the province for the establishment of one square mile (a section) or even of an area of 1,000 acres as the minimum size for a mineral claim.

As in the case of other provinces there are few full-time prospectors, earning the main portion of their livelihood from their calling, in Alberta.

The Gauer (Manitoba) problem of the need of a dual-function survey is not a significant issue in Alberta.

A new system of geodetic-type precision surveying named "Airmark" has been tried out in Alberta in the autumn of 1969 and is now in use in parts of that province on mineral location work. This new method involves the use

of a closed circuit television apparatus (2 sets) and a helicopter hovering at 300 feet elevation. This permits surveys of large land areas with accuracy (error of less than one foot) speed, and low cost...as a minimum of manpower and work time is required, especially in inaccessible regions.

There is a general view of mining men and administrators in Alberta that staking on the ground in the first instance or stage of the recovery process is an inefficient, time-consuming and out-dated method of identifying a mineral property under modern day conditions.

There is also a growing body of opinion in that province that government-administered control surveying, as well as other types of surveying, ought to be carried out on a year-round basis, regardless of season, if not by government surveyors, by private industry. It is asserted that mining firms regard seasonal programs of surveying as wasteful and expensive. Industry just cannot afford to wait, it is pointed out, for favorable spells of weather in order to perform urgently required surveys. The question is being asked, could not governments confine their responsibilities in this area of activity to administration only and to permit private industry to arrange for the performance of this field work?

Should hardrock mineral development become much more active in Alberta than at present, it would be the tendency of administrators in that province to follow the practices and procedures now in effect with regard to the recovery of oil and natural gas deposits.

Some advantages seen by Albertans in the adoption of a map selection system include:

(1) Elimination of irregular patterns of holdings, and of an occurrence of open ground, fractions, gores, etc.

(2) Elimination of searches by surveyors and others for non-existent stakes thus increasing the speed of location work as well as reducing its costs.

The right to any Crown-owned quarriable minerals, other than coal and oil sands, may be leased at an annual mineral royalty of $50.00 or at the rate of $1.25 per acre, whichever is the larger amount. The term of such a lease is 21 years, renewable. The maximum area of a location in this connection is not to exceed one section (640 acres) in the aggregate. Regulations concerning work are similar to those in coal leases.

SASKATCHEWAN

Staking and Claim-Marking System	:	4-post. In unsurveyed territory...one post at each corner, commencing at the northeast (No. 1) and proceeding clockwise. Mineral Disposition Regulations, Sec. 6 (5).* In the case of group of claims a single post may be used as a common post for adjoining claims. Posts to be connected by blazed trees, brush cutting, or pickets. Bearing of claims to be within 30 degrees of astronomic north-south, east-west except along side of previously staked claim or claim block. Staking by proxy is not particularly favored but there is nothing in the regulations to forbid it.
Maximum of claims per prospector per year	:	no limit.
Maximum of claims for grouping	:	36 contiguous. Regs. Sec. 12 (1).*
Dimensions of a full-size claim	:	in surveyed territory, a claim shall be a legal subdivision (40 acres): in unsurveyed territory no side of a claim shall exceed 1,980 feet nor contain more than 40 acres. Regs. Sec. 4 (1 and 2).* Claim blocks (in surveyed areas) not less than 1½ sections nor more than 24 sections (in unsurveyed areas) minimum of 960 acres maximum of 15,360 acres. Length of claim block not to exceed 6 times width. In effect the same sizes. Regs. Sec. 25.*
Perimeter surveying	:	permitted in practice but not mentioned in act or regulations.
Fixing of metal tags to stakes	:	option provided: 1. fixing at time of staking or 2. not later than one year after recording claim or claim block.
Survey before leasing	:	not required by act or regulation.
Term of lease	:	21 years renewable. Regs. Sec. 53.*

* The Mineral Disposition Regulations, 1961, under the Mineral Resources Act, ch. 50, 1959.

Note: See also The Subsurface Mineral Regulations (Potash), 1960.

HISTORICAL SKETCH

Mineral rights in this province have been granted under a leasing system since the transfer of natural resources to Saskatchewan in 1930. Although mineral rights in substantial areas of Saskatchewan were alienated prior to 1930, the province retains title to mineral rights to the extent of about 85% of the area of the province. Titles to freehold mineral rights are registered under the Land Titles Act. Permits and leases of Crown-owned mineral rights are registered (recorded) by the Department of Mineral Resources. The statutory basis for administration, discovery, management, use and conservation of minerals of the province is the Mineral Resources Act; Subsurface Mineral (Potash) Regulations 1960; the Mineral Disposition Regulations, 1961, the Coal Mining Regulations, 1957; the Petroleum and Natural Gas Regulations, 1969; the Quarrying Regulations, 1957; and the Alkali Mining Regulations.

Licences or certificates are not required in order to stake claims. But permits are issued to enable prospecting on an exclusive basis of permit areas of not less than 36 square miles and not more than 300 square miles.

Permits have a basic life of 3 years with two extensions possible of one year each. Sec. 40 of 1969 Regs. For each permit year the permit holder is required to deposit $25,000.00 in cash or bonds as a guarantee of assessment work in that year. A permit holder, under Sec. 49 of the 1969 Regs., can break up his permit area into claims and claim blocks or leases under certain specified conditions.

An application to record a claim block (unsurveyed territory) must be accompanied by a fee and plan showing the position of block in terms of topographical features, etc. or related to some known fixed point. The holder in good standing, after two years following recording, may reduce his holdings to not less than 640 acres in each block. Regs. Sec. 33a (1).

Legal surveys of mineral properties are played down in Saskatchewan law and regulations, possibly as an inducement to industry to enter the province by making requirements less strict, possibly also due to the lack of

sufficient inducement offered by companies from time to time in arranging for land surveyors to go into remote areas. Even a survey before leasing remains optional although legal surveys are listed as acceptable as part of assessment work. During the past several years there has been little or no surveying of mineral properties in Saskatchewan although it is likely that when the production stage is reached a mining company would have essential land surveys performed.

Each individual leased parcel of land is to be rectangular in shape.

A disposition of mineral rights does not convey surface rights. The surface owner, when damage is done to his property by a prospector or miner, is to be compensated therefor.

In Saskatchewan there are four main methods of disposition of mineral properties:

1. Claims 2. Claim blocks 3. Permits (solely to explore) 4. Leases.

The device of "claim blocks" was adopted in this province because large mining companies considered it unjustifiable, if not quite useless, expenditure to cut or blaze claim boundary lines in the hinterland. Permits, in practice, are issued between December 1 and March 31 only, when relatively few prospectors are in the field. Accordingly there is less risk of claim boundary disputes arising. Administration philosophy in Saskatchewan concerning mineral development is that of not requiring surveys, not even prior to leasing, on the assumption that the mining companies themselves will sort out any boundary line disputes that may occur.

In Saskatchewan, as in some other jurisdictions, an individual or corporation may hold an area of interest for as long as 10 years before obtaining a lease of same and in that preliminary period apparently the holder is not too concerned about the precise location of his boundaries.

In Saskatchewan today about 90% of mineral lands disposition is to large companies.

There are very few full-time prospectors in Saskatchewan at present.

Efforts are being made by the Controller of Surveys (Saskatchewan) to have the federal aerodist net (basic survey control stations) extended northward in the province from the 57 degrees parallel of latitude.

Every lease area in unsurveyed territory shall be clearly marked out by two sets of parallel straight lines, one set intersecting the other as nearly as possible at right angles and marked out by blazing trees, cutting brush, etc. A special tag shall be placed on every picket on each corner of the area and at quarter-mile intervals. Regs. Sec. 52 (1969).

In effect Saskatchewan has a map selection system of locating mineral properties in use at present in the southern (surveyed) areas of the province.

MANITOBA

Staking and Claim-Marking System	:	4-post: in unsurveyed territory a post at each corner of a claim, commencing at northeast corner and proceeding clockwise (Regs. Sec.22); blazing trees, cutting underbrush along boundary lines or use of durable pickets or mounds of earth or rock. Single post required at common corners of claims inside a group. In surveyed territory claims are marked by one inscribed post only, namely, at the northeast corner of a section or quarter-section or legal subdivision. (Regs. Secs. 20 and 22 (3)).* Staking by proxy permitted if staker holds miner's licence, but little of this type of staking being done now.
Maximum of claims per year per licence	:	a licensee may stake a claim block comprising an area not exceeding that contained in 18 contiguous claims, said block to be approximately square or rectangular, not more than 9,000 feet in length. (Regs. (1968) 27A (1)).*
Maximum of claims for grouping	:	36 contiguous claims. (Regs. Sec. 51 (1)).*
Dimensions of a full-size claim	:	in unsurveyed territory a square, being north-south, east-west astronomically as near as possible, containing 51.65 acres with 1,500 foot sides. In surveyed territory a legal subdivision (¼ of a quarter-section or about 40 acres).
Perimeter surveying	:	permitted at discretion of provincial Director of Surveys where a group of not more than 18 contiguous claims are held by one licensee, and is approximately rectangular and does not exceed 9,000 feet in length (Regs. Sec. 59 1(a)). Details of such surveys in Man. Reg. No. 59/60 see Sec. 31 1 (a).*
Fixing of metal tags to stakes	:	to be fixed at time of staking (pre-tagging) (Regs. Sec. 43(a) (4))* or not later than the first anniversary of recording the claim (Sec.41).*
Survey before leasing	:	in unsurveyed territory before holder of claim applies for a Certificate of Improvements or if the provincial Mining Board so orders, holder at his own expense shall have said claim surveyed

(continued)

Survey before leasing	:	by a Manitoba Land Surveyor. (Regs. Sec. 59 (1)).* In surveyed territory on application for lease of claim the Director of Surveys may direct that a survey be made at the applicant's expense. (Sec. 59 (2)).*
Term of lease	:	21 years, renewable. (Regs. Sec. 95 (1)).*

* Regulations, 1966, under the Mines Act, ch. 166, 1954 as amended by ch. 39, 1967.

HISTORICAL SKETCH

Under the terms of the Manitoba Act, 1870, administration of mineral and other natural resources of the newly-formed province was placed under federal jurisdiction. Up to January 11, 1890, mines and minerals were not excepted from freehold titles granted in Manitoba. But after that year mines and minerals were retained or reserved by the Crown under Order in Council P.C. 2167 dated September 17, 1889. In 1930 full control of such resources was transferred to the provincial government. The first Manitoba Mines bill became a provincial statute in 1897. In 1930, at the time of the resources transfer, the province passed a Mines Act which, with subsequent amendments, remains in force and effect.

Prior to the 1930 transfer of resources freehold title to mineral rights was granted on substantial areas in the province. Since 1930 mineral rights on Crown lands have been granted on a leasing system. Most titles to freehold mineral rights are registered under the Real Property Act. Dispositions of Crown-owned mineral rights are recorded by the Department of Mines and Natural Resources of the province. Rights to surface lands are not included with mineral rights disposed of by Crown-Manitoba. The Department of Mines and Natural Resources was created in 1928 and the Mines Branch by the Mines Act of 1930. Under the latter measure a Mining Board of three members was provided. . . .

In Manitoba, as in Ontario, the surveyor of the perimeter of a group of mineral claims is not required to provide an affidavit of 'no confliction' in relation to interior claims. His word that there is no adverse claim within that perimeter is accepted in Manitoba as part of internal office procedure. Other safeguards exist, it is claimed, such as spot checks from time to time by provincial inspectors of staking done. The returns of land surveyors provide a means of verifying inscribed data and checking the propriety of staking, which supplements the work of inspectors. The Mining Board of the province hears disputes involving ownership of mineral rights, including assertions by complainants of inadequate or wrongful staking of claims or insufficiency of assessment work thereon.

In Manitoba the full benefit of expenditures by individuals and corporations in surveys of mineral claims is not realized because of the limited value of such surveys in terms of the cadastral system under Land Titles Office procedures. The present mining claim surveys only serve that purpose and cannot be used as part of any system of control. Cadastral surveys for title purposes are made over top of the mining claim survey, thereby duplicating expenditures which would be unnecessary under another type of system. In the province it is now considered by large mining companies a matter of importance to reduce costs involved in the acquisition and development of mineral rights and properties. It is understood that the International Nickel Company of Canada has itself spent in northern Manitoba approximately one and a half million dollars on surveys alone.

In Manitoba those administrators and others particularly concerned with claims location procedures feel that if, with federal action, first-order ground control could be extended sufficiently in that province, the provincial Surveys Branch could assist in the establishment of second- and third-order ground control to make possible a workable map selection system. At this time, however, the provincial survey organization has not the funds available to perform this service in northern Manitoba. Some form of grid, it is conceded, could be made to serve satisfactorily, based upon a coordinate system and capable of being subdivided into fairly compact acreages.

One task involved in the application of a map selection system in Manitoba would be that of reconciling the township survey pattern, that is in effect in the settled (southern) portion of the province, with existing pattern (or lack of it) in regard to mineral properties in the northern part of Manitoba. The "Shield" country and the type of development taking place in that region are not adaptable to the township system that serves so well in an agricultural or prairie environment. It will be for Manitobans to decide, in this context, the precise location of the latitudinal line across the province beyond which the township system would not be extended northward. Base lines already surveyed in the more northern areas could be incorporated in the control traverse structure, thereby providing connections essential to inter-relate the two systems.

It is generally conceded by mines and surveys officials in Manitoba that the mineral claim unit ought to be made larger than the existing 51.65 acres, especially if any form of map selection system is to be introduced. Areas resembling sections or quarter-sections are considered in this province to be desirable sizes for the purpose. The present Director of Surveys is not so concerned with regularity of shapes of mineral properties as was his predecessor in office, basing the exercise of his discretion on Sec. 22, Surveys Branch Regulations, namely, "notwithstanding anything contained in these Regulations, the Director of Surveys shall have the authority to issue instructions and to accept plans of survey not strictly in compliance with these Regulations in special cases where compliance would be impracticable".

Regulations under the Mines Act, 1966: Sec. 155: "An application for a lease (for quarrying) in unsurveyed territory or where the area applied for comprises parts of legal subdivisions" shall be accompanied by a plan of survey made by a Manitoba Land Surveyor.

ONTARIO

Staking and Claim-Marking System	:	4-post: at each corner of a claim commencing at northeast corner and proceeding clockwise. Since 1960 re a group of pre-tagged claims staked under a single licence, common posts may be used at common corners e.g. only 28 posts required instead of 72 as formerly in a block of 18 claims. Posts of a claim to be connected in forested areas by blazed line; in non-forested areas by mounds of earth or rock or by durable pickets. Staking by proxy is not permitted.
Maximum of claims per year per licence	:	unlimited (formerly 90 claims).
Maximum of claims for grouping	:	the only limitation is not more than 4,000 days of work on one claim re application on contiguous claims held by the same licensee.
Dimensions of a full-size claim	:	in unsurveyed areas, 40 acres with 1,320 foot sides. In subdivided townships, 37½ to 50 acres depending upon the method of subdividing utilized.
Perimeter surveying	:	permitted on authorization by the Minister re two or more contiguous claims under the same name and after inspection of claims.
Fixing of metal tags to stakes	:	option provided: (a) to obtain tags before staking and fixing same at the time of staking or (b) to obtain tags after recording with fixing to occur not later than 6 months thereafter.
Survey before leasing	:	in unsurveyed areas and with the written consent of the Recorder. Required before issue of the Certificate of Record.
Term of lease	:	21 years, renewable (Mining Act, Sec. 100a (4) and (8)).*

* The Mining Act, R.S.O., ch. 241, 1960.
Note: Also Regulation 59/70 under the Act (Oil & Natural Gas North of the 51st parallel of latitude): also Ont. Reg. 301/69 under the Surveys Act (Ontario Coordinate System); also Code of Standards and Procedure for Surveys and Plans, Ont. Reg. 77/63 under the Land Titles Act, R.S.O., ch. 204, 1960; also the Procedural Guide, 1965, under that Act.

HISTORICAL SKETCH

As one of the four provinces of Canada, Ontario has maintained full control over its mineral resources from pre-Confederation times. Its mineral laws and regulations have undergone, since Confederation, many revisions as successive governments sought to solve problems of mining enterprise and administration, as well as to keep abreast of changing times and conditions.

From 1891 to 1908, in all land grants issued in the province, minerals in such lands were reserved to Crown-Ontario, whether expressly or by implication in the patent itself. By 1905 corner posts, as well as blazed lines, were required by law to mark the claim. Leases were substituted for grants in fee simple (a popular move), the government's motive being that, upon exhaustion of a mine, the land would revert to the province for forestry purposes.

In 1903 two lumbermen, skirting the shores of a small lake near Cobalt, Ontario, picked up a few pieces of shining metal. Not being prospectors they failed to recognize what they had found until an assay was made some time later and the substance proved to be native silver, a bright talisman of what was to become one of the world's largest and most valuable silver producing deposits. The effect of the Cobalt find upon the north country was electric. Mining laws became a subject of heated controversies. A newly-elected provincial government faced strong demands for changes in the mining law of Ontario. The government decided to consult the mining community of the province to ascertain just what changes were most widely desired. A meeting of all concerned was held in Toronto in December, 1905. Most of the 29 recommendations (the first six of which are listed below) passed at that meeting were subsequently implemented in legislation by the provincial government. The recommendations included proposals for:

1. A uniform mining law for the whole province.
2. All Crown lands to be opened for exploration and sale for mining purposes.
3. Mineral areas to be formed into recording districts.
4. Removal of royalties from the products of mines.
5. No actual discovery of minerals to be required prior to staking a claim.
6. Claims to be 40 acres in size in unsurveyed areas; an aliquot part of a lot in surveyed areas...each 37½, 40 or 50 acres, depending upon the local pattern of subdivision.

By 1907 Ontario, with an annual output of minerals valued at $25,000,000.00 had become the leading mineral-producing province of Canada. Ontario has continued to occupy this premier position among the provinces and territories ever since. In 1970 the corresponding total will be substantially in excess of one billion dollars.

In 1908 the second of the recommendations submitted by the Toronto meeting of three years earlier was carried into effect by the Legislature by an Act to amend the Public Lands Act which rescinded and made void all such reservations of minerals expressed or implied and the mines, ores and minerals were declared to have "passed with the lands to the subsequent and present owners thereof." The only exception being where the mineral rights have been disposed of separately from the surface rights. These provisions were later extended by legislation to the 6th of May, 1913.

On public lands the holder of a miner's licence could stake out a mining claim and, on complying with assessment work provisions and other requirements of the Act become entitled to a patent from Crown-Ontario conveying property in fee simple. This, of course, constituted a more stable title than one obtained on mere sufferance. In 1905 leases were substituted for grants in fee simple as has been indicated above. Thus, by 1906, three methods of acquiring mining rights in Ontario from the Crown had developed:

1. By purchase of a location, with the option of a leasehold rather than a patent in fee simple.
2. By staking a claim on discovery in a mining division and, on performance of required assessment work, become entitled to a patent or lease.
3. In surveyed territory staking an aliquot part of a lot on discovery, patent could be obtained on payment of the location price per acre.
4. In 1891 a provincial Bureau of Mines had been formed "to promote the mining interests of the Province". This Bureau was part of the Crown Lands Department, subsequently known as the Department of Lands, Forests and Mines. In 1919 Mines and Mining Lands were severed from the Department of Lands, Forests and Mines and placed under the newly-created Department of Mines.

The administration in Ontario of mineral rights under a Crown grant system was modified in 1963. A grant in fee simple was altered to a 21-year renewable lease which may be converted into a patent in fee simple upon the Minister being satisfied that mineral in substantial quantities is being produced continuously for more than one year.

Other important statutory steps taken in 1963 in regard to procedures governing acquisition of mineral rights in the province included in adoption of a system of surveying the perimeter only of a group of claims. In that same year, under Land Titles, a new Code of Standards and Procedure for Surveys and Plans (Ont. Reg. 77/63) was authorized. In 1965 officers of the departments of Mines and of the Attorney General produced a Procedural Guide to assist Ontario land surveyors in registering plans. Several additional statutory steps of significance in this realm were taken in Ontario in the closing years of the 1960's, beginning in 1967 when the province changed from a system of multiple-post staking to a system of common-post staking, followed in 1968 by provision for 2-post staking on a perimeter. In 1969 the transition to relatively unlimited staking took place.

Incidentally, Ontario authorities do not insist upon a non-confliction certificate or affidavit in connection with perimeter surveys. Built-in safeguards are provided against the occurrence of adverse claims. Open ground, under these circumstances, is not permitted. Title to a claim is dependent upon the time of staking, not on the time of recording. But priority in recording prevails.

The Mining Act of Ontario makes provision for the issuance to applicants of (1) a Certificate of Performance of Work (Sec. 83) and for (2) a Certificate of Record (Secs. 65-67), the latter document being conclusive evidence of performance of all work required under the Act. The Certificate of Record, if the Recorder is satisfied as to requirements of the Act being fulfilled, has the effect of quieting or stabilizing title to the mineral property and the holder of such a document may acquire a lease of the claim if the required assessment work is performed during the five years following recording of the claim. Such work may include an allowance for a survey of the claim by an Ontario land surveyor.

In unsurveyed territory of the province, before a patent, lease or licence of occupation of a claim is issued, the claim shall be surveyed by an Ontario land surveyor at the expense of the applicant but no survey of a mineral claim, except a perimeter survey approved by the Minister, shall be made without the written consent of the Recorder. Before a perimeter survey is made the claims to be included are inspected by an officer of the Department of Mines.

Applications to record claims must be filed with a Recorder not later than 31 days from the date of staking. Where a claim is of record for 60 or more days and no dispute has arisen the Recorder may issue a Certificate of Record to an applicant provided that a survey, if required, has been performed and approved and that surface rights compensation, if any, has been paid and the Mining Recorder is satisfied that the requirements of the Act have been met.

If surface rights are available an applicant may elect to have same included in his leasehold and such surface rights may only be used for mining purposes. Leasehold and freehold patents on mineral rights are registered under a land titles system (generally in northern Ontario) or a registry office system (generally in southern Ontario).

Under the Mining Act, 1906, momentous changes were made, including decentralization of the administration of mining lands in the province. Mining divisions were created and a Mining Commissioner was appointed by the government to decide all cases of dispute involving unpatented mining lands. His judgments were made appealable to the Appeal Court of Ontario. This Commissionership was superceded in 1924 by the creation of a Mining Court which, in turn, was dissolved in 1956. Mining recorders, resident in the divisions, and mining inspectors were appointed also. In 1956 the office of Mining Commissioner was re-established. This official has authority to decide cases of dispute, to relieve from forfeiture, and to extend time for the performance of assessment work. His decisions are appealable to the courts. Royalties on mine production were no longer demanded. Lack of continuity or consistency in provincial government mining policy was a

feature of 19th century Ontario (Upper Canada). For example, royalties on mineral production were imposed in 1862, changed to a "tax or duty" in 1864, abolished in 1865, reimposed in 1868, again abandoned in 1897 on lands already patented but imposing same on lands subsequently to be granted, reducing the rate of royalties in 1894 on the latter, and finally abolishing royalties in 1900.

Up until an amendment to the Act in 1922 an actual discovery of mineral "in place" had to be made on the property before a mining claim could be validly staked. By the 1922 measure such a requirement was eliminated.

A Select Committee on Mining was established by the Ontario Legislature in May, 1964, "to inquire into and report upon methods of stimulating prospecting and mining exploration and development in Ontario..." (2) Among other results of their investigation members of the Committee found that there are even to this day large areas, most of them remote, in the province that could be rewarding to traditional prospecting methods but that, generally, prospectors (if they are to be successful) must have their training and knowledge up-dated, as in other callings.

The Committee also found that the character of the search for metallic minerals had been changing rapidly in recent times. New aids in the form of more modern techniques and instruments are being developed continually. Tomorrow's prospector, in the view of the Committee, must be better trained than his counterpart in the past. Classes for prospectors, designed to improve prospecting methods, ought to continue to function in suitable centres. Results thus far are encouraging.

The Committee felt that the grid system, based on National Topographic Series maps, had definite advantages such as the elimination of problems arising from careless or inadequate staking on the ground with the occurrence of fractions, open ground, overlapping, gores, etc. but that before all Ontario could come under such a system, first order ground control would need to be greatly extended in the province. The Committee recommended, however, that Ontario north of the 51st parallel of latitude be designated for office (map) selection of mining lands or oil and gas lands. This proposal was

adopted by Ontario authorities in January, 1970, in regard to exploratory licences and leases for oil and natural gas only, in the area suggested. (Ontario Regulation 159/70, under the Mining Act, and approved by the Minister, January 22, 1970.)

A recommendation of the Committee that the term of a mining lease be reduced from 21 to 10 years has not been followed nor has the proposal to increase the size of mineral claims been implemented. Actually a period of from 15 to 25 years is often required in order to bring a promising mineral property into production due to various factors, including prevailing economic conditions.

QUARRYING

In June, 1970, the Ontario Legislature passed the Niagara Escarpment Protection Act restricting operation of quarries in that part of the province in order to preserve scenic aspects of the escarpment. This Act prohibits quarrying on the fact of the escarpment itself and greatly curbs such mining operations in a protected zone covering parts of 39 townships. Experience gained under the practical application of this legislation will provide a guide or basis for an impending general law affecting operations of pits and quarries throughout the entire province.

Under Sec. 120 of the Mining Act of Ontario the holder of a required quarry permit must keep a detailed record of operations and make same available to government inspectors. The right of a licensee to stake out a mineral claim on the same lands is unaffected by the quarrying permit. Application for a quarrying permit is made to a Recorder if the removal of less than 1,000 tons of material is involved, otherwise the application is made to the Minister or Deputy Minister of the Department of Mines of the province.

ACQUISITION OF MINERAL RIGHTS: PROPOSED CHANGE IN PROCEDURE

Men in the mining industry of the province as well as surveyors (government and non-government) were not hostile, generally, to a change from the traditional ground-staking system to a system of locating claims by map selection, supported by aerial photographs. But in most cases it was emphasized that before such a system could be implemented, first-order ground control would need to be extended considerably in Ontario in order to make possible, in turn, the production of detailed mapping required. Administrators in the Mines Department were less confident of the practicality of any such new method. A.B. McLennan, O.L.S., until recently chairman of the Mining Committee of the Association of Ontario Land Surveyors, has stated: "Regarding the possibility of an alternative to staking mining claims on the ground in Ontario my own experience would indicate that there is a method whereby ready definition in the offices of Mining Recorders could be obtained... I suggest that a Forest Resources Inventory sheet, mapping on a scale of ¼-mile to the inch, with aerial photographs at this same scale, would fulfil requirements. The size of claims could be enlarged... the applicant could apply to the Mining Recorder for certain areas and mark same on the F.R.I. map sheet and on aerial photographs in the Recorder's office". (Letter dated May 12, 1970, A.B. McLennan to D.W. Thomson.)

It should be pointed out that under the Survey Act (Ontario) a Regulation, No. 301/69, has been filed as of July 28, 1969, providing for the establishment of The Ontario Co-ordinate System, which is a uniform system of expressing the position of a point in terms of linear dimensions rather than in terms of latitude and longitude. This System is a modified Universal Transverse Mercator projection with co-ordinates of a point adjusted to the North American datum, 1927. This System, its institution in the province dependent to an extent upon the results of a departmental cost-benefit study, could be on a fully available basis late in 1970.

QUEBEC

Staking and Claim-Marking System	:	4-post. No. 1 at northeast angle, then posting proceeds clockwise fashion. No. 1 post to be legibly inscribed with name of staker, time and date of staking, while posts 2, 3 and 4 are inscribed with date of staking. Metal plates bearing no. of the post, no. of the claim and no. of prospector's licence are also nailed to all posts. Staking by proxy not authorized. (Act, Sec. 20).*
Maximum of claims per person at one time	:	holder of a prospector's licence may stake under authority of that document a maximum of 200 acres (Act, Sec. 23) and no person shall hold more than six such licences at one time (Act, Sec. 24). In unsurveyed territory every licence entitles holder to mark a maximum of 5 claims. In surveyed or unsurveyed territory the total area claimed is not to be in excess of 1,200 acres.
Dimensions of a full-size claim	:	in unsurveyed territory 40 acres, with sides about 20 chains in length, running north-south, east-west. In surveyed territory sides of claims must follow lines of the original division of the land except when the Minister orders otherwise. (Act, Sec. 35)*. Maximum lot size, 225 acres.
Fixing of metal tags	:	(see first paragraph).
Survey before leasing	:	no mining "concessions" issued since January 1st, 1968. In unsurveyed territory, application for a mining lease must be accompanied by a plan prepared by a land surveyor in accordance with Division 21 of Act. The Minister may also require such a plan in surveyed territory (Act, Sec. 95).*
Term of lease	:	a mining lease is usually granted for a period of between 5 and 20 years, renewable three times for 10 years periods.

* Mining Act, ch. 34, Statutes of Quebec, 1965.

HISTORICAL SKETCH

The history of mining in Quebec may be divided into at least five periods:

1. French regime (1534-1763)
2. English regime (1764-1867)
3. Federal regime (1868-1918)
4. Inter-war period (1919-1940)
5. Post-war period (1940's to present)

In the first-mentioned period, under Intendent Talon, systematic attempts were made to bring then known mineral deposits of New France into production, especially lead, iron ore, coal and copper. Exploration for minerals was nearly always prominent in the thoughts and plans of the pioneers, voyageurs and early settlers.

In 1823 placer gold was discovered in Beauce County, Eastern Townships. Later on in the century asbestos was discovered in this region, a land-mark in the development of the mineral industry in Canada. The report of Sir William Logan in 1863 constitutes the first scientific inventory of the mineral resources of what is now known as Quebec.

The Civil War in the United States stimulated the demand for metals, especially copper. From 1859 to 1866 the Eastern Townships experienced a mining boom and prospecting was a popular activity in all parts of southern Quebec. The hard work of pioneers and the timely investigations and reports of Sir William Logan also contributed to increased mining activity in this part of Canada at the end of the second period mentioned. The census of 1871 revealed that the total value of the products of mines in Quebec had reached $330,209.00.

A watershed date in the story of the mineral development of Quebec is July 24, 1880. The first mining act in Quebec was passed on that date.

Between 1878 and 1892 the Lievre River basin produced 200,000 tons of apatite. The quarrying industry of the province produced in 1918 a total of $1,335,000.00 worth of mineral products. The dominant feature of the third period of this history was the development of the metal deposits of western Quebec.

Before 1880 mineral rights in the province had been granted under French seignorial tenure or under English tenure. In the case of the former, mineral rights remained the property of the Crown unless expressly granted. In the case of the latter mineral rights (except gold and silver) were part of any grant of land for farming or colonization unless expressly reserved to the Crown. Mineral rights ceded under English tenure before 1880 may now be revoked under a new Mining Act passed at Quebec in 1965 (ch. 34) in instances where no development work has been done during the 10 years preceding notice from the Minister of an intention to revoke.

Under the 1880 measure mineral rights were separated from surface rights and rights to all minerals were reserved to the Crown. Accordingly, as from that year, grantees of land for farming and colonization have not received mineral rights with such land grants. Also, under the 1880 Act and amendments a mining "concession" could be purchased on mineral lands in the province which, in turn, entitled holders to letters patent and absolute title.

Under the Mining Act of 1965, however, mining "concessions" can be revoked unless mining operations have occurred thereon within a stipulated period of time after purchase of the mineral property or if there is non-payment of taxes.

The rocks of the Precambrian Shield soon began to attract the mineral prospector. By 1946 some 40 mines in the province had produced metals valued at $680,000,000.00. In that same year 24,000 claims were recorded in the province. To facilitate mineral claims recording, offices now function at Rouyn, Amos, Chibougamau and Quebec City, supplemented by local agents at Bourlamaque, Campbell's Bay, Hull and Montreal.

In the 1950's the development of iron ore deposits in New Quebec proved to be a leading feature in the spectacular progress of the mining industry of the province. From a total production of mineral wealth valued at less than $10 million in 1910 to more than $110 million in 1945 and to $720 million in 1969, Quebec's story in this realm of industrial activity is one of persistent and resourceful enterprise.

Any person aged 18 or over is eligible to obtain a prospector's licence on payment of a fee and such licensee may prospect on public lands, or on private lands where minerals are reserved to the Crown-Province. But this right does not apply on lands where rights to develop are already held or on lands withdrawn from mineral operations by a competent authority.

Regarding staked lands and in the case of a whole lot, half-lot or quarter-lot partly covered by water or encumbered by a highway right-of-way the mineral claim shall include the stretch of water or the land encumbered by the servitude. (Sec. 35 (4)).

If a lot of irregular shape is bounded by a river or stretch of water the staker may extend underwater, by witness posts on the shore, the sides of the claim so as to give it the area and shape that the lot would have had if it had not bordered on a river or other body of water. (Sec. 35 (6)).

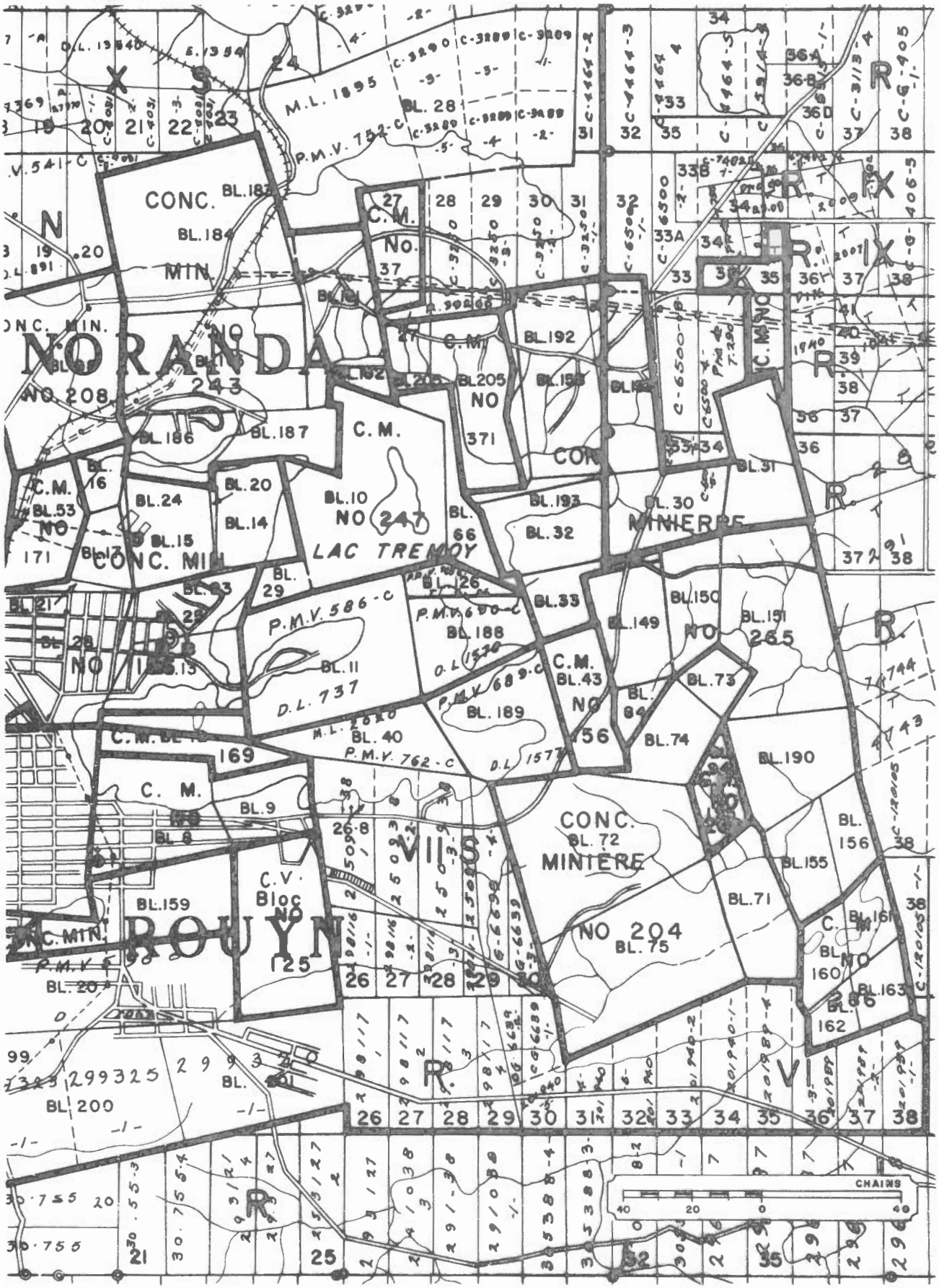
Life of a mineral claim in the province is 12 months from the time of staking; 24 months if the claim is situate north of the 52 parallel of latitude or in certain electoral districts named in the 1969 amendments to the statute... and to Sec. 46 in particular. A claim holder must perform 5 hours of manual labour per acre in the first year of his tenure in order to become eligible for a development licence. For this latter licence application must be made within 10 days of the expiry of the term of the claim. A development licence is valid for a period of 12 months and is renewable. After obtaining this licence a claim-holder who is able to establish reasonable evidence of the existence there of a mineral deposit "capable of being economically worked" is entitled to a mining lease.

A mining lease in Quebec is usually granted for a period of between 5 and 20 years, renewable three times for 10-year periods. Subsequent renewals may be granted by the cabinet council.

A mining judge, appointed by the government, has jurisdiction over the validity, forfeiture of any prospector's licence or claim, development licence, lease or concession. (Sec. 278, Div. 31).

Sec. 48 to 52 inclusive in ch. 34 (1965) provide a procedure similar to that provided in B.C. under Sec. 80 of its law governing the consequences of a complaint of inadequate staking of a mineral claim.

In unsurveyed territory of Quebec, the boundaries of land covered by a storage lease or disposal licence must be determined by a survey and indicated by boundary marks, run essentially north-south and east-west. Sec. 189m of ch. 36 (1968 amendments).



Mineral Claims as Shown on Map-Sheet of Rouyn-Noranda Area, Quebec

NEW BRUNSWICK

Staking and Claim-Marking System	:	4-post. No. 1 post at northeast corner, then staking proceeds clockwise. Act, Sec. 34 (3)*. Claim to be staked with boundaries magnetic north-south and east-west. A claim may be staked by a holder of a prospector's licence for himself for another holder of such licence. Sec. 34 (2)*.
Maximum of claims per person per year	:	unlimited staking. New Sec. 34 (1) of ch. 53, 1969.
Dimensions of a full-size claim	:	40 acres in form of a square, with sides of 20 chains (1,320 feet) Sec. 33 (1)*.
Perimeter surveys	:	required before issue of mining licence, Sec. 44 (2)* and before issue of mining lease, Sec. 51 (2). All such surveys to be made by a New Brunswick land surveyor.
Fixing of metal tags	:	to be affixed to corner posts at time of staking or not later than 3 months after recording the claim. Sec. 34 (5)*.
Term of lease	:	21 years, renewable. Secs. 54-55.

* Mining Act ch. 45, Statutes of New Brunswick, 1961-62. Amendments made in 1964, 1966, 1967, 1968, 1969, and 1970.

HISTORICAL SKETCH

Grants of land before 1784, when New Brunswick first came into existence, reserved generally to the Crown "all mines of gold and silver, precious stones, lapis lazuli, lead, copper and coals". Since 1805 all minerals, with minor exceptions, have been reserved to Crown-New Brunswick and are regarded as property separate from the soil. As one of the four founding provinces of Canada, New Brunswick maintained full control over its mineral resources at the time of Confederation (Sec. 109, British North America Act, 1867).

• • •

In New Brunswick Crown-owned mineral rights are disposed of in the following ways:

1. Prospecting licence	(Staking only confers the right to apply for a Certificate of Record). Section 38. Until licensee gets mining licence or lease, he is a tenant-at-will.
2. Mining Claim	(40 acres) is valid only for one year after recording same, and renewable. Sec. 39 (1).
3. Mining Licence	(annual and renewable).
4. Mining Lease	(21 year term and renewable).
5. Mining Reservations	obtainable when related to extraction of a certain mineral only. This arrangement includes exclusive rights to prospect in the reserved area.

When a mining claim has been recorded for 60 days the Recorder on application issues a Certificate of Record (conclusive evidence of performance of all requirements of Act except as to work conditions) and the claim shall not then be subject to invalidation. Sec. 37.

A Certificate of Work is issued if the Recorder is satisfied that assessment work requirements have been carried out as prescribed by the Act. Sec. 39 (7).

Once a mining licence or lease issues, the perimeter of claim groups must be surveyed by a New Brunswick Land Surveyor.

Possession of a Certificate of Record does not authorize holder to inflict damage to trees, soil, crops, etc. The holder of a mining right or a person who prospects may be ordered by the Minister to pay compensation for damage incurred by the proprietor of the surface (soil) caused by staking. Sec. 102 (1).

During the period between the issue of a certificate of record and the obtaining of a mining licence or lease, the holder of a recorded claim remains a tenant-at-will of the Crown in respect to that mineral claim. Sec. 38.

(Title of civil service status) performs the functions of the Adjudicator (term used in Act). Sec. 42 (3).

Crown lands may be granted under the Mining Act, to be used for mining purposes. The Mines Division of the same Department administers mineral rights. Mineral property surveys fall within the jurisdiction of this latter Branch.

The leniency clause in N.B. legislation is Sec. 36 (2) "where efforts to comply made in good faith the inclusion of more or less than the prescribed area...shall not invalidate the claim".

In cases where a mining licence is converted to a mining lease a second survey of the property is not usually required.

For assessment work purposes the maximum number of claims for grouping is 25...contiguous. Sec. 39 (9). Mining licences or leases may be amalgamated by consent of the Minister.

As yet no appeals from the present Mining Commissioner to the courts of the province from rulings. Sec. 70 provides for such appeals.

The Minister may award open ground, fractions, etc. to the holder of surrounding mineral properties, to either or both of adjoining claims. Sec. 20 (1).

The holder of mining right shall not use his land for any other purpose whatsoever and shall use lands in such manner as will be least injurious to the owners and occupants, or to contiguous lands. Sec. 75.

It shall be the duty of a surveyor, before beginning his survey of a mineral property, to examine the application for the mining right and the plan (sketch) that accompanied same...to ascertain by careful examination of the ground whether or not <u>any other</u> right conflicts with the mining right to be surveyed. The surveyor shall furnish with his return of survey a certificate to the effect that he could find no trace or indication of any conflicting claim right. Sec. 31.

NOVA SCOTIA

Staking and Claim-Marking System	:	location of claims made on grid system. Map sheets of National Topographic Series used as reference maps for determining claim boundaries. Each map sheet is divided in four, lettered A, B, C, D. Each such quarter is divided into 108 numbered tracts, each of about one square mile. Each mining tract is subdivided into 16 parcels of about 40 acres each.
Maximum of claims per person per year	:	application for a prospector's licence (valid for one year) may include not more than 16 contiguous claims. See Act, Sec. 29 (3)*.
Dimensions of a full-size claim	:	1/16 of tract of one square mile (40 acres).
Survey before leasing	:	on a claim "covered by any lease" a survey will be made to establish boundaries. Act, Sec. 119 (4): A survey of a claim under licence may be ordered by the Minister, Act, Sec. 1-6 (1): also in any provincial district where more than 6 contiguous tracts are under lease, the Minister on request of a lessee may order a survey and a marking on the ground. Sec. 118 (1)*.
Term of lease	:	20 years; with provision for three renewals of that term. Act, Sec. 39 (4), also Sec. 40*.

* Mines Act, Chapter 179 (1954).

Note: Under Revised Statutes of Nova Scotia 1967, ch. 179 is now ch. 185. Sections of the 1954 Act are renumbered in the 1967 consolidation.

HISTORICAL SKETCH

The first general mining act passed in the province was enacted in 1885. Previously mines had been operated under rules and decrees purporting to control mining activities in Nova Scotia but which were not general mining law. In 1940 the Nova Scotia Department of Mines adopted the map selection system for the acquisition of mineral rights including all prospecting as well as exploration for oil and natural gas. This system was then incorporated in the Mines Act, ch. 179 of the Statutes of Nova Scotia, 1954 providing for location of claims on a grid based on the National Topographic Series of maps. All minerals in Nova Scotia are reserved to the Crown-Province except limestone, gypsum, and building materials which are the property of surface rights holders unless otherwise decreed.

Provision is made in the 1954 Act for the appointment of an Advisory Board on Mineral Development to advise the Mines Department and "to perform any special services to assist the mining industry". Sec. 161 (1). No mineral rights are held in fee simple in Nova Scotia. A record of all prospecting licences and leases of mineral properties is maintained by the Department of Mines.

If a claim can be plotted on a plan in the office so as to show its location on the ground and also in relation to other ground in the same locality a survey on the ground may be dispensed with. If a survey be ordered the expense shall be borne by the applicant.

Prospecting licences are valid for one year, renewable for each of five years if statutory work is being done.

No limitation is expressly fixed on the number of applications that can be made by one applicant but discretion as to the total rests with the Minister.

There is no indication in the Nova Scotia Mines Act as to the nature or type of posting or monumentation required if there is a marking of boundaries of a mineral property on the ground. This lack may be due to the nature of the basic selection or location system.

Nova Scotia is now engaged, under the Atlantic Provinces Co-ordinate System (newly instituted) in establishing ground control points every half-mile, provided the factor of intervisibility of such points is present.

NEWFOUNDLAND

Staking and Claim-Marking System	:	4-post. No. 1 post at northeast corner then staking by properly inscribed posts, proceeds clockwise. Act, Sec. 14, also Sec. 15 (a) (b) and (c)*. Boundary lines to run north, south, east, and west magnetically. Lines to be blazed, underbrush cut or, where no trees, marked by pickets or mounds. Sec. 15 (d)*. Staking by proxy permitted. Sec. 15 c (ii)*.
Maximum of claims per person per year	:	unlimited staking to holders of miner's permits; maximum of 9 contiguous claims may be grouped for assessment purposes, Sec. 42 (1)*, or in special circumstances, a maximum of 18. Sec. 42 (2)*.
Dimensions of a full-size claim	:	a square of 40 acres, sides of 1,320 feet.
Perimeter surveys	:	not required until application made for development licence.
Fixing of metal tags	:	not required.
Survey before leasing	:	before a development licence issues (a step taken preliminary to leasing) a proper survey of each claim is to be made by a qualified surveyor. Sec. 58*.
Term of lease	:	maximum of 50 years. Sec. 68*.

* Crown Lands (Mines and Quarries) Act, 1961.

HISTORICAL SKETCH

The first mining law, 1860, empowered the Governor of the then Colony to issue leases for 99-year terms as well as grants in fee simple. Prior to 1930 Crown lands were administered under an 1872 law. Original discoveries were to be marked by a stake at the centre of a discovery location. Then a mineral claim surrounding the discovery stake was laid out in the form of a rectangle, one mile by 1/2-mile. The Mines Minister developed a plan or pattern of such claims in the vicinity of the discovery. These claims were all numbered and any interested party could apply to the Minister for a One-year claim licence. After that period an application could be made for a 99-year lease. Upon expenditure of $6,000.00 during the first five years of a lease, a grant in fee simple would issue to the leaseholder. A Crown Lands Act, 1930, authorized government grants of mineral rights, available under 99-year leases convertible to grants in fee simple. Mineral rights on about 4,300 square miles or 2.7 per cent of total lands of the province are now held in fee simple. Newfoundland entered Confederation in 1949. Control over natural resources belonging to Newfoundland at the time of union was vested in the province by Sec. 37 of the Terms of Union. In 1951 The Crown Lands (Mines and Quarries) Act was passed providing for disposition of mineral rights under a leasing system. This law does not affect mineral rights held in fee simple or otherwise under terms of previous legislation. Under this Act mineral rights are disposed of separately from surface rights. Mineral rights can now also be disposed of by individual agreements with the government of Newfoundland.

The government in council may, by notice to the public, reserve from operation of the 1961 Act all minerals, quarry materials, etc., situate in any area of the province and grant to a permit holder exclusive right to explore and prospect on that reservation and to obtain mineral rights therein. (Section 11 (b)).

In 1952 a Mines Branch was formed. In 1961 the Department of Mines, Agriculture and Resources came into being by statute. The Mines Branch thereof is concerned with the control and administration of all matters

relating to mines, minerals, quarries, geological and allied surveys, mining taxation, and administration of Crown lands. Titles and grants are registered by the Mines Branch.

An officer of the Crown or assistant who makes a discovery of any minerals, etc., shall stake out and record a mining claim for the Crown. Sec. 12.

A miner's permit does not indicate in the holder an exclusive right to search for minerals until he has acquired the right by compliance with all requirements of the Act relating thereto. After 60 days following recording of a claim the Minister may issue a Certificate of Record (Sec. 23). A Certificate of Work is available under Sec. 46 and a development licence under Sec. 57. The latter document is the final step before leasing.

A development licence should not issue until the applicant has had a proper survey made of each mining claim (Sec. 58). Details of the manner in which such survey is to be performed are contained in Sec. 59. The surveyor is required to furnish a certificate to the effect that he "has no knowledge of any conflicting claim except..."

There is considerable emphasis on leniency provisions in the Newfoundland Act. Sec. 16 (3) provides that "where the Minister is satisfied that a person who has contravened the rules on staking acted in good faith, etc., "then upon a fee payment a certificate issues entitling him to stake the said property properly.

Sec. 18 provides that where there is substantial and reasonable compliance with requirements of the Act this shall be deemed sufficient.

Sec. 20 states that where there is a failure to abide fully by Sec. 19 in as much as the area staked may be more or less than the properly prescribed area, this fact shall not, where there is evidence of good faith, invalidate said claim.

Sec. 61 states that where, on a survey, the area of a claim is found to exceed the proper acreage, the Minister may require the size to be reduced to the correct amount of land.

A permit holder may submit to the Department a dispute verified by affidavit, alleging that a mineral claim is illegal or invalid. Sec. 22.

A permit holder or any person who prospects shall pay compensation to the owner of land for damage caused to surface rights by staking operations. Sec. 54.

The cabinet may issue to a permit holder a lease of any quarry materials covered by the permit, but maximum of 12 acres is stipulated for a lease not exceeding a term of 25 years, subject to royalties, etc. Sec. 85 (1).

A quarry lease may not issue unless the permit holder, before expiry of the permit, has filed with the Department a proper survey of the area applied for. The survey is to be approved by the Minister. Sec. 85 (2).

A permit holder, merely by staking a mineral claim, does not therefore acquire title to any quarry materials. Sec. 26 (b).

In the absence of mistake or fraud, a Certificate of Record is final and conclusive evidence of the performance by the permit holder of all requirements of the Act relating to the mineral claim, and said claim shall not thereupon be subject to impeachment or forfeiture. A judge may revoke a certificate issued by mistake or fraud, on application of the Crown or by any interested person. Sec. 24, 25.

Rights to minerals and to quarry materials are acquired by complying with different sections of the Act.

Rights to quarry materials are acquired by applying to the Minister for a Quarry Permit, valid on issuance for a maximum period of one year. Section 83 (1).

The holder of a Quarry Permit may apply for a long term quarry lease for an area held under Permit provided that the area does not exceed 12 acres, provided that the application is filed before the expiration of the Permit, and provided that a proper survey of the area has been filed. The survey is to be approved by the Minister. Section 85.

PRINCE EDWARD ISLAND

HISTORICAL SKETCH

At the time this province joined Confederation (1873) control over its mineral resources and rights was retained by Prince Edward Island. Crown-owned minerals are disposed of through a leasing system. In 1920 an Act to Encourage the Discovery and Development of Oil and Gas was passed, the first legislation of the province to proclaim that all minerals in the Island are vested in the Crown. The same Act declared that rights to minerals are separate from surface rights. In 1947 the Department of Industry and Natural Resources was formed and is responsible for the disposition of mineral rights, levying of royalties and rentals and control over safety practices.

In 1957 the Oils and Minerals Act was repealed and replaced by the Oil, Natural Gas and Minerals Act (ch. 24). A licence or lease is required in Prince Edward Island in order to prospect or to mine minerals.

In 1968 the value of minerals produced in and by Prince Edward Island was $976,742.00 or 0.1 per cent of the total value of mineral production in all Canada in that same calendar year.

FOOTNOTES

1. 26th annual Conference Proceedings, p. 38.

2. Report of Select Committee on Mining (Ontario Legislature), May, 1966, p. 2.

3. Report of Select Committee on Mining (Ontario Legislature), May, 1966, p. 7.

SUMMARY

As between the various jurisdictions of Canada there is considerable variation in the number of claims made eligible for grouping for purposes of facilitating statutory or assessment work thereon. The practice of allowing work performed on a single claim to qualify adjoining claims in this regard by means of different grouping patterns has led, in some instances, to "swivel grouping", in effect an evasion of assessment work provisions.

In the matter of size of a mineral claim unit Manitoba, British Columbia and the two territories observe the requirement of 51.65 acres contained in a square with 1,500-foot sides. Other provinces, except Alberta, provide for a square 40-acre area with 1,320-foot sides. In Alberta the minimum size mineral claim is 160 acres. Claim blocks in Saskatchewan vary from 960 acres to 15,360 acres. (24 sections).

Some jurisdictions in Canada in regard to contiguous mineral claims have authorized the performance of perimeter surveys in order to expedite and render less costly the surveying of blocks of land (groups of holdings), when such blocks or groups are in the name of one holder. With the observance of certain regulatory safeguards it is thus possible to survey the circumference of a group of claims, rather than measure and monument each individual claim within the block or group. Perimeter surveying is authorized in the Northwest Territories but not, as yet, in the Yukon. The provinces of Ontario, British Columbia and Manitoba have in effect detailed regulations relating to perimeter surveying.

In regard to tagging, Ontario, Manitoba and the Northwest Territories require that metal tags be affixed to corner posts "at the time of staking". In Ontario and New Brunswick an option is provided in this regard. In the Yukon Territory the tags are to be affixed to posts "as soon as reasonably possible after recording of the claim" and in Saskatchewan such tagging is permissable within one year after recording the claim in question.

In the matter of the total number of mineral claims that can be recorded by any one applicant in any one year there is considerable variance evident

among the jurisdictions. In Ontario, British Columbia, New Brunswick, Saskatchewan, Alberta and Newfoundland no limit is legally provided on the total number of claims that can be filed upon in any one year by an applicant. This trend to unlimited staking has gathered momentum in Canada during the past ten years.

Other pronounced trends in evidence in this country's mineral rights acquisition and development system include the discarding of title grants of mineral properties in favor of leasing of such properties by the Crown; toward greater freedom in the grouping of claims and in surveying of perimeters of blocks or groups of claims; toward a revision of fee structures designed to achieve greater equity, particularly between large, affluent prospecting firms on the one hand and sparsely equipped and underfinanced individuals on the other.

In Ontario, Quebec, Manitoba, New Brunswick, Newfoundland and in the Northwest Territories the 4-post system of staking mineral claims has been in legal force and effect, with certain modifications. In British Columbia and the Yukon Territory the 2-post system of staking applies. In Nova Scotia and Alberta, in the location of mineral properties a map selection system is being practised rather than conventional staking on the ground.

Among those interviewed in connection with this study practically no complaints or grievances were voiced concerning the quality of surveying of mineral properties. There was some dissatisfaction expressed over what was regarded by clients as a very high cost of having the survey service performed.

There is a substantial body of opinion among surveyors, administrators and men in the mining industry of Canada favoring a larger size of claim unit, though views differ considerably concerning just what would be the most suitable number of acres for the purpose.

There is a noticeable trend in most parts of Canada among persons directly concerned with the issue, in support of a test of map selection in each of the main mining regions of the nation...a try-out of the system of locating mineral properties in the first stage of mineral rights acquisition

by the use of detailed maps supported by aerial photographs. It should be emphasized that in British Columbia and in the Yukon Territory in particular there is less interest shown in mining circles in any departure from the conventional method than elsewhere in the country.

Most persons interviewed agreed that if a map selection system is to be adopted in the near or distant future the following requirements must first be met:

1. Improved networks of ground control.
2. Production of more detailed mapping than is now available.
3. The establishment and encouragement of mining courses for prospectors, in all regions, in the arts of map reading and air photo interpretation.
4. Alterations in fee structure in each jurisdiction to attain greater equity.
5. The establishment, if possible, of a standard mineral claim unit of a larger size than at present provided in the various jurisdictions.

List of individuals interviewed by Don W. Thomson in the course of this Study:

Anderson, L.L., D.L.S.	Chief, Field Surveys Section, Legal Surveys Division, Ottawa.
Andrews, G.S., P.Eng., B.C.L.S.	Former Surveyor General of B.C.
Archibald, R.	Staff, Supervising Mining Recorder, Whitehorse, Yukon Territory.
Armstrong, Don, O.L.S.	Assistant Examiner of Surveys, Ontario Dept. of Mines, Toronto.
Baxter, B.R.	Supervising Mining Recorder, Y.T.
Beakhust, Graham	Staff, Northwest Survey Corp. Ltd.
Berman, Max, O.L.S.	Executive Assistant to the Surveyor General of Ontario, Toronto.
Blakey, K.B.	Deputy Minister, Dept. of Mines & Petroleum Resources, B.C.
Blackie, W.V.	Chief, Plans Examination Section, Legal Surveys Division, Ottawa.
Boivin, J.	Assistant to Secretary General, Quebec Metal Mining Association.
Bowles, E.J.	Deputy Gold Commissioner, Dept. of Mines and Petroleum Resources, B.C.
Boyd, H.	Manager, Yukon Chamber of Mines, Whitehorse, Yukon Territory.
Brown, M.	Mining Inspector, Yellowknife, N.W.T.
Byrne, Norman	President, N.W.T. Chamber of Mines.
Callan, J.	Technical Draftsman, Office of the Surveyor General, B.C.
Cawley, J.T.	Deputy Minister, Dept. of Natural Resources, Saskatchewan.
Clements, C.S.	Mines Commissioner, New Brunswick.
Code, R.G., O.L.S.	Surveyor General, Ontario (Toronto).

Dawson, D.K.F., A.L.S., D.L.S.	Mobil Oil of Canada Ltd., Edmonton.
Douglass, Don	Deputy Minister, Dept. of Mines, Ontario.
Ferguson, Dr. Stewart	Geologist, Ontario Dept. of Mines.
Flemming, Neil	Chief Surveyor, Economic Improvement Corporation, P.E.I.
Elliott, Tom	Manager, B.C. and Yukon Chamber of Mines, Vancouver.
Findlay, Arthur O.	Assistant Registrar, Mining Rights, Nova Scotia Dept. of Mines.
Finland, G.H.	Manager, Alberta and Northwest Chamber of Mines, Edmonton, Alberta.
Gairns, D.W.	Supervisor of Lands and Mining Recorder, N.W.T., Yellowknife.
Gamash, E.F.	Registrar, Land Titles Office, Edmonton, Alberta.
Gauer, Ed, M.L.S., D.L.S.	Former Director of Surveys, Manitoba.
Gilbert, Dr. J.E.	Assistant Deputy Minister, Dept. of Natural Resources, Quebec.
Girroir, E. Lavin	Registrar, Mining Rights, Dept. of Mines of Nova Scotia, Halifax.
Gobert, M.J.	Deputy Minister, Dept. of Mines, Manitoba, Winnipeg.
Goldsmith, P.	President, Terra Nova Exploration Ltd., Quebec.
Gooding, B.D.	Assistant Administrator, Mineral Lands, Saskatchewan, Regina.
Grenier, Dr. P.E.	Dept. of Natural Resources, Quebec.
Harris, Brig. L.J.	Consultant to the Director, Surveys and Mapping Branch, Ottawa.
Hoever, B.E., S.L.S.	Midwest Surveys Ltd., Regina, Calgary and Edmonton.
Hosford, A.D., A.L.S., D.L.S.	Northwest Survey Corporation Ltd., Edmonton, Whitehorse, Yellowknife, etc.

Impey, H.E., A.L.S., S.L.S., M.L.S., D.L.S.	White, Hosford and Impeg, Land, Air, and Control Surveys, Edmonton, etc.
Kerr, J., O.L.S.	Assistant Examiner of Surveys, Ontario Dept. of Mines, Toronto.
Langlois, L.G.	Secretary General, Quebec Metal Mining Association, Quebec.
Macdonald, Dr. R.D.	Labrador Mining and Exploration Co. Ltd., Montreal.
Lukins, F.J.	Chief Mining Engineer, Dept. of Mines, Agriculture and Resources, St. John's, Newfoundland.
McCuaig, Dr. J.A.	Great Lakes Nickel Corporation Ltd., Montreal.
McGinn, J.R.	Chief Mining Recorder, Ontario Dept. of Mines, Toronto (now Director of Mining Lands).
McIntosh, William, O.L.S.	Senior Examiner of Surveys, Ontario Dept. of Mines, Toronto.
McLaughlin, A.W., N.B.L.S.	Acting Director, Lands Branch, Dept. of Natural Resources, N.B., Fredericton.
McLennan, Alex, B., O.L.S.	Chairman, O.L.S. Association Mining Committee.
McManus, L.H., P. Eng.	Deputy Minister, Dept. of Highways and Transport, Alberta, Edmonton.
Mode, D.H.	Director, Mining Lands, Saskatchewan, Regina.
Morgan, Dr. Harry	Merrill Island Mining Corporation Ltd., Montreal.
Morgan, Trevor	Chief Mining Recorder, Manitoba, Winnipeg.
McColl, F.A.	Regional Director of Resources, N.W.T. and former Mining Recorder, Yellowknife.
Mortimer, S., D.L.S.	Plans Examination Section (Mineral Claim Oil and Gas and Territorial Surveys), Legal Surveys Division, Ottawa.

Needham, G.	Mining Inspector, Yukon Territory, Whitehorse.
Nimchuk, B.R.	Mining Recorder, Dept. of Mines and Minerals, Alberta, Edmonton.
Osborne, C.T.	Chief, Plans and Programme Analysis, Surveys and Mapping Branch, Ottawa.
Parker, J.H.	Deputy Commissioner, N.W.T., Yellowknife.
Parnell, J., B.C.L.S., M.L.S., D.L.S.	Underhill and Underhill, Vancouver, B.C.
Paton, O.C.	Staff, Supervising Mining Recorder, Yukon.
Pearmain, D.	Technical Draftsman, Staff of the Surveyor General, Victoria, B.C.
Rain, Hector	Prospector, Yukon Territory, Whitehorse.
Ralfs, A.H., B.C.L.S., D.L.S.	Surveyor General of British Columbia.
Rankin, J.J.	Ranworth Explorations Ltd., Toronto.
Richards, J.	Assistant to the Deputy Minister of Mines, Manitoba, Winnipeg.
Rippon, T.E., A.L.S., D.L.S.	Surveyor, Land Titles Office, Edmonton.
Roberts, A.C.	Director of Surveys, Manitoba, Winnipeg.
Roberts, Willis F., N.B.L.S.	Director, Lands Branch, Dept. of Natural Resources, N.B., Fredericton.
Roper, J.S.	Director of Mines, Dept. of Mines, Manitoba, Winnipeg.
Schwartz, W.M., S.L.S., D.L.S.	Controller of Surveys, Saskatchewan, Regina.
Scott, Ralph V.	Director, Mining Lands Branch, Dept. of Mines, Ontario, Toronto, now Director, Northern Affairs Branch of that Department.
Seaton, R.A.	Director, Minerals Branch, Dept. of Mines and Minerals, Alberta, Edmonton.
Sebert, L.M.	Chief, Special Projects, Surveys and Mapping Branch, Ottawa.

Sharpe, J.W., B.C.L.S.	Underhill and Underhill, Vancouver, B.C.
Shaw, J.C.	United Asbestos Corp. Ltd., Montreal.
Simard, R.J.	Supervising Mining Recorder, N.W.T., Dept. of Indian Affairs and Northern Development, Ottawa.
Smith, George J., B.C.L.S.	McElhanney Associates, Vancouver, B.C.
Somerville, H.H.	Deputy Minister, Dept. of Mines and Minerals, Alberta, Edmonton.
Sutherland, D.R., A.L.S., D.L.S.	Canadian Engineering Surveys Ltd., Edmonton.
Sheridan, D.J.	Director, Mineral Records, Dept. of Natural Resources, Saskatchewan, Regina.
Spence, W.I. N.B.L.S.	Administrative Assistant to the Mines Commissioner, New Brunswick, Fredericton.
Thibault, C.	Dept. of Natural Resources, Quebec.
Thistlethwaite, R., D.L.S., B.C.L.S.	Surveyor General of Canada, Ottawa.
Underhill, J.T., B.C.L.S.	Underhill and Underhill, Vancouver, B.C.
Wagner, T.F.	Supervisor of Land Records, Dept. of Natural Resources, Saskatchewan, Regina.
Weir, C.H., A.L.S., D.L.S.	Stewart, Weir, Stewart and Watson, Edmonton.
Welter, Fred	Staff, Northwest Surveys Corporation Ltd., Whitehorse, Yukon Territory.
Whyard, J.H., C.E.	Staff, Supervising Mining Recorder, Whitehorse, Y.T.
Viminitz, Max, S.L.S.	Chief Surveyor, Land Titles Office, Regina, Saskatchewan.
Youngs, C.W., A.L.S., D.L.S.	Director of Surveys of Alberta, Dept. of Highways and Transport, Edmonton.

CREDIT:

Map reproduction for this study has been the work of George Wood, Surveys and Mapping Branch, Ottawa.

BIBLIOGRAPHY

Digest of Mineral Laws of Canada E.C. Hodgson
Mineral Report No. 13 (6th edition)
Department of Energy, Mines and Resources

Mining in the North, 1967,
Department of Indian Affairs and Northern Development,
Queen's Printer, Ottawa.

The Yukon Territory, Its History and Resources,
Government Printing Bureau,
Ottawa, 1907.

Canada North of 60,
Department of Indian Affairs and Northern Development,
Queen's Printer, Ottawa, 1969.

Canadian Mining Journal,
Vol. 69, No. 10, October, 1948,
"Mining in Quebec" by A.O. Dufresne,
also Vol. 90, No. 4, April, 1969.

Actualite, October, 1969,
Drummondville, P.Q.

Surveying and Mapping Colloquium for the Petroleum Industry,
October, 1969,
University of Alberta,
Banff, Alberta.

Prospecting in Canada A.H. Lang
Economic Geology Series, No. 7, 1930-1966,
Department of Mines and Technical Surveys,
The Queen's Printer, Ottawa.

Every Square Inch L.M. Sebert
Department of Energy, Mines and Resources, 1970,
The Queen's Printer, Ottawa.

Photogeology and Regional Mapping J.A.E. Allum
Pergamon Press, 1966,
London, England.

PART 2

SUMMARY and CONCLUSIONS

SYNOPSIS OF THE SURVEYING AND CLAIMING PROBLEMS IN CANADA

The first part of this two-part report presented the results of fact-gathering activities authorized under this study. The origins and purposes of this inquiry were described in Part One and highlights of the historical development of mineral claim acquisition rights were traced in each province and territory of Canada. Laws and regulations applied in each of the jurisdictions involved were catalogued in considerable detail. The general climate of Canadian judicial interpretation of those legal provisions was indicated, a portrayal based upon court rulings in cases of special significance in the field covered by this study. Location procedures in regard to petroleum and natural gas properties, both onshore and offshore, were outlined by way of analogy with, or in contrast to exploration and claiming practices applicable to hardrock mineral claims. Part One ended in a summary of attitudes, trends, and conditions common to most regions of the nation in regard to those issues arising out of the increasing inadequacy of traditional procedures as well as of outmoded tools and transport to serve efficiently the mounting needs for Canadian hardrock mineral development in the years ahead.

Despite rather scanty historical records and narratives available in this realm of Canadian enterprise it is obvious that from the earliest stages of European exploration and settlement of lands now included in Canada's domain, the manner in which mineral rights could be acquired and used by individuals or groups of individuals played a dynamic part in the economic progress of the northern half of North America. Canada's growth toward full nationhood was slow and rather hesitant until the immense extent of its mineral and other natural resources became widely known. Much of this country would have remained untravelled wilderness for much longer periods of time than has been the case but for the enterprise, daring and durability of explorers and mine-hunters. Equipped with only the crudest sort of instruments, imperfect maps, and using primitive modes of transportation, such men conquered rough, forbidding terrain and extreme severities of climate to produce, in a number of instances, highly spectacular results. One of the earliest incidents relating to this phenomenon concerns the concession granted

in 1654 by Louis the Fourteenth of France, made to Nicholas Denys, authorizing the latter person to search for and to produce minerals in Cape Breton, a grant that led to the discovery of important coal beds in what is now part of the Province of Nova Scotia.

Beginning with the dawn of the 18th century, however, a large and complex body of statutory requirements, laws and regulations, (under which mineral rights have been or are being acquired and kept in good standing) has grown up in Canada, a nation now consisting of ten provinces, two territories and a federal authority. Details of such requirements and of other legal provisions, including surveying functions, vary somewhat from jurisdiction to jurisdiction. An examination of this intricate structure, on any conventional historical basis, resembles a study of fog. Here and there, in files of correspondence and other records, one comes upon tiny pools of enlightenment in the form of brief explanations of legislative actions taken, patches of illumination that help to mitigate the general murk and which also aid in making research meaningful and value-judgments more accurate. Together, the tasks involved in this inquiry constitute a project of formidable proportions. These include efforts to clarify the significance of periodic trends in law-making as well as to try to analyze the philosophical and other motivating forces bringing about improvements.

Mining in Canada, more than 300 years after the award of the pioneer Denys concession, has become not only one of the primary industries of this country but a highly important growth industry as well. It has achieved this status because early developers succeeded in uncovering sources of natural wealth the extent of which surpassed all expectations. In years yet to come it is certain that the barriers of time and geography that have made economic progress in this nation so difficult of accomplishment, will be surmounted steadily as technological frontiers are persistently pushed back. By the increased use of new tools and of improved aircraft the continuing process of opening up Canada's hinterland to development will be expedited and made more efficient. This process will expand to include areas previously ignored because of extremely difficult terrain, remoteness from settlement, or because of deep overburden concealing the existence of important new sources

of mineral wealth. Canada's Arctic regions are even now undergoing intensive examination as transportation facilities improve along with refinements of exploration equipment. Metallic minerals as well as other types of mineral wealth in that region are becoming daily more accessible. The full extent of mineral resources under Canada's coastal waters remains unknown. All of these stirring possibilities form an abstract but powerful magnet attracting the application of some of the better qualities of the human mind and spirit.

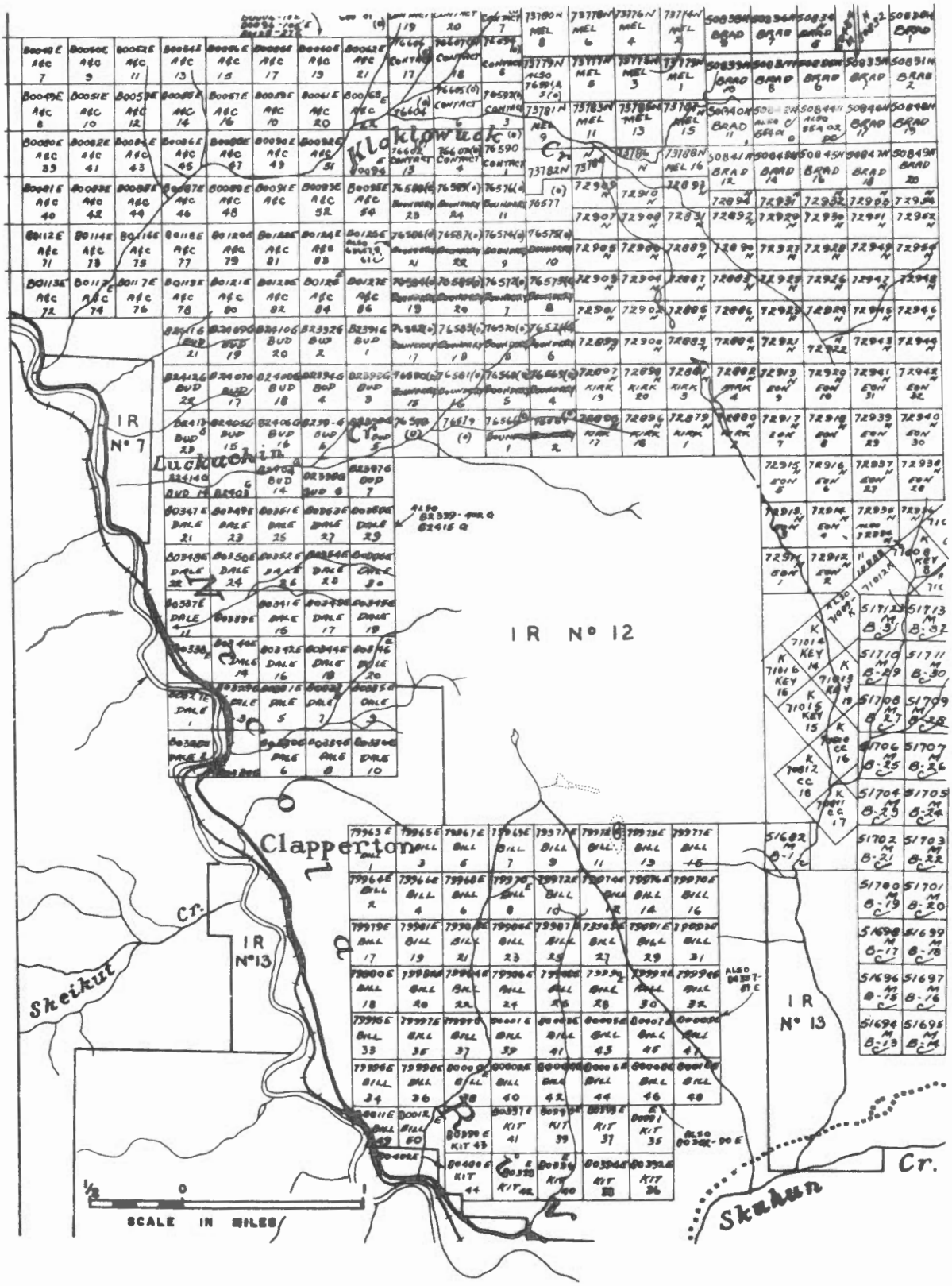
In Canada, generally, mineral rights from the outset of development have been conveyed from the Crown to the recipient on a claiming basis. For many years such rights were alienated from the Crown by means of freehold grants of mineral lands but in more recent times this type of transfer has been accomplished almost entirely by the issuing of leases. The individual prospector, as a rule, was the discoverer of what he considered to be an area of potential worth in terms of mineral production and so became entitled, under the law, to stake a claim thereto. It is relevant to observe, at this point, that the practice of ground staking commenced when mapping of mining regions of Canada was inadequate if, indeed, it existed at all. At present, in most instances, before a prospector can obtain a lease of property for the purpose of extracting minerals therefrom he is required to have a legal survey made of that property in order to provide conclusive evidence of the extent of his holding. This procedure has involved the production of plans and monumentation. Such evidence provides the formal foundation for any official permission to proceed to the development of resources contained in the property claimed.

The main question that arises as a result of this study is this - have we in Canada now reached a stage in national growth that we should insist upon becoming beneficiaries of progress made in the world at large and, accordingly, modernize our claiming and surveying practices in relation to the development of mineral resources? It may be argued that the hinterland of Canada is not yet ready for the application of any new methods in this respect. But the question persists - should we in Canada decline to participate in advantages accruing from hard-won progress in the spheres of surveying, mapping, air photography, instrumentation and transportation?

These improvements represent the fruit of many decades of civilization and offer, at least under some conditions, a relatively new and more effective process of acquiring mineral rights. The practicality of answers to such questions depends, of course, upon the availability of funds to make possible the introduction in Canada of any new method.

This inquiry has been inspired by the expectation that a completely new look would be taken at Canadian surveying procedures as applied to mineral properties. Because such practices are so closely allied with claiming procedures this study must include methods of acquiring mineral rights in this country. This inquiry is undertaken, therefore, with a view to achieving whatever may be practical and possible in simplifying, modernizing and standardizing such procedures, including proposals for the removal of needless duplications, anomalies and incongruities in the application of existing laws, regulations and instructions in this field of activity. Not only surveyors but administrative officials and growing numbers of developers in the mining industry of Canada are restive over the mounting jumble in this country of laws, regulations and official instructions featured, all too often, by illogicality, anomalies, conflicts of purpose and, in some instances, by sheer obsolescence.

It is conceded by its staunchest supporters that the conventional ground-staking method of acquiring mineral property rights is not free from inherent imperfections. They compare its general effectiveness, however, with that of the system of government known as "democracy", a system also admittedly imperfect and often untidy in its functioning but which, none the less, does work in actual practice. This attitude is somewhat more tolerant than the conclusion of the distinguished historian, D.W. Brogan, who observed that "democracy is like a raft. It never sinks but, damn it, our feet are always in the water!" In any event the democratic system is being constantly overhauled and improved in rather important respects including, over the years, the elimination of "pocket boroughs", the streamlining of parliamentary procedures including limitations on debates, the imposition of stricter controls over gerrymandering of constituencies as well as other advancements in bringing about more equitable representation of the people in parliaments.



Portion of mineral claim map sheet, Kamloops Mining Division, B.C.

Why, then, should a system of locating mineral properties be immune from or impervious to progressive, even radical, improvement?

Many of the arguments arrayed against any change from the existing staking and claiming system were assembled also against the introduction of the Torrens system of land registration and land tenure. Nevertheless the people directly involved in the process in effect prior to the proposals of Torrens experienced undue costs, loss of time, and considerable perplexity. These were the inevitable consequences of the perpetuation of a system that was cumbersome and quite unsuited to conditions of the times into which society had progressed.

There is substantial agreement among departmental (mines) administrators, land surveyors, and mineral property developers that before any map selection system of locating claims can be introduced in Canada as a practical step forward and as an alternative to the traditional staking on the ground, a much greater density of geodetic ground control must be provided than now obtains in this country, especially in the northern portions of the four western provinces as well as north of the 60th parallel of latitude. It is generally agreed that another condition precedent to the application of any new system of this sort is the provision of more detailed mapping, on a suitable scale, than now exists in regard to these regions. Adequate mapping, of course, implies the prior provision of a serviceable geodetic control net.

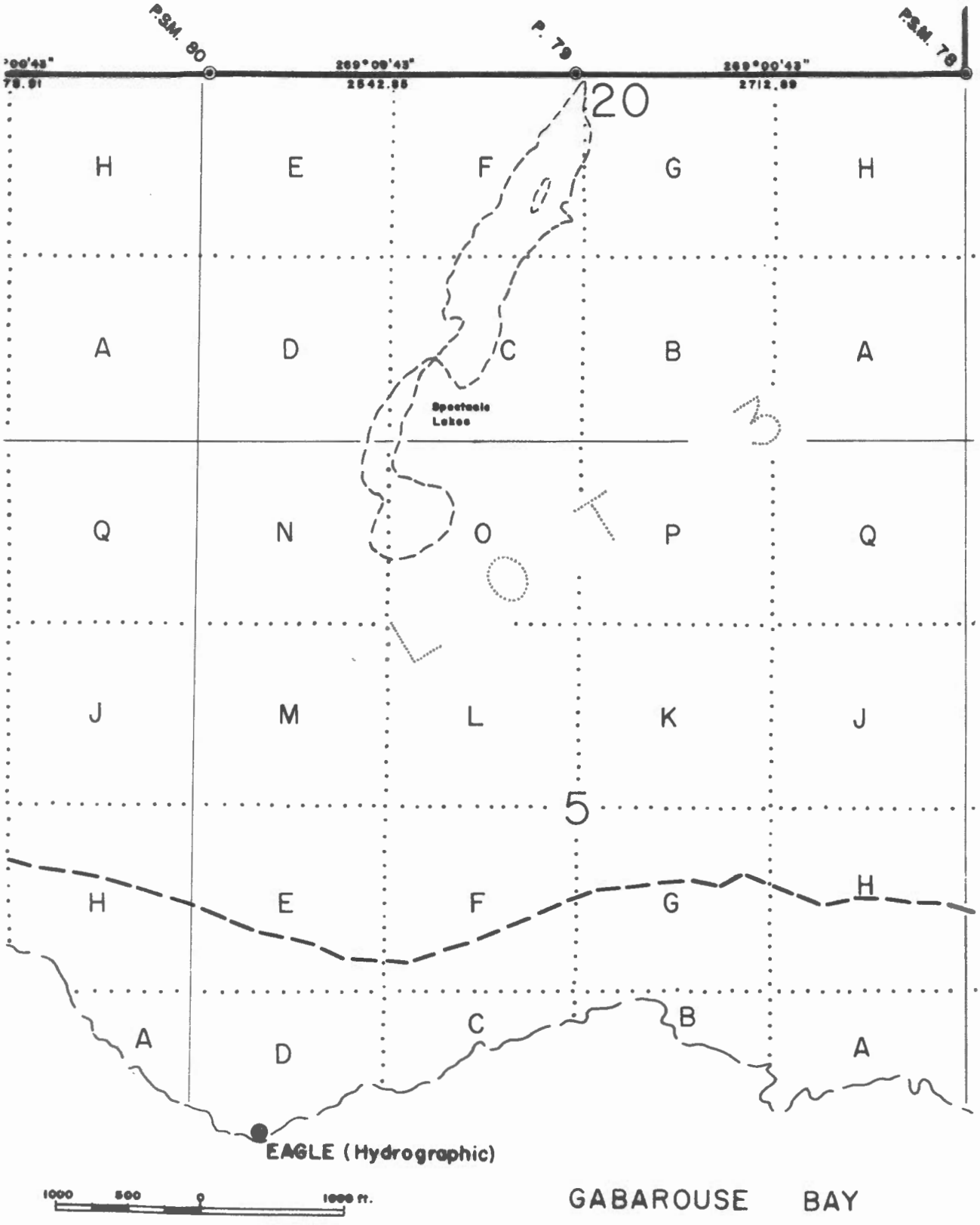
Although the total number of individual prospectors, those whose main income is derived from prospecting activity, is not large in Canada at present, the number of casual or part-time prospectors is quite considerable. Those who win fame and fortune in their searches for mineral wealth are relatively few. Yet stories of these rare but impressive successes serve to spur others in their determination to keep seeking "the big find". Among developers it is widely believed that the lone prospector, operating on a modest grubstake, is indispensable now and in the foreseeable future to the successful prosecution of the quest for new mineral wealth in Canada. He, it is asserted, is the one who will be most assiduous in exploring with care the remotest nooks and crannies in the roughest terrain, obscure places which college-trained prospectors equipped with highly sophisticated instruments and flying in

fixed-wing aircraft or helicopters might possibly neglect to investigate closely. The majority of those inside and outside the mining and mine-hunting industry are anxious that opportunities for the functioning of individual prospectors be fully preserved, whether or not a new system of locating mineral properties is adopted. It is difficult to envisage any new system so scientifically perfect and productive as to be independent of the special contribution that individual prospectors can make to the advancement of the mining industry and to the progress of the nation.

"If prospectors are to be successful their training and knowledge must be up-dated, as in most other callings ... Tomorrow's prospector must be better trained than his counterpart in the past. He needs instruction, perhaps on an annual basis, in geology, mineralogy, geophysics and geochemistry. The latest knowledge in each of these subjects is of increasing importance to aid in discovering ore deposits ... He needs also sound instruction in the use of prospecting instruments and techniques which are continually being improved..."

These observations were made by the Select Committee on Mining of the Ontario Legislature in its 1964 Report. It recalled that classes for prospectors, sponsored by the Ontario Department of Mines, had been held annually in Toronto and Port Arthur (Thunder Bay) for a number of years as well as from time to time in other places in the province. The committee recommended that a class for prospectors continue to be held annually in Toronto and that these facilities be expanded when advisable. It recommended also in the home area of each Resident Geologist that "a class for prospectors be conducted". This proposal has since been implemented in some areas.

In view of the growing attention being given to the advantages of a map selection system in locating mineral properties in Canada the question arises - is it realistic to expect prospectors to become adept, with training, in map-reading and in interpreting air photographs to the extent that they can master the mechanics of such a system? The Ontario proposal appears to contemplate the education of prospectors in subjects at least as complex as map reading and air photo interpretation. For the past fifty years courses



Part of Plan of Survey of Landward Boundaries, Lot 3, near Louisbourg, N.S.

have been conducted each winter in Vancouver titled, "Prospectors' Mining School" under the joint sponsorship of the B.C. and Yukon Chamber of Mines and the Provincial Department of Mines and Petroleum Resources in co-operation with the Adult Education Department of the Vancouver School Board and the University of British Columbia. These courses have been organized to train individuals in prospecting and to provide them with a knowledge of staking and recording mineral claims, mineralogy, geology, mining methods, testing of materials, and other subjects of practical aid to the prospector in the field. In the light of these apparently successful educational ventures it should not be beyond the capacity of either experienced or budding prospectors to master the fundamentals of map reading and air photo interpretation as aids in locating their claims by means of map selection (map staking).

The regulation of prospecting, mineral rights, staking, recording and surveying of mineral properties is vested in the various provincial governments and in the administrations of the two territories. There is not a uniform law governing these matters applicable all across Canada. This lack of uniformity arises out of several causes and conditions. Some laws and regulations took form when the original provinces of Confederation were separate colonies and when each such area became more autonomous, legal provisions were established to suit its own needs. Although statutory and other provisions in this field follow more or less the same pattern in the twelve jurisdictions now existing in Canada, these differ considerably in detail as can be discerned easily and quickly from scanning the summarizing pages contained in Part One of this report.

It would be simple and convenient for prospectors and developers of mineral properties to be governed by the same law and regulations regardless of their location in Canada. Undoubtedly their operations would be simplified greatly if only one set of rules was applicable across the entire country. The work of offices of the Surveyor General (Canada) and of Dominion Land Surveyors in the field, for example, would benefit from greater uniformity of regulations covering the acquisition of mineral rights in the two Territories of northern Canada. Although the goal of general uniformity,

as between the jurisdictions, may be desirable in regulating this type of enterprise (and should be kept constantly in mind as a desirable national goal) any relatively short-term campaign, designed specifically to impose from a superior authority complete or nearly complete standardization of this sort would not likely succeed in its purpose. It is more probable that a growing measure of uniformity will emerge in the manner suggested in the 1968 proceedings, Conference of Provincial Ministers of Mines, pp. 68-69:

"The standardization of laws and regulations concerning the acquisition of mining rights throughout Canada has been desired all along and it is achieved automatically through formal amendments of mining acts in various provinces. Indeed each time a province wants to amend its mining law it takes advantage of the experiences of other provinces in the same field with the final result that there is a tendency towards uniformity. Such differences as may remain are due to the basic fact that mining laws are provincial matters, as mentioned in the British North America Act."

If, however, each of the provinces and territories decided to make use of a map selection system in the locating of mineral properties, a considerable measure of uniformity would be created as a consequence throughout all the jurisdictions in the nation.

SUMMARY

1. There is general agreement that the availability of more detailed mapping on a fairly large scale in all parts of Canada is imperative before a map selection system can be adopted throughout the country for the purpose of locating mineral properties in the first instance. It is also generally realized that the accomplishment of such mapping is dependent, in turn, upon the provision of minimum required control across the nation.

2. It is the consensus also that, having regard to existing cost and other limitations, the 1:50,000 scale of mapping is the most feasible of any scale for use across the country in such a map selection system in the foreseeable future. It is this series in the N.T.S. that is considered to be the "working scale" in the mapping for development of Canada's natural resources.

The 1:125,000 scale, for example, is too small for the depiction of necessary detail. On the other hand the 1:25,000 scale results in maps too expensive (at present) to produce for vast areas and so, in Canada, is used only for cities and relatively densely settled areas. The 1:50,000 series, falling between the other scales mentioned, supplemented by larger scale mapping where available and useful, would appear to be the type of cartography on which a map selection system in Canada should be based if transition to such a system is to be accomplished in the present century.

3. At the present normal flow or pace of map production in Canada it is estimated that about 30 years will be required to complete 1:50,000 scale mapping throughout the nation, assuming that minimum required geodetic horizontal control is established. It is estimated in this connection that about 13,200 sheets will be required to complete 1:50,000 mapping in this country, of which total about 4,800 sheets have already been published, leaving a balance at this time of about 8,400 sheets. The present average output of these map sheets is approximately 300 per year.

4. At the present rate of progress federal geodetic survey authorities estimate that about 30 years will be required to complete coverage of all Canada by minimum horizontal control required for the purpose of 1:50,000 scale mapping. Some question exists as to whether vertical control work could be completed for the whole country within that span of time. In any event this latter factor is not so vitally important as horizontal control to the viability of the map selection system. (See Geodetic Survey of Canada work summary maps included in this report.)

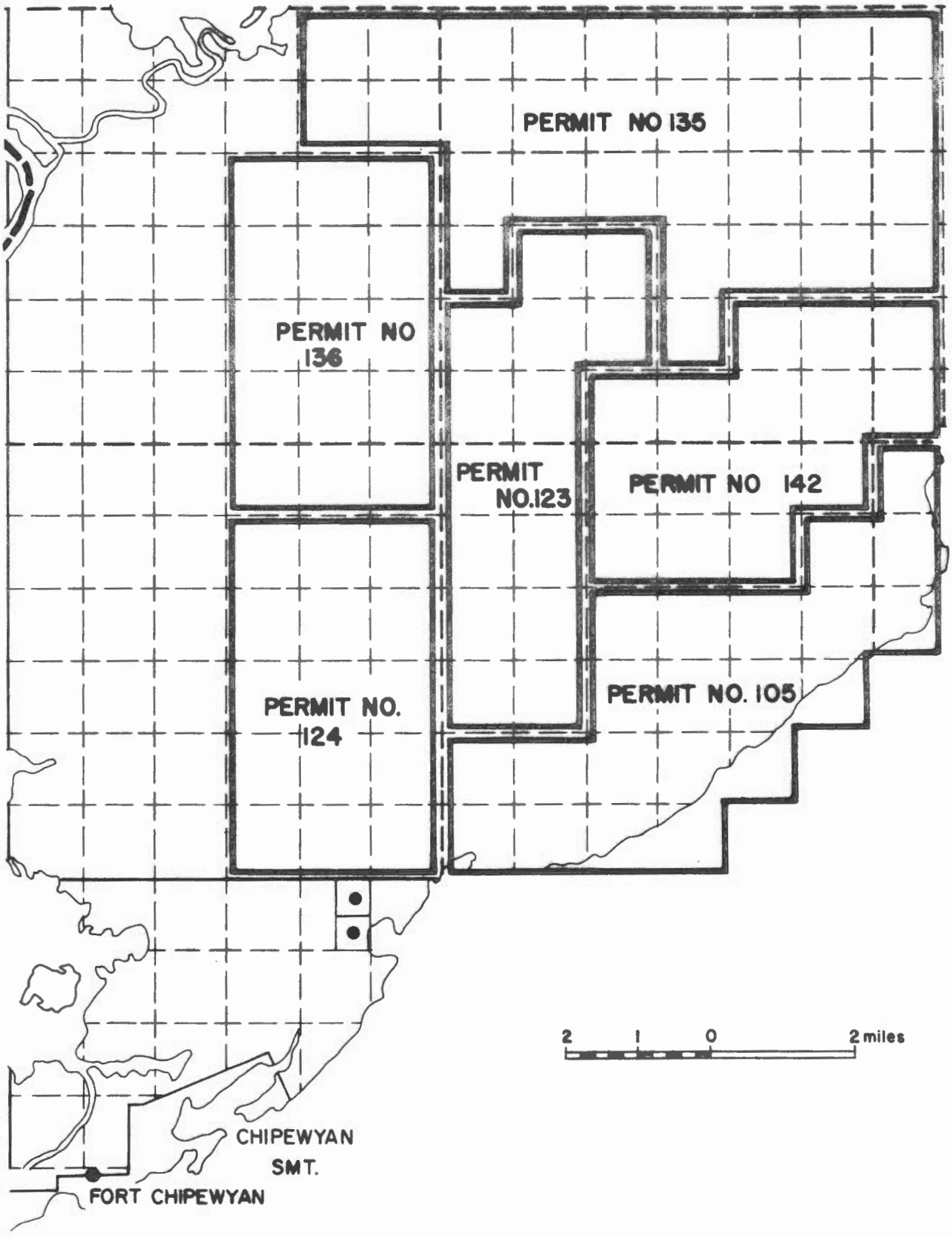
In order to reduce the period of time involved in the surveying and mapping required for any viable map selection system and, assuming that increased sums of money would be voted by Parliament to make possible the acceleration of existing programs, certain priorities need to be established. Under such agreed-upon priorities it could be provided, for example, that the 1:50,000 scale mapping campaign be concentrated upon the principal mineralized areas of Canada until the coverage of such areas is completed; also that a decision be made concerning the extent to which the private mapping industry

in this country could participate in the campaign; on the extent also to which British Columbia might assist with its map-making facilities. Consideration might also be given to the possible use, for the purpose of map selection of mineral properties, of maps in a stage less refined than that required for final publication. There is also a real possibility that in connection with the developing use of satellite triangulation in fixing accurate positions on the earth's surface, the establishment of a geodetic net in Canada of the density necessary for map staking can be expedited to a considerable extent.

Map selection of hardrock mineral properties has been in effect in Nova Scotia and in Alberta for some time. Prince Edward Island is about to join those two provinces in establishing this system. Mining recorders in Nova Scotia and Alberta advise that thus far they have not encountered special problems in the administration of map selection procedures.

In various parts of Canada, including Nova Scotia and Alberta, map selection has also served effectively in petroleum and natural gas exploration ventures. Recently this system has been extended to similar operations offshore along our ocean coasts. This system of locating mineral properties, devised to provide for orderly development of oil and natural gas resources, provides a practical framework on which to base legal and administrative functions relating to leaseholds and such matters as the proper spacing of wells in a field. Ground staking is dispensed with as a vital ingredient in the locating process. There is no loss of security in relation to leasehold or permit rights. Usually definitive surveys are postponed until actual production of oil or gas occurs or is assured.

There is every likelihood that the same system will be applied in the search for hardrock minerals in offshore regions. There is room for debate over respective advantages of the two systems, that is, map selection versus ground staking, in the development on land of hardrock mineral resources. But there is not much scope for argument over which is the better method applicable to explorations for mineral wealth situate offshore from our ocean coasts. Actually the system of allocating mineral rights under the existing Canada Mining Regulations in regard to such submerged claims appears to be totally unworkable.



Portion of Lake Athabasca (Alberta) area mineral claim sheet.

CONCLUSIONS

A careful and considered examination and weighing of the various facts, factors, and opinions gathered during the course of this study suggest, on balance, the following principal conclusions:

1. Map selection of mineral properties in Canada, supplemented by the use of air photography, is a viable alternative system to the traditional practice of staking on the ground in the initial stage of the claiming procedure, provided that sufficiently extensive and reliably detailed map coverage of the nation, based upon the minimum required geodetic control has been made available.

2. In the light of cost and other factors the 1:50,000 scale of mapping, supplemented by larger scale mapping when such is in existence and useful in this context, appears to be the most feasible series in the N.T.S. for map selection of new mineral properties. (See Cartographic Considerations in Part One of this report.)

3. Unless steps are taken to accelerate existing horizontal geodetic control as well as the 1:50,000 scale mapping programs in this country, completion of the coverage required for map selection procedures will not occur until about 2000 A.D.

4. During the interval of time preceding any widespread adoption of map selection of mineral claims, experimental areas should be provided at least in each principal region of the nation by agreement among the governmental authorities in the jurisdictions directly involved. In these areas, each of them to be fairly representative or typical of physical conditions obtaining in that region, the map selection method could be fully tested over a period of several years and if any refinements should prove desirable, the system could be modified accordingly.

5. During this transition period lecture courses in map-reading and in air photo interpretation could be provided in "Schools for Prospectors" located in each of the aforementioned regions. In this manner the place of the individual prospector in any new system of mineral rights acquisition could be safeguarded and strengthened.

6. If the transition period, now estimated at 30 years, is to be reduced to any substantial extent then additional funds will need to be voted by Parliament to meet the cost of accelerating geodetic control as well as 1:50,000 scale mapping programs now under way.

7. There is substantial, if not unanimous, agreement across the country that a claim unit size larger than the prevailing 40-acre and 51.65-acre units ought to be established in order to render map selection of mineral properties more practicable. In areas of Canada featured by a combination of rugged terrain and the 2-post staking system, however, increasing the standard size of mineral claim poses special problems.

8. After the establishment of a map selection system in all jurisdictions or in a number of them it is anticipated that, to conform with newly-surveyed units, there will take place a gradual transformation of irregularly shaped mineral properties into units of standard shape and size and consequently into more orderly patterns of holdings. This expected development, in turn, could increase the feasibility of a single survey operation serving, in regard to one or more such units, as a basis for leasehold (or other) title to surface rights as well as to mineral rights in jurisdiction not now providing such dual-function surveys and in circumstances where the applicant seeks acquisition of both types of rights in relation to a specific property. Mineral survey plans ought to be made a matter of record in land titles or land registry offices so that such survey documents would be available for multiple use, including establishment or confirmation of title to surface rights, rather than retained by one agency of government for a single purpose or use.

9. For constitutional and other reasons any urge to bring about a larger measure of uniformity or standardization than now exists of surveying and mining laws and regulations across the country ought to originate in and be carried into effect by the governing authorities in each of the jurisdictions.

10. During the course of this study little criticism was expressed by those interviewed concerning the professional quality of surveying of mineral properties throughout Canada. Some complaints were voiced, however, over rising costs of such services.

11. Consideration ought to be given by authorities in each jurisdiction (on or before adoption of a map selection system) to making alterations in the fee structure obtaining in such jurisdiction and relating to mineral rights acquisition procedures. Such alterations should be designed to achieve greater equity between applicants and thus help to preserve and expand the place and function of the individual prospector in relation to large, wealthy prospecting corporations.

12. Adoption, on a broad basis, of map selection would obviate any need there might be otherwise to analyze in this report the relative merits of 2-post and 4-post staking on the ground. But in jurisdictions largely mountainous and featuring the 2-post system of staking the advantages of the map selection method may have less initial appeal than in other jurisdictions.

In November, 1970, Bill C-187 (Yukon Minerals Act), was introduced in the House of Commons, Ottawa. This measure constitutes a fairly extensive redrafting of the Yukon Quartz Mining Act because, apparently, the existing law has become out-dated, falling behind exploration techniques and in terminology. Redundant sections of the former Act will be removed. Under C-187, by inference, no limitation is imposed on the number of claims subject to staking by one applicant. The proxy staking provision is extended to include corporations as well as individuals. When the new bill becomes law, metal tags are to be provided prior to staking, thus eliminating an additional trip from recording office to claim site. The period for publicizing the survey of a claim is to be reduced to six weeks. For purposes of representation work, under provisions of C-187, a total of 36 claims may be grouped, an increase from 16 claims. Procedures in obtaining leases of mineral properties are simplified. The standard term of lease remains at 21 years, renewable for like periods but in special circumstances by Order in Council the initial term of lease may be extended to 42 years. New forms are being planned but these remain to be authorized under the new Act, when proclaimed. The Certificate of Improvements is to be discarded under the proposed legislation. By permission of a mining recorder a surveyor may move or destroy and re-establish a legal post when such action becomes necessary in the course of road-building, carrying on a mining operation, or in surveying a recorded claim. Provision is made for establishing regulations under this measure.

The report of a study of a computerized system of mineral claim-recording procedures, mineral claim data storage and retrieval forecasts the establishment in both northern territories of this method of providing improved and faster information retrieval as well as speedier replacement of any damaged records*. This new system constitutes an inventory-type operation rather than of any complex calculation of inter-relationships. Also there are indications that a system of microfilming of all original documents involved in mineral claim procedures will be instituted in the near future in the territories.

The Chairman of the National Advisory Committee on Control Surveys and Mapping has expressed the opinion that, in relation to the contents of Parts 1 and 2 of this report, the well-considered views of those especially concerned with the regulation and conduct of mineral property surveys would provide useful supplementary information. He has suggested, therefore, comments be invited, particularly on the observation made in a concluding paragraph of Part 2 that temporary experimental areas be designated by the appropriate authorities for the purpose of testing practical applications of map selection procedures under regional conditions.

* Report by R.J. Simard, Mining Section, Oil and Mineral Division, Department of Indian Affairs and Northern Development, November, 1970.