

Project Report  
RE-13-06-83

AN INVENTORY OF CHANGES IN  
ALBERTA'S AGRICULTURAL LAND BASE  
1981

Prepared By:  
Project Leader  
PETER WOLOSHYN  
Resource Economist

June, 1983  
Edmonton, Alberta

Resource Economics Branch  
Alberta Agriculture

## FOREWORD

The removal of agricultural land for urban and industrial uses has become a matter of great concern to those involved in agriculture, and to society in general. Because of a growing awareness of this conversion trend, fears have been generated that the agricultural productive capacity of Alberta is being affected.

To ensure that discussion of this topic is founded on reliable information, it was necessary to examine the issue in some detail. The initial study carried out in 1981 examined changes in the agricultural land base between 1976 and 1980. This current study is an update of the 1981 study and documents the changes which occurred in 1981.

Details on removals and additions of agricultural land for each of the six years are provided in the two studies. What is perhaps of greatest significance in terms of productive capacity, is the relative classes of lands being added to, or removed from, the agricultural land base.

It is hoped that this update will be of value to those involved in the design of government policy relating to the allocation and management of the limited land resource.

KATHLEEN MACDONALD  
Acting Branch Head  
Resource Economics Branch

## ACKNOWLEDGEMENTS

This report is a revised form of an earlier publication, "An Inventory of Changes in Alberta's Agricultural Land Base Between 1976 and 1980", by ALFRED BIRCH, Resource Economics Branch, March, 1982.

Also, grateful acknowledgement is made to all people who cooperated and assisted in contributing data for this study. The following agencies made data on agricultural land conversion available:

1. All of the Regional Planning Commissions (Peace River, Edmonton, Battle River, Red Deer, Calgary, Oldman River, Southeast Alberta and Palliser).
2. Alberta Municipal Affairs: Planning Services Division, Finance and Administration Division.
3. Alberta Energy and Natural Resources: Public Lands Division, Resource Evaluation and Planning Division.
4. Alberta Environment Land Reclamation Division.
5. Alberta Transportation: Regional Transportation Division.
6. Energy Resources Conservation Board.
7. Environment Council of Alberta.

Acknowledgement is also due to MEL MILLER who directed the collection for the 1981 data. The assistance of summer students involved in collecting the data is appreciated. Staff of the Resource Economics Branch provided typing and valuable comments and suggestions, particularly KATHLEEN MACDONALD who edited the final draft. KEITH TOOGOOD of the Computer Services Branch, Alberta Agriculture, lended invaluable assistance in data management and analysis.

I extend my sincere thanks to all of these.

## TABLE OF CONTENTS

	<u>PAGE</u>
FOREWORD .....	ii
ACKNOWLEDGEMENTS .....	iii
LIST OF TABLES .....	v
LIST OF FIGURES .....	vi
I INTRODUCTION	1
II DATA COLLECTION AND ANALYSIS	3
1. The Agricultural Land Base .....	3
2. Agricultural and Non-Agricultural Regions .....	4
3. Prior Use .....	4
4. Canada Land Inventory Classification .....	6
5. Public Land Dispositions and Reservations .....	7
6. Non-Agricultural Subdivisions .....	9
7. Urban Annexation .....	13
8. Roads .....	13
9. Oil and Gas Well Sites and Compressor Stations .....	14
10. Coal Strip Mines .....	17
11. Other Non-Agricultural Uses .....	18
12. Data Analysis .....	20
III ANALYTICAL RESULTS	21
1. Overview of Agricultural Land Base Changes .....	21
2. Public Land Dispositions and Reservations .....	33
3. Non-Agricultural Subdivision .....	37
4. Urban Annexations .....	47
5. Roads .....	50
6. Oil and Gas Well Sites and Compressor Stations .....	50
7. Coal Strip Mines .....	57
8. Other Non-Agricultural Uses .....	57
IV CONCLUSIONS & IMPLICATIONS	63

LIST OF TABLES

<u>TABLE</u>	<u>PAGE</u>
1 Summary of Agricultural Land Base Changes in Alberta, 1981 .....	22
2 Removal of Agricultural Land, Adjusted for Prior Use, 1981	23
3 Annual Agricultural Land Base Changes in Alberta 1976 - 1981 .....	25
4 Land Changes by C.L.I. Class, Alberta 1981 .....	26
5 Arable Land as a Proportion of Land Conversion, Alberta 1981 .....	27
6 Percentage Distribution of Land Conversion By Region, 1981	28
7 Land Base Changes in the Southern Region by C.L.I. Class, 1981 .....	29
8 Land Base Changes in the Central Region by C.L.I. Class, 1981 .....	30
9 Land Base Changes in the Northern Region by C.L.I. Class, 1981 .....	31
10 Land Base Changes in the Peace Region by C.L.I. Class, 1981	32
11 Permanent and Temporary Removals of Agricultural Land by Region and C.L.I. Class, 1981 .....	34
12 Annual Public Land Dispositions, Alberta 1976-1981 .....	35
13 Public Land Dispositions: Region, Type of Disposition and C.L.I. Class 1981 .....	36
14 Public Land Reservations: Region and C.L.I. Class, 1981 .	38
15 Non-Agricultural Subdivision: Intended Use and Year .....	39
16 Arable Land As Proportion of Non-Agricultural Subdivision, Alberta 1981 .....	41
17 Non-Agricultural Subdivision: Intended Use by C.L.I., 1981	42
18 Average Size of Subdivided Parcels, by Region and Intended Use, 1981 .....	44
19 Non-Agricultural Subdivision: Intended Use and Year, Edmonton-Calgary Corridor .....	45

<u>TABLE</u>	<u>PAGE</u>
20 Non-Agricultural Subdivisions: Intended Use and C.L.I. Class, Edmonton-Calgary Corridor, 1981 .....	46
21a Annexations: By C.L.I. Class and Arable Land as a Proportion of Annexed Land, 1981 .....	48
21b Arable Land as a Proportion of Urban Annexed Land, 1981	48
22 Annexations: By Year 1976-1981 .....	49
23 Annexations by Region, 1976-1980 Total and 1981 .....	49
24 Highways: Type of Use and Year, Alberta 1976-1981 .....	51
25 Highways: Type of Use and Region, 1981 .....	52
26 Highways: Type of Use and C.L.I. Class, Alberta, 1981 ...	53
27 Compressor Stations: Regional Breakdown into C.L.I. Classes, As of December, 1981 .....	55
28 Coal Strip Mines, Alberta, 1981 .....	56
29 Miles of Powerlines in Alberta: Year and Type .....	57
30 Miles of Pipelines in Alberta, 1981 .....	59
31 Railway Abandonment .....	60
32 Airport Acreages for 1981 .....	61
33 Total Inspected Gravel Pits Area as of 1982, by C.L.I. Class .....	62

#### LIST OF FIGURES

<u>FIGURE</u>	<u>PAGE</u>
1 Study Regions, 1981 .....	5
2 Statutory Boundaries of Regional Planning Areas, 1981 ...	10

CHAPTER I  
INTRODUCTION

This study is basically an update of Alfred Birch's 1976-80 "Inventory of Changes in Alberta's Agricultural Land Base" report. The 1976-80 report gave five years of comprehensive data showing the type and rate of land use conversion in the agricultural land base. The 1976-80 study generated much interest in farmland conversion, and as a result a 1981 update was requested.

The format of the previous report was followed closely and consistency retained where possible. Where sufficient information was available, the following information was coded on tape for analysis:

- a. Amount of land being converted to or from agriculture.
- b. Intended use of land being removed from agriculture.
- c. Date of recorded change in use (for subdivisions approval dates recorded).
- d. Legal description of the land being converted.
- e. The Canada Land Inventory Classification for agricultural purposes, of the affected land.

The following categories of land use conversion have been included on computer tape.

1. a) Dispositions of crown land for agricultural use.  
b) Abandoned oil and gas wells.

2. a) Approved subdivision of agricultural land for non-agricultural use.
- b) Annexation by urban areas.
- c) Rural road and highway construction and right-of-way extension.
- d) Oil and gas wells, and compressor (meter) stations.
- e) Public land reservations.
- \*f) Sand and gravel pits.

\* Data on computer tape, however, cumulative totals available only, that is no yearly breakdowns.

The following land use categories were dealt with separately and not included in the cross tabulations because of the lack of detailed information and/or because they constituted more of an inconvenience rather than a large loss of agricultural land.

- a) Powerlines
- b) Pipelines (buried)
- c) Railroads
- d) Airports
- e) Sand and gravel pits.

Details on the data collection procedures used are contained in the next chapter. Chapter III gives the analytical results with discussion, and Chapter IV contains conclusions.



CHAPTER II  
DATA COLLECTION AND ANALYSIS

The purpose of this chapter is to describe the methodology of data collection and analysis used in this study. Concepts such as "the agricultural land base" are discussed and the various categories of land conversion which this study employs are defined. This information will help the reader to interpret the results presented in Chapter III.

1. The Agricultural Land Base

This study attempts to measure changes in the agricultural land base, not the total amount of agricultural land. Below are the criteria used in this study for determining "agricultural land".

A large proportion of the land in Alberta has some agricultural potential, though much of the land which is not presently farmed would require improvement such as clearing or draining to bring it into production. Also, annual production costs would be high on some of this land. The main question concerns the economic feasibility of agricultural production, whether in cultivation or grazing. In order to measure changes in the province's agricultural land base, it would be desirable to identify those parcels where administrative or physical changes added or removed land on which agricultural production is economically feasible. Since economic feasibility could not be determined in this study, the approach used was to record administrative or physical changes affecting land where the present (for land removals), or probable (for land additions) use was agricultural. Present use was identified on a case-by-case basis where possible and on a probability or regional basis otherwise, as discussed below. Information on Canada Land Inventory (C.L.I.) classification was included only as a description of parcels being converted to or from agriculture. A number of factors affecting the definition of the agricultural land base are discussed in the remainder of this chapter.

## 2. Agricultural and Non-Agricultural Regions

For the purpose of administering provincial public land in Alberta, the Department of Energy and Natural Resources has defined several broad regions. In general, agricultural production takes place in the Peace Region (which is equivalent to the Energy and Natural Resources "yellow area") and in the "Northern", "Central", and "Southern" Regions (which together constitute the E.N.R. "white area")<sup>1</sup>. The remainder of the province (the E.N.R. "green area") consists mainly of non-settled forest lands. Provincial public lands in this area are managed primarily for forest production, watershed protection, recreation and wildlife. Some multiple use, including grazing, is also permitted. For the purposes of this study, conversions from agricultural to non-agricultural uses in the green area have been ignored. However, dispositions within the green zone of public lands into agriculture and restrictions on such dispositions have been recorded.

Also excluded from consideration in this study are Indian reservations, military areas (the Suffield Range and C.F.B. Wainwright) and land within incorporated urban centres.

## 3. Prior Use

In order to assess the amount of land being removed from the provincial agricultural land base, it is necessary to know the existing use of parcels prior to their conversion. All conversions to a

---

1. The regions in Figure 1 are defined for the purpose of this report only. The "Southern" region corresponds to Alberta Agriculture's Southern Region. The "Central" region corresponds to those parts of Agriculture's South Central and North Central Regions which are also in the E.N.R. white area. The "Northern" region corresponds to the parts of Agriculture's North Eastern and North Western Regions which are also in the white area. There is also approximate correspondence between the regions shown in Figure 1 and the Regional Planning Commission areas shown in Figure 2.

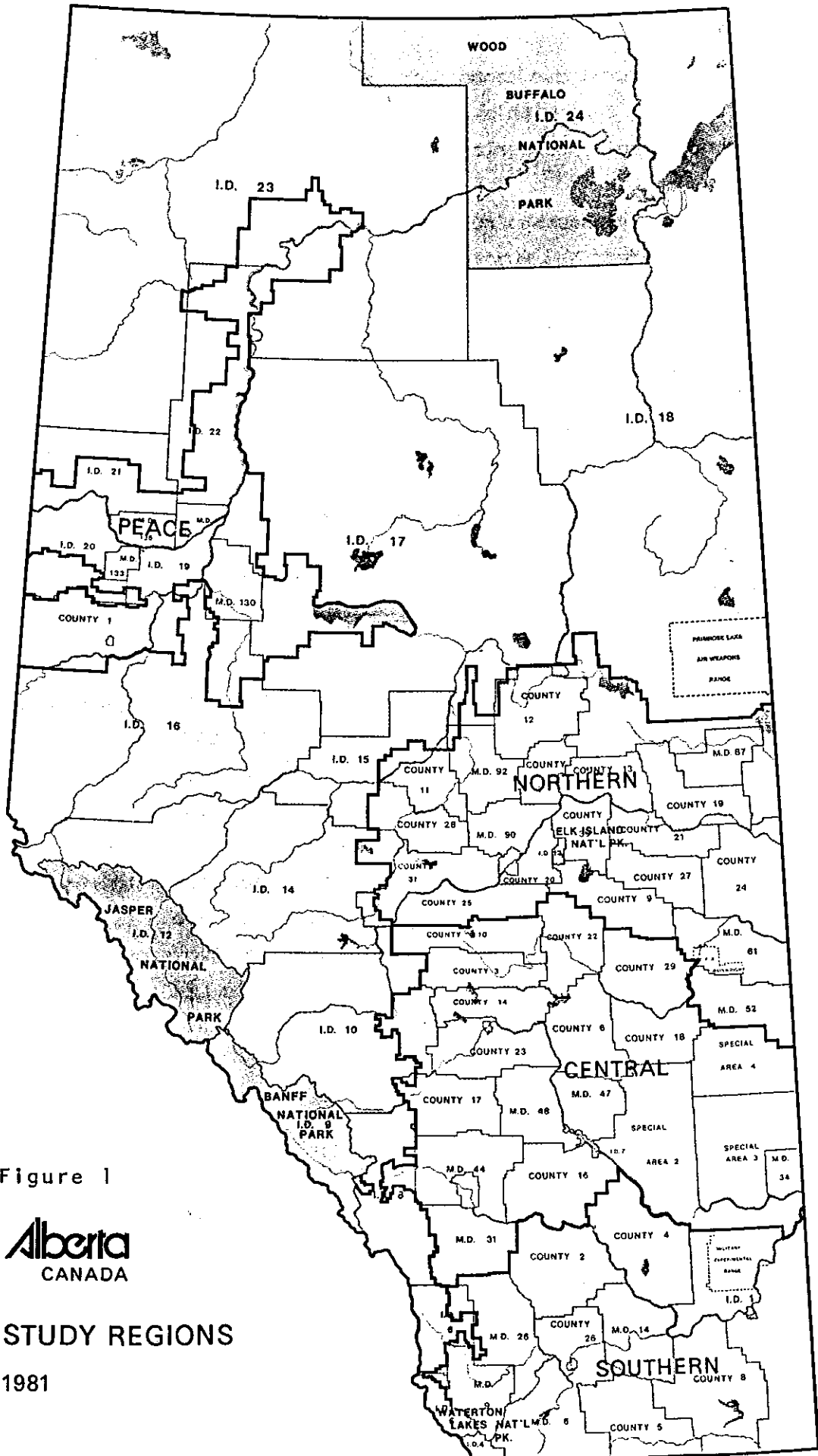


Figure 1

**Alberta**  
CANADA

**STUDY REGIONS**

1981

non-agricultural use cannot, for example, be assumed to remove land from agriculture; even within the "agricultural" areas of the province there is considerable non-agricultural land.

With respect to rural subdivision, the prior use of the land was determined from the subdivision application forms submitted to regional planning commissions or the Department of Municipal Affairs. It is recognized that there is some inaccuracy in identifying agricultural land by this procedure. Where subdivision involves a farm building site, there may be no actual loss of agricultural land, particularly where farm consolidation has taken place.

With respect to conversion to other non-agricultural uses such as highways, oil and gas well sites and urban annexation, case by case information on prior use was unavailable. An estimate was made of the ratio of agricultural land to non-agricultural land for each type of land conversion by examining aerial photographs and municipal assessment records for a sample of cases. It was determined, for example, that a higher percentage of the land used by oil and gas well sites is agricultural compared to the land used by highways and annexation to urban areas. Results are given in the next chapter.

Prior use considerations are also important with respect to public land dispositions. This study assumes that a temporary lapse in agricultural disposition does not constitute a loss of agricultural land. This is discussed further under "Public Lands Dispositions" below.

#### 4. Canada Land Inventory Classification

Information on the Canada Land Inventory (C.L.I.) classification of land being converted to or from agriculture was derived from one of two sources. First, many of the regional planning commissions' subdivision files contained C.L.I. information. In some cases, the C.L.I. class of the specific parcel or parcels concerned was available;

in other cases the predominant C.L.I. class for the entire quarter section had to be used. Second, in the remaining subdivision cases and in all other conversion categories (eg. urban annexation, well sites, highways) the C.L.I. information was obtained from the Department of Municipal Affairs and matched with this study's data on the basis of legal descriptions of parcels. The Municipal Affairs "Landup" program lists C.L.I. class and subclass information on a quarter section basis, derived from C.L.I. maps of 1:50,000 scale (and in a few cases, 1:250,000 scale). Use of this information in the present study involved the assumption that predominant C.L.I. class applied to the entire quarter section.

In some cases, the use of large scale maps or the use of a single C.L.I. class for a quarter section may have biased the C.L.I. measures in this report. Rural subdivisions are an example of this. To the extent that planning commissions are successful in directing subdivision onto land of lower agricultural capability, there is an incentive for applicants to select sites for development on such land. However, where these sites are on quarter sections which have predominantly higher agricultural capability soils, the subdivision sites themselves will be reported as having a higher C.L.I. class than is actually the case. The opposite type of bias may take place in the case of well sites. Oil and gas companies are likely to have an incentive to select locations within quarter sections where drilling sites are on land which is clear, level and well drained, i.e. on higher C.L.I. land. The reported C.L.I. may be lower however, reflecting the rest of the quarter section. The result may be that the C.L.I. ratings in this report are somewhat overestimated for subdivisions and somewhat underestimated for well sites. There does not appear to be the same probability of bias in the other conversion categories such as roads, urban annexation or strip mines.

##### 5. Public Land Dispositions and Reservations

Data on the dispositions and reservations on public lands in Alberta for agricultural purposes was collected from the Public Lands Division of Alberta Energy and Natural Resources. Data was collected

for the following disposition categories:<sup>1</sup>

- A - Farm Development Sale
- B - Civilian Homestead Sale
- C - Farm Development Lease
- D - Grazing Permits
- E - Cultivation Permits
- F - Forest Grazing Leases
- G - Multi Use
- H - Grazing Reserves

A and B are dispositions which lead to a transfer of a legal title. C through G are permits and leases which do not lead to transfer of legal title. H, Grazing Reserves, are community pastures which are financed, developed and managed by the Public Lands Division. The Special Areas Board administers the disposition of public land in the Special Areas.

It was impractical to collect data within the standard format on one additional disposition category: Grazing (or Ranch) leases. Record keeping procedures for Grazing Leases made it impossible to distinguish between new and renewed leases on a case-by-case basis, and thus impossible to accurately report additions to the agricultural land base on a yearly basis.

Changes from one agricultural disposition category to another were not counted as new agricultural land. Lapses between successive agricultural dispositions were not recorded as reductions and later as increases in the agricultural land base. For the purposes of this study, a period of 20 years was chosen as the minimum lapse after which an agricultural disposition would be counted as new agricultural land.

---

1. Further information on these categories can be obtained from the Public Lands Division, "Alberta Public Lands" ENR, Resource Information Service, 9915-108 Street, Edmonton, Alberta.

As part of the management of public lands, reservations (i.e. use restrictions) are placed on certain parcels by the Public Lands Division. These reservations may specify such things as no agricultural use of a portion of a quarter section prior to initial disposition, or temporary removal from grazing in order to restore native forages, or some change in multiple use management. Reservations are for varying periods of time but all are reviewed on a regular basis. Those reservations which clearly do not involve the removal of agricultural land (such as reservations prior to the initial disposition) are not reported in the study. Those which involve a break in production for some period of time are reported, though it should be kept in mind that they may not actually constitute a reduction in the agricultural land base. This is in line with the assumption, stated above, that lapses of 20 years or less between agricultural dispositions do not constitute a loss of agricultural land.

#### 6. Non-Agricultural Subdivisions

There were nine regional planning commissions in Alberta, each of which is responsible for subdivision approval in an area of the province<sup>1</sup>. These commissions are as follows:

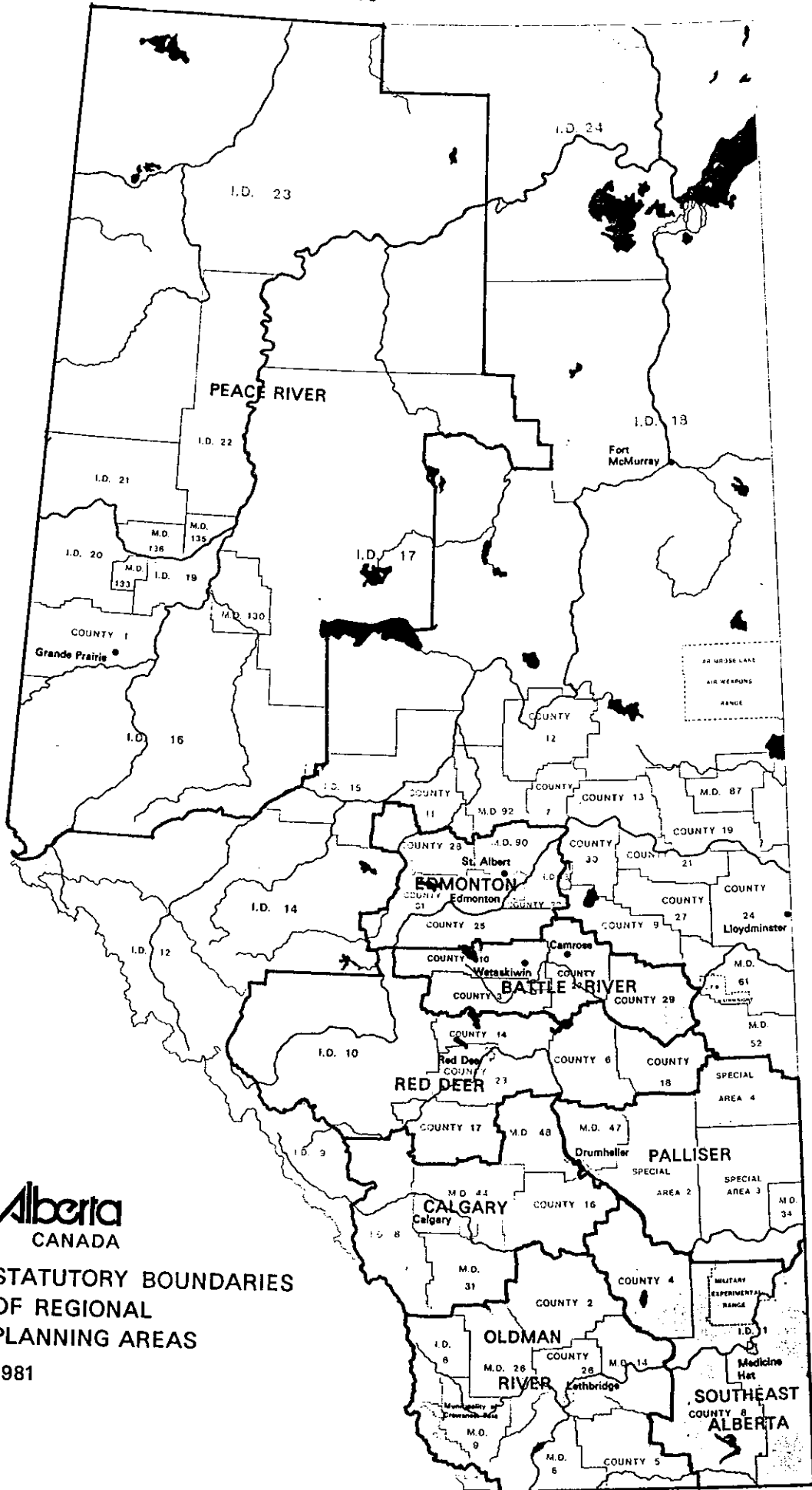
- Peace River (in Grande Prairie)
- Edmonton
- Calgary
- Battle River (in Wetaskiwin)
- Parkland (in Stony Plain)<sup>2</sup>
- Oldman (in Lethbridge)
- Southeast Alberta (in Medicine Hat)
- Palliser (in Hanna)
- Red Deer

The remaining rural portion of the province is handled by the Planning Services Division of Alberta Municipal Affairs. Subdivision appeals are heard by the Alberta Planning Board.

---

1. See Figure 2.

2. Parkland obtained subdivision approval authority April 9, 1981.



**Alberta**  
CANADA

**STATUTORY BOUNDARIES  
OF REGIONAL  
PLANNING AREAS**

1981



The subdivision procedure in Alberta involves a number of stages. These are: application, consideration and ruling by the approving authority, appeal to the Planning Board in some cases, endorsement of plans, and registration with a Land Titles Office where approval is given.

Data from the Planning Commissions were collected in two segments. The first segment (Jan. 80 - April 81) was collected along with data for the 1976-80 inventory report. These data were primarily collected on the basis of endorsements and/or registration<sup>1</sup>. The date of approval rather than endorsement or registration was recorded in some cases. The second segment of data (May 81 - Dec 81), was collected on the basis of approvals only, with the date of approval recorded. A check was done to determine the approximate percentage of cases which follow the approved stage through to registration with land titles. These data are given in Chapter III.

In all cases the prior or existing use of the parcels in question was checked. Only those parcels where prior use was agriculture (or in a small number of cases, vacant land) were recorded. It is recognized that there is some inaccuracy in this procedure, as indicated in the discussion of prior use. Farm building sites or wooded areas may be reported as being currently in agriculture, causing an overestimate of the loss of agricultural land. However, this study's definition of the agricultural land base includes land which, with little or no further improvement, has immediate agricultural potential even if it is not currently supporting production. Inclusion of such land therefore, is appropriate.

Some agriculture to non-agriculture conversions do not require subdivision approval and are therefore not included in this study. These include conversion of entire parcels without the creation of one or more new titles, or the creation of separate titles to fragmented parcels caused by a physical barrier such as a road or railroad. Subdivisions in which the intended use remains agricultural were recorded but were not reported in this study since they do not constitute a loss of agricultural land.

---

1. See "An Inventory of Changes in Alberta's Agriculture Land Base Between 1976 and 1980", Alfred Birch, Resource Economics Branch, Alberta Agriculture, March, 1982. P. 15 (explanation of previous collection procedures).

Information on the intended use of subdivided land, as reported on the subdivision application form, was recorded for each case. The following categories were distinguished:

- a) Single and multi-parcel country residence. Subdivisions for residential purposes. The Subdivision Regulations under the Planning Act, 1977, place a 10 acre limit on such parcels, though the Planning Board can grant exceptions. Prior to 1978 country residence parcels were permitted up to 20 acres.
- b) Farmstead separation. Also for residential purposes, but distinguished from "country residence" category by the presence of existing farm buildings.
- c) Commercial/industrial. Subdivision for such purposes as the development of industrial plants, warehouses, highways, commercial sites, private airfields, resorts, etc., in accordance with municipal zoning and regional plans.
- d) Public/institutional. Includes such uses as churches, parks, cemeteries, community centers, municipal airfields, etc.
- e) Private recreation. Subdivision for stated recreation use such as horse stables.
- f) Other. Includes such things as community well, wildlife conservation, etc.

The distinction between agricultural and non-agricultural uses of subdivided land is difficult to draw, particularly when this distinction is based on stated intentions at the time of making a subdivision application. The stated acreage taken by the country residence, farmstead separation and private recreation categories may overestimate the impact on the agricultural land base since some production may take place on these parcels, though often at a lower intensity. Acreage going to farmstead separation may also overestimate the impact on agriculture since much of this land was not involved in agricultural production prior to subdivision.

## 7. Urban Annexation

Annexation approval authority is held by the Local Authorities Board subject to Cabinet approval. For this study information on Board annexation decisions was collected from the Planning Services Division of Alberta Municipal Affairs. The files which were used contained both published information and maps (1:2400 and 1:7200 scale) showing annexed areas. Information on the amount of land (acreage) annexed by urban areas was not available in published form and so had to be determined from the maps by use of a planimeter.

Information on the prior use of annexed land was unavailable in published form. An estimate of the ratio of agricultural to non-agricultural land annexed by urban centers was derived from aerial photographs and municipal tax assessment records. This ratio is reported in Chapter III.

Finally, the assumption was made that all land annexed by urban areas was removed from agriculture on the date of annexation. Although this is clearly not the case, the assumption was necessary within the limits of this study. In the long run such an assumption would be reasonable since land is gradually developed for non-agricultural use following annexation. In the short run, there is an overestimate of the impact of annexation on agricultural production in this study.

## 8. Roads

The Property Services Branch of Alberta Transportation provided information on land used for the construction or widening of roads and highways. Separate figures were collected for municipal roads and provincial highways under the headings of a) construction, and b) widening. Roads within improvement districts and special areas are under provincial jurisdiction and land used for these were recorded under the "provincial" headings. Roads within urban areas were not recorded. Other highway uses such as rest stops, maintenance yards and gravel pits were also recorded.

The road plans from which data were taken gave a separate listing for the area of land not formerly included in a road plan or existing road allowance. Only this area was recorded. It is recognized, however, that some agricultural production (such as haying) does take place on road allowances and that the procedures used here may somewhat overestimate the impact of highway development on agricultural production. On the other hand there may be an underestimate of the impact of highways on agriculture, in that the reduced production on parcels fragmented by highway construction is not taken into account.

As in the category of urban annexation, the prior use of land used for highways was not known. The methodology described above with respect to prior use was employed; the results are given in the next chapter. The date recorded for conversions to highway use is the date of plan registration.

## 9. Oil and Gas Well Sites and Compressor Stations

### a) Well Sites

Data on computer tape were obtained from the Energy Resources Conservation Board. Information included on the tape included legal location, spud date<sup>1</sup>, and the type of well for all wells in the "white" and "yellow" areas in the province. The E.R.C.B. has a total of 99 well site codes which can be categorized into three groups: 1. new wells, 2. renewed wells, and 3. abandoned wells. New wells include all wells other than those designated by E.R.C.B. as abandoned or abandoned and renewed. Abandoned wells are primarily dry holes, either no oil or gas was discovered or the hole has been deemed relatively unproductive and subsequently abandoned. Reclamation of these holes usually will

---

1. Spud Date means actual date of drilling.

take place within one year. Renewed wells are wells which are classified by the E.R.C.B. as "abandoned" and reentered/recompleted/or completed as farm gas. In the first two cases the well was deemed unproductive at one time and now found to be useful. In the case of farm gas, the well is not productive enough for full scale operation, however, for the farmer involved and perhaps a few neighbors the well is useful. E.R.C.B. staff indicate that the farm gas well site is usually substantially smaller than the average well site, however, case by case information is not available.

The E.R.C.B. files do not include the leased area for any well types on a case by case basis. The 1976-80 inventory study reported that E.R.C.B. staff stated that a provincial average of 4.5 acres per well site should be used, this being comprised of 3 acres for the well site and 1.5 acres for the access road. Considerable variation exists in well site leased areas. In those cases where the well is connected to a pipeline system, the well site lease may be smaller than average. Where battery (storage) tanks and/or flare pits are constructed, the leased area will generally be larger. The spacing pattern of the well on the quarter section will also affect the leased area. Where the site is adjacent to an existing road no access road will be required. This may be more common in southern Alberta where corner locations have been used for a longer period of time to facilitate sprinkler irrigation. Gas wells may require less area than oil wells since they are more frequently connected to a pipeline system. Despite these factors, an area of 4.5 acres per well site (both new and abandoned) has been used in this study.

With respect to well site area, it should also be noted that the leased area may be larger than the area removed from agricultural production. During the drilling stage the whole lease is likely used, but once the well is in production the farmer may be allowed to resume use of some proportion of the site if topsoil has not been stockpiled. In some cases the access road may also be farmable. Details would be subject to local agreement between farmers and leaseholders. No account

of these factors has been made in this study and therefore the impact of oil and gas well development on agricultural production may be somewhat overestimated. Once again there may be offsetting negative impacts, such as disruption of farming patterns.<sup>1</sup>

The E.R.C.B. compiles information on storage batteries but this information does not include the date of construction or the amount of land used. As mentioned above, many batteries are built on well sites. It has not been possible to include those batteries not built on a well site in this study.

#### b) Compressor Stations

The data for compressor stations was collected from the E.R.C.B. Dates of construction were unavailable therefore a log of all recent compressor stations was collected (i.e. 1970-81). The amount of land used by the compressors was unavailable on a case-by-case basis, so a sample was taken and municipal assessors recorded the exact acreage. The average of this sample is 3.75 acres per case; this acreage figure was used to derive the results given in Chapter III.

---

1. See for example, Frank Hanus, "Well Site Spacing Pattern: An Agricultural Perspective", Resource Economics Branch, Alberta Agriculture, Feb. 1981.

## 10. Coal Strip Mines

The Department of Environment, Land Reclamation Division, provided information on coal strip mining and reclamation activity in the agricultural area of the province. Six major mines were reported:

- a) Whitewood Mine - Trans-Alta Utilities Ltd.  
(north side of Lake Wabamun, Parkland County)
  
- b) Highvale Mine - Trans-Alta Utilities Ltd.  
(south of Forestburg, Flagstaff County)
  
- c) Diplomat Mine - Forestburg Collieries Ltd.  
(south of Forestburg, Flagstaff County)
  
- d) Vesta Mine - Manalta Coal Ltd.  
(south of Forestburg, Paintearth County)
  
- e) Roselyn Mine - Manalta Coal Ltd.  
(near Sheerness, Special Area 2)
  
- f) Paintearth Mine - Luscar Ltd.  
(County of Paintearth)

The Land Reclamation Division estimates an additional annual acreage loss of approximately 20 acres. This additional land disturbance is not taken into account in this study.

The Land Reclamation Division provided survey maps of the major coal mines in the agricultural regions. These maps show the annual addition (reclamation) and removal (mining) for each mining company. The legal locations were obtained from these maps so that C.L.I. designations could be applied (using 1:250,000 scale C.L.I. maps). Acreages, in published form, were also provided by the Land Reclamation Division.

No C.L.I. distribution is reported for reclaimed land since productivity may be changed from what it was prior to disturbance. Alberta's Coal Development Policy states that "The primary objective in land reclamation is to ensure that the mined or disturbed land will be returned to a state which will support plant and animal life or be otherwise productive or useful to man at least to the degree it was before it was disturbed".<sup>1</sup> The Development and Reclamation Review Committee does not however, demand that this requirement be met within small land units. It looks, rather, at the total disturbance area in seeking to ensure that the land use capabilities present before disturbance will be returned proportionately by reclamation.

#### 11. Other Non-Agricultural Uses

##### a) Powerlines

Data on miles of powerlines were obtained from the Energy Resources Conservation Board, in their annual statistics publication "Alberta Electric Industry". Exact legal locations and right-of-way areas are not available at present, however, a discussion on powerline right-of-ways is given in Chapter III. Information on the large tower type lines was obtained via conversations with the major power companies. It should be remembered that powerlines create more of an inconvenience to farming rather than a direct removal of agricultural land.<sup>2</sup> Because adequate information was not available, powerline right-of-way data were not entered in the computerized data base.

---

1. Government of Alberta, "A Coal Development Policy for Alberta", Department of Energy and Natural Resources, June 15, 1976, page 7.

2. See Frank Hanus, "Assessment of the Effects of Power Lines on Farming Operations in Alberta", Resource Economics Branch, Alberta Agriculture, April, 1979.



## b) Pipelines

The treatment of pipeline information in this study is similar to that of powerlines. Details on area and legal description of pipelines were unavailable and, although pipelines involve a greater amount of actual land disturbance per linear mile than do powerlines, the land is usually reclaimed in a relatively short period of time. Pipeline data were excluded from the computerized data base but summary information is presented in Chapter III. That information is based on correspondence with E.R.C.B. staff.

## c) Railroads

Data on railroads were obtained from the Production Economics Branch, Alberta Agriculture. There was no mainline construction on agricultural lands in 1981 according to the publication "Agriculture Transportation"<sup>1</sup>. Railroad abandonment is discussed in Chapter III. Although little information is available on the land use of the abandoned rail line right-of-way, it is likely that a portion of it will be converted to agricultural use.

## d) Airports

The Aviation Branch of Alberta Transportation provided information on new airports in the province. Smaller airports located on farms are not required to report abandonments, therefore, the Aviation Branch is not able to keep accurate records on land being removed from airport usage.

---

1. "Agriculture Transportation", Production Economics Branch, Alberta Agriculture.

e) Sand and Gravel Pits

The Land Reclamation Division of Alberta Environment has done a survey on sand and gravel pits in the province. The quarter section descriptions were recorded along with the acreage disturbed by the pit. The C.L.I. classification was applied to most cases by the LANDUP<sup>1</sup> program. The C.L.I. classification may somewhat overestimate the productivity of land being disturbed by sand and gravel pits.

12. Data Analysis

The Statistical Package for the Social Sciences (SPSS) was used to perform frequency distributions and cross-tabulations. The study identifies land use conversion categories and displays them against geographical areas while relating them to land productivity classes.

---

1. Explained earlier in this chapter.

CHAPTER III  
ANALYTICAL RESULTS

This chapter presents the results of the 1981 update, in most cases there will be a table summarizing the results from 1976 onward. For a more detailed analysis of the years 1976-1980 it is suggested that the publication entitled "An Inventory Of Changes In Alberta's Agricultural Land Base between 1976 and 1980" be obtained.<sup>1</sup>

1. Overview of Agricultural Land Base Changes

Table 1 is a summary of the data collected for 1981 which is coded in the computerized data base. These figures are general in that they have no geographical or productive representation; they show that the total additions to the agriculture land base outweigh the losses by 30,657 acres.

The majority of the gains in new agricultural land are from public land dispositions. Most of the losses in agricultural land are through non-agricultural subdivisions, oil and gas wells and public land reservations. The other loss categories accounted for smaller amounts of land. The public land reservation category, as mentioned in Chapter II, includes those lands which are either temporarily or permanently removed from the agricultural disposition.

Table 1 includes only those land conversion categories which were included in this study's computerized data base. As mentioned in Chapter II, the impact on the agricultural land base from such non-agricultural uses as pipelines and compressor stations may be of some significance,

---

1. Copies available through the Resource Economics Branch, Alberta Agriculture.

Table 1 Summary of Agricultural Land Base  
Changes in Alberta, 1981

	(Acres)	(%)
A. Additions of Agricultural Land		
1. Public land dispositions	108,052	95.5
a. Leading to title	5,006	4.4
b. Not leading to title	65,960	58.3
c. Grazing Reserve	37,085	32.8
2. Abandoned oil & gas wells	4,617	4.1
3. Reclaimed strip mines	530	.4
Total additions (hectares)	113,199 (45,811)	100.0
B. Removals of Agricultural Land		
1. Non-agricultural subdivisions	27,704	33.6
2. Urban annexations	8,563	10.4
3. Roads	4,991	6.1
4. Oil & gas wells	19,112	23.2
5. Coal strip mines	689	.6
6. Public land reservation	21,483	26.1
Total removals (hectares)	82,542 (33,404)	100.0
Additions less removals (hectares)	+ 30,657 (12,407)	

but lack of adequate data on these conversion categories prevented their full treatment in this study.

It should also be mentioned that for four of the land removal categories (annexation, roads, wells, and strip mines) the prior use of the land was not known on a case-by-case basis. As discussed in Chapter II, the procedure used to determine prior use involved the examination of aerial photographs and municipal assessment records in order to determine a province-wide ratio of agricultural land (white and yellow areas) converted to each of these non-agricultural categories.

The results of that procedure are as follows:

Non-Agricultural Category	Agricultural land as % of total land converted to each category
Urban Annexation	89
Roads	88
Oil & gas wells	94
Coal strip mines	80**

\*\* Estimated from information provided by staff of the Land Reclamation Division, Alberta Environment.

The figures in Table 1 do not take this prior use factor into consideration. Making the adjustment in the appropriate use categories gives the results shown in Table 2.

Table 2 Removal of Agricultural Land, Adjusted for Prior Use, 1981

	('000 acres)	(%)
1. Non-agricultural Subdivision	27.7	34.7
2. Urban Annexations	7.7	9.6
3. Roads	4.4	5.5
4. Oil and Gas Wells	18.0	22.5
5. Coal Strip Mines	.6	.8
6. Public Land Reservations	21.5	26.9
Total Removal ('000 acres)	79.9	100
('000 hectares)	32.3	

The differences between the figures in Table 2 and those shown in Table 1 result in only a 3.3 percent reduction in total land removal, when the adjustment for prior use is made. Since this information is not available on a case-by-case basis, it is not possible to determine the adjustment which would have to be made on a more disaggregated conversion figure. Therefore, the prior use adjustment will not be made in the tables and discussions throughout this report.

Table 3 shows the annual changes in the major land conversion categories over the period 1976-1981. Total additions have continued to climb; the figure of 108.1 thousand acres is almost double that of 1976. Total land removal still remains high relative to 1976, however the trend has leveled off and remains below the peak of 95.8 thousand acres (1979). Overall agricultural land conversion seems to have remained fairly stable relative to 1980 and 81 with the exception of public land dispositions which have continued to rise. Perhaps the slowdown of the "economic boom" has been indicated to some degree through the results of Table 3.

The distribution of land conversion among C.L.I. classes is important since it is closely related to changes in agricultural productivity in the province. Table 4 shows the relationship between each of the land conversion categories and the C.L.I. classes. In 1981 there has been a net gain of 3.6 thousand acres in the higher capability Classes of 1-3. The additions in C.L.I. classes 1 and 2 were both outweighed by removals of agricultural land in those soil categories. Class 3 land showed the largest net gain of agricultural land (13,969 acres).

Table 5 shows the proportion of land conversions in the arable land classifications for each of the use categories. In the higher classes of 1 and 2 there is a marked difference between additions and removals of agricultural land. Additions of agricultural land in C.L.I. classes 1 and 2 were only 3.1 percent of total additions, removals of these classes of agricultural land were 16.8 percent of total removals. This "gap" narrows when C.L.I. 1-3 is totalled, such additions were 27.2% of total

Table 3 Annual Agricultural Land Base

Changes in Alberta 1976 - 1981

	<u>Year</u>					
	1976	1977	1978	1979	1980	1981
A. Additions to Agricultural Land	('000 Acres)					
1. Public land dispositions	56.8	58.0	92.1	68.0	96.3	108.1
2. Abandoned oil & gas wells	0.4	0.2	3.3	4.5	5.1	4.6
3. Reclaimed coal strip mines	0.2	0.3	0.5	0.6	0.4	0.5
Total additions	57.4	58.5	95.9	73.1	101.8	113.2
B. Removals of Agricultural Land						
1. Subdivisions**	16.6	36.4	37.8	29.4	19.6	27.7
2. Urban annexations	7.0	8.4	17.8	34.7	23.0	8.6
3. Roads	5.4	5.1	5.2	3.5	5.9	5.0
4. Oil & gas wells	21.3	21.1	19.4	18.4	22.9	19.1
5. Coal strip mines	0.3	0.3	0.4	0.4	0.5	0.7
6. Public land reservations	3.5	3.7	2.2	9.4	11.1	21.5
Total removals	54.1	75.0	82.8	95.8	83.0	82.6
Additions less removals	3.3	-16.5	13.1	-22.7	18.8	30.6

\*\* See discussion on non-agricultural subdivisions in Chapter III.

Table 4 Land Changes by C.L.I. Class, Alberta 1981

	C.L.I. Class**										Total													
	1	2	3	4	5	6	7	Organic	Undeter- mined															
A. Addition to Agricultural Land***																								
1. Public land disposition (acres)	32	2310	25988	44712	14367	3218	2381	14435	609	108,052														
(%)	0	2.1	24.1	41.4	13.3	3.0	2.2	13.4	.6	100														
2. Abandoned oil & gas wells	180	954	1238	1044	761	225	27	144	46	4,617														
(%)	3.9	20.7	26.8	22.6	16.5	4.9	.6	3.1	1.0	100														
Total additions	212	3264	27226	45756	15128	3443	2408	14579	655	112669														
(%)	.2	2.9	24.2	40.6	13.4	3.1	2.1	12.9	.6	100														
B. Removal of Agricultural Land																								
1. Subdivisions (acres)	961	4781	5973	7492	6059	1838	200	396	5	27,704														
(%)	3.5	17.3	21.6	27.0	21.9	6.6	0.7	1.4	0	100														
2. Urban annexations	635	2151	1903	1966	531	320	0	257	800	8,563														
(%)	7.4	25.1	22.2	23.0	6.2	3.7	0	3.0	9.3	100														
3. Roads & highways	316	911	1184	1136	822	372	115	135	0	4,991														
(%)	6.3	18.3	23.7	22.8	16.5	7.5	2.3	2.7	0	100														
4. New oil & gas wells	707	2957	3492	4887	3870	1098	140	306	1656	19,113														
(%)	3.7	15.5	18.3	25.6	20.2	5.7	.7	1.6	8.7	100														
5. Public land reservations	0	420	365	3884	1577	476	2768	11,993	0	21,483														
(%)	0	2.0	1.7	18.1	7.3	2.2	12.9	55.8	0	100														
6. Coal strip mines	0	0	340	151	163	35	0	0	0	689														
(%)	0	0	49.3	21.9	23.7	5.1	0	0	0	100														
Total Removals	2619	11220	13257	19516	13022	4139	3223	13087	2461	82543														
(%)	3.2	13.6	16.1	23.6	15.8	5.0	3.9	15.8	3.0	100														
Additions less removals	-2407	-7956	13969	26240	2106	-696	-815	1492	-1806	30120														

\*\* C.L.I. values are estimated in most cases.  
 \*\*\* Not including reclaimed coal strip mines.

True capability may be somewhat lower for subdivisions. See discussion in Chapter 11.



Table 5 Arable Land as a Proportion of Land Conversion, Alberta 1981

Conversion Category	C.L.I. Classification**					Total
	1-2	1-3	1-4	Non-Arable (5-7) & Undetermined		
<b>A. Additions of Agricultural Land</b>						
1. Public land disposition	(%) 2.2	26.2	67.6	32.4	100	
2. Abandoned oil & gas wells	(%) 24.6	51.4	74.0	26.0	100	
Total additions	Acres ('000) 3.5	30.7	76.5	36.2	112.7	
	(%) 3.1	27.2	67.9	32.1	100	
<b>B. Removals of Agricultural Land</b>						
1. Non-agricultural subdivision	(%) 20.8	42.3	69.3	30.7	100	
2. Urban annexations	(%) 32.5	54.8	77.7	22.3	100	
3. Roads & highways	(%) 24.6	48.3	71.1	28.9	100	
4. New oil & gas wells	(%) 19.2	37.4	63.0	37.0	100	
5. Public land reservations	(%) 2.0	3.7	21.7	78.3	100	
6. Coal strip mines	(%) 0	49.3	71.3	28.7	100	
Total removals	Acres ('000) 13.8	27.1	46.6	35.9	82.5	
	(%) 16.8	32.8	56.5	43.5	100	
Net change	Acres ('000) -10.4	+3.6	+29.8	+3	30.1	
	(%) 34.4	12.0	99.1	0.9	100	

\*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.

additions while removal of agricultural land in Classes 1-3 were 32.8% of total removals. When additions and removals of all arable land (Classes 1-4) are compared by categories, the additions category had a larger proportion of land allocated in the arable range (67.9%), removals of agricultural land in Classes 1-4 were 56.5 percent of total removals.

Tables 4 and 5 show some significant differences among use categories in the C.L.I. ratings of land being added to and removed from the province's agricultural land base. Urban annexations account for the highest proportion of land removals in the arable category (C.L.I. classes 1-4), followed by coal strip mines, roads and highways and subdivisions. Public land reservations showed the highest proportion of land removals in the non-arable category, significantly different from public land dispositions. The relative amounts of land in these conversion categories must be appreciated in interpreting these results (see Table 1). The method of assigning C.L.I. values to converted parcels must also be kept in mind: the assigned value is the predominant class in the quarter section in which the conversion occurred.

The geographical pattern of land conversions is summarized in Table 6, details are presented in Tables 7 to 10.

Table 6 Percentage Distribution of Land Conversion By Region, 1981

	<u>Region</u>				
	<u>Southern</u>	<u>Central</u>	<u>Northern</u>	<u>Peace</u>	<u>Total</u>
Total Additions %	0.7	0.8	17.9	80.6	100
Total Removals %	6.9	28.3	42.4	22.4	100

There is a striking regional difference between additions and removals of agricultural land; 78% of the removals occurred in the Southern, Central and Northern regions, while 80% of the additions occurred in the Peace region. Tables 7 to 10 show the conversion category and C.L.I. classification within each region.<sup>1</sup>

1. Tables 6 through 10 do not include new or abandoned wells, since this information is not available on a regional basis, thus the net conversion figures may be biased.

Table 7 Land Base Changes in the Southern Region by C.L.I. Class, 1981

Conversion Category	C.L.I. Class:							Total	
	1	2	3	4	5	6	7		
A. Additions of Agricultural Land									
1. Public land disposition (acres)	0	0	0	170	318	261	0	0	749
(%)	0	0	0	22.7	42.5	34.8	0	0	100
Total additions	0	0	0	170	318	261	0	0	749
(%)	0	0	0	22.7	42.5	34.8	0	0	100
B. Removals of Agricultural Land									
1. Subdivisions (acres)	86	528	206	458	457	232	0	0	1967
(%)	4.4	26.8	10.5	23.3	23.2	11.8	0	0	100
2. Urban annexations	143	570	88	4	80	0	0	0	885
(%)	16.2	64.4	9.9	.5	9.0	0	0	0	100
3. Roads	12	342	156	175	308	153	57	0	1203
(%)	1.0	28.4	13.0	14.5	25.6	12.7	4.7	0	100
4. Public land reservations	0	0	0	0	303	0	0	0	303
(%)	0	0	0	0	100	0	0	0	100
Total removals	241	1440	450	637	1148	385	57	0	4358
(%)	5.5	33.1	10.3	14.6	26.3	8.8	1.3	0	100
Additions less removals	-241	-1440	-450	-467	-830	-124	-57	0	-3609

∴ Oil and gas wells not available on a regional basis.

∴∴∴ C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter 11.

Table 8 Land Base Changes in the Central Region by C.L.I. Class, 1981

Conversion Category	C.L.I. Class							Total		
	1	2	3	4	5	6	7			
A. Additions of Agricultural Land										
1. Public land dispositions (acres)	0	0	0	110	0	203	0	330	0	643
(%)	0	0	0	17.1	0	31.6	0	51.3	0	100
2. Reclaimed strip mines	0	0	0	0	0	0	0	0	0	264
Total additions	0	0	0	110	0	203	0	330	0	907
(%)	0	0	0	12.1	0	22.4	0	36.4	0	100
B. Removals of Agricultural Land										
1. Subdivision (acres)	296	1889	1459	1548	2800	1081	54	101	5	9232
(%)	3.2	20.5	15.8	16.8	30.3	11.7	.6	1.1	0	100
2. Urban annexation	77	738	1193	1225	451	0	0	257	800	4741
(%)	1.6	15.6	25.2	25.8	7.5	0	0	5.4	16.9	100
3. Roads	108	133	330	433	325	138	8	23	0	1498
(%)	7.2	8.9	22.0	28.9	21.7	9.2	.5	1.5	0	100
4. Public land reservations	0	0	0	320	320	0	0	1439	0	2079
(%)	0	0	0	15.4	15.4	0	0	69.2	0	100
5. Coal strip mines	0	0	305	5	126	0	0	0	0	436
(%)	0	0	70.0	1.1	28.9	0	0	0	0	100
Total removals	481	2760	3287	3531	4022	1219	62	1820	805	17986
(%)	2.7	15.3	18.3	19.6	22.4	6.8	.3	10.1	4.5	100
Additions less removals	-481	-2760	-3287	-3421	-4022	-1016	-62	-1490	-805	-14079

:: Oil and gas wells not available on a regional basis.  
 :::: C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.  
 ::::: Reclaimed strip mines not available on a C.L.I. breakdown, however, the total for the region is included.

Table 9 Land Base Changes in the Northern Region by C.L.I. Class, 1981

Conversion Category	C.L.I. Class <sup>***</sup>							Undeter- mined	Total	
	1	2	3	4	5	6	7			
A. Additions to Agricultural Land										
1. Public land dispositions (acres)	32	59	29	5039	7745	224	0	6016	0	19144
(%)	.2	.3	.2	26.3	40.5	1.2	0	31.4	0	100
2. Reclaimed coal strip mines <sup>****</sup>										266
Total additions	32	59	29	5039	7745	224	0	6016	0	19410
(%)	.2	.3	.1	26.0	39.9	1.2	0	31.0	0	100
B. Removals of Agricultural Land										
1. Subdivisions (acres)	573	1204	3403	4747	2541	490	0	285	0	13243
(%)	4.3	9.1	25.7	35.8	19.2	3.7	0	2.2	0	100
2. Urban annexations	415	601	559	737	0	320	0	0	0	2632
(%)	15.8	22.8	21.2	28.0	0	12.2	0	0	0	100
3. Roads	196	340	427	484	187	45	2	86	0	1767
(%)	11.1	19.2	24.2	27.4	10.6	2.5	.1	4.9	0	100
4. Public land reservations	0	0	0	1942	797	320	0	5921	0	8980
(%)	0	0	0	21.6	8.9	3.6	0	65.9	0	100
5. Coal strip mines	0	0	35	146	37	35	0	0	0	253
(%)	0	0	13.8	57.8	14.6	13.8	0	0	0	100
Total	1184	2145	4424	8056	3562	1210	2	6292	0	26875
(%)	4.4	8.0	16.5	30.0	13.3	4.5	0	23.4	0	100
Additions less removals	-1152	-2086	-4395	-3017	4183	-986	-2	-276	0	-7465

∴ Oil and gas wells not available on a regional basis.

\*\*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter 11.

\*\*\*\* Reclaimed strip mines not available on a C.L.I. breakdown, however, the total for the region is included.

Table 10 Land Base Changes in the Peace Region by C.L.I. Class, 1981

Conversion Category	C.L.I. Class:::							Undeter- mined	Total
	1	2	3	4	5	6	7		
A. Additions to Agricultural Land									
1. Public land disposition (Acres)	0	2251	25959	39393	6304	2530	2381	8089	87516
(%)	0	2.6	29.7	45.0	7.2	2.9	2.7	9.2	100
Total additions	0	2251	25959	39393	6304	2530	2381	8089	87516
(%)	0	2.6	29.7	45.0	7.2	2.9	2.7	9.2	100
B. Removals of Agricultural Land									
1. Subdivision (Acres)	6	1160	899	735	261	35	146	10	3252
(%)	.2	35.7	27.6	22.6	8.0	1.1	4.5	.3	100
2. Urban annexations	0	242	63	0	0	0	0	0	305
(%)	0	79.3	20.7	0	0	0	0	0	100
3. Roads & Highways	0	96	271	44	2	36	48	26	523
(%)	0	18.4	51.8	8.4	.4	6.9	9.2	5.0	100
4. Public land reservations	0	420	365	1622	157	156	2768	4633	10121
(%)	0	4.1	3.6	16.0	1.6	1.5	27.3	45.8	100
Total	6	1918	1598	2401	420	227	2962	4669	14201
(%)	0	13.5	11.2	16.9	3.0	1.6	20.9	32.9	100
Additions less removals	-6	333	24361	36992	5884	2303	-581	3420	73315

:: Oil and gas wells not available on a regional basis.

::: C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.

The percentages given in Tables 7-10 are row percentages, they show the proportion of land lost in each C.L.I. class for each use category. For example, in the Southern region subdivisions make up 26.8 percent of total subdivision acreage allocated on C.L.I. class 2 land. In the same region, annexations make up 64.4 percent of total annexed land on C.L.I. class 2 land. With the row percentages, use categories can be compared as to the relative proportion of land in each of the C.L.I. classes.

Changes in the agricultural land base in this report are made up of both temporary and permanent removals of agricultural land. Chapter II briefly discussed the use categories used in this study, removals of agricultural land are grouped under two headings: temporary and permanent. Non-agricultural subdivisions, urban annexations, and roads can generally be considered permanent removals of agricultural land. Wells, strip mines, and public land reservations, can generally be considered temporary removals. Table 11 shows the regional and C.L.I. breakdown of acres under the permanent and temporary removal headings. Exactly half of total removals were under the permanent heading and half under the temporary heading. However, 69% of total removals of agricultural land in C.L.I. classes 1 to 3 are permanent removals. Other totals and percentages are given in Table 11.

## 2. Public Land Dispositions and Reservations

Public land dispositions for agricultural uses are grouped into three main headings: a) dispositions leading to title (sales), b) dispositions not leading to title (leases and permits), and c) grazing reserves. Table 12 lists the annual breakdown of these categories. There are no clear trends evident in this table although in 1981 there

Table 11 Permanent and Temporary Removals of Agricultural Land by Region and C.L.I. Class, 1981

Region	1	2	3	4	5	6	7	Organic	Undeter- mined	Total
A. Permanent Removals:::										
1. Southern	241	1440	450	637	845	385	57	0	0	4055
2. Central	481	2760	2982	3206	3576	1219	62	381	804	15471
3. Northern	1184	2145	4389	5968	2728	855	2	371	0	17642
4. Peace	6	1498	1233	779	263	71	194	36	0	4080
Total permanent removals	1912	7843	9054	10590	7412	2530	315	788	804	41248
Permanent as % of total removals	73.0	69.9	68.3	54.3	56.9	61.1	9.8	6.0	32.7	50.0
B. Temporary Removals:::										
1. Southern	0	0	0	0	303	0	0	0	0	303
2. Central	0	0	305	325	446	0	0	1439	0	2515
3. Northern	0	0	35	2088	834	355	0	5921	0	9233
4. Peace	0	420	365	1622	157	156	2768	4633	0	10121
C. Well Sites by C.L.I. only	707	2957	3492	4887	3870	1098	140	306	1656	19113
Total temporary removals	707	3377	4197	8922	5610	1609	2908	12,299	1656	41285
Temporary as % of total removals	27.0	30.1	31.7	45.7	43.1	38.9	90.2	44.0	67.3	50.0

:: See discussion on C.L.I. classification in Chapter II.  
 ::: Includes Non-agricultural subdivision, annexations, roads.  
 :::: Coal mines, public land reservations, well sites ("C" not available on a regional breakdown).



Table 12 Annual Public Land Dispositions, Alberta 1976 - 1981

Disposition Category	Year						Total
	1976	1977	1978	1979	1980	1981	
	('000 Acres)						
1. Disposition leading to title*	17.1	37.0	26.7	24.9	17.6	5.0	128.3
2. Disposition not leading to title	14.2	21.0	21.1	21.6	31.4	66.0	175.3
3. Grazing reserves	25.5	0	44.3	21.5	47.3	37.1	175.1
Total dispositions	56.8	58.0	92.1	68.0	96.3	108.1	479.3

\*: Farm development lease is included under disposition not leading to title while it is recognized that many of these cases may eventually lead to change in titles (not distinguishable).

Table 13 Public Land Dispositions: Region, Type of Disposition and C.L.I. Class: 1981

Conversion Category	C.L.I. Class							Organic	Undeter- mined	Total
	1	2	3	4	5	6	7			
A. Southern										
1. Not leading to title: (%)	0	0	0	170	318	261	0	0	0	749
	0	0	0	22.7	42.5	34.8	0	0	0	100
B. Central										
1. Not leading to title: (%)	0	0	0	110	0	203	0	330	0	643
	0	0	0	17.1	0	31.6	0	51.3	0	100
C. Northern										
1. Leading to title (%)	0	0	0	637	80	80	0	160	0	957
	0	0	0	66.5	8.4	8.4	0	16.7	0	100
2. Not leading to title: (%)	32	59	29	4402	7665	144	0	5215	0	17546
	.2	.3	.2	25.1	43.7	.8	0	29.7	0	100
3. Grazing reserve (%)	0	0	0	0	0	0	0	641	0	641
	0	0	0	0	0	0	0	100	0	100
D. Peace										
1. Leading to title (%)	0	400	959	2670	0	0	0	0	0	4049
	0	9.9	23.7	66.4	0	0	0	0	0	100
2. Not leading to title: (%)	0	1851	12916	20613	3918	2530	1586	3478	130	47022
	0	3.9	27.5	43.8	8.3	5.4	3.4	7.4	.3	100
3. Grazing reserve (%)	0	0	12084	16090	2386	0	795	4611	478	36444
	0	0	33.2	44.1	6.5	0	2.2	12.7	1.3	100

:: C.L.I. values are estimated in most cases. See discussion in Chapter II  
 ::: Farm development leases in some cases lead to change in title.

was a drastic change in the proportion of dispositions in the "title" or "no-title" categories. Dispositions leading to title dropped from 17,600 acres in 1980 to 5,000 acres in 1981 while dispositions not leading to title increased from 31,400 to 66,000 acres in the same period. Farm development leases are under the "not leading to title" category, however, many of these leases have an option to buy clause which comes into effect at the end of the lease. Possibly many of these farm development leases will lead to title in the future which would offset the large drop from 17,600 to 5,000 acres in 1981. The number of acres which are under disposition would not change, though their category "label" would change from lease to sale.

Table 13 shows a regional breakdown of public land dispositions into the C.L.I. classes. Both the Southern and Central region showed minimal acreage allotted to dispositions for agriculture. The Peace region obtained the majority of public land dispositions. Approximately 68% of all dispositions for agriculture were on lands in arable Class 1-4. About 76% of land for grazing reserves were directed onto C.L.I. classes 3 and 4.

Public land reservations are applied by the Public Lands Division of Alberta Energy and Natural Resources for the purposes of land management. Most of the land (approximately 79%) is of a lower average productivity (Class 5,6,7, and Organic). Therefore, much of the land reported as "lost" is of poor agricultural capability.

### 3. Non-Agricultural Subdivision

Table 15 shows the subdivided acreage by the intended use and year. Intended use is obtained from the subdivision application forms and the commission staff. Placing subdivision uses into categories varies somewhat between the various commissions and added to this the intended use may differ from the actual use after approval is given. The data for 1981 was collected on the basis of approval or conditional

Table 14 Public Land Reservations: Region and C.L.I. Class, 1981

Region	C.L.I. Class							Undeter- mined	Total		
	1	2	3	4	5	6	7			Organic	
1. Southern (acres) (%)	0	0	0	0	303	0	0	0	0	0	303
	0	0	0	0	100	0	0	0	0	0	100
2. Central (acres) (%)	0	0	0	320	320	0	0	1439	0	2079	
	0	0	0	15.4	15.4	0	0	69.2	0	100	
3. Northern (acres) (%)	0	0	0	1942	797	320	0	5921	0	8980	
	0	0	0	21.6	8.9	3.6	0	65.9	0	100	
4. Peace (acres) (%)	0	420	365	1622	157	156	2768	4633	0	10121	
	0	4.1	3.6	16.0	1.6	1.5	27.3	45.8	0	100	

Table 15 Non-Agricultural Subdivision: Intended use and Year

Intended use Category	Year							Total
	1976	1977**	1978**	1979**	1980	1981***		
1. Country residence (acres) (%)	2043 12.3	4690 12.9	4894 12.8	6813 23.1	3081 15.6	8894 32.1	30414 18.1	
2. Multi- parcel c.r. (acres) (%)	5865 35.3	22633 62.0	24280 63.7	14947 50.7	6526 33.0	7359 26.6	81610 48.5	
3. Farmstead separation (acres) (%)	5512 33.1	3594 9.9	3522 9.2	3964 13.4	6571 33.3	6880 24.8	30043 17.9	
4. Commercial/ industrial (acres) (%)	350 2.1	3314 9.1	3197 8.4	2597 8.8	2084 10.5	2166 7.8	13709 8.2	
5. Public/ institutional (acres) (%)	394 2.4	830 2.3	974 2.6	396 1.3	449 2.3	767 2.8	3810 2.3	
6. Hamlet Expansion (acres) (%)	201 1.2	88 0.2	137 0.4	165 0.6	465 2.4	33 .1	1089 .6	
7. Waste Disposal (acres) (%)	526 3.2	232 0.6	346 0.9	221 0.9	378 1.9	1001 3.6	2754 1.6	
8. Private Recreation (acres) (%)	1738 10.4	758 2.1	209 0.5	166 0.6	201 1.0	604 1.2	3675 2.2	
9. Other (acres) (%)	2 0	339 0.9	557 1.5	163 0.6	0 0	0 0	1061 0.6	
Total Acres (%)	16631 100	36478 100	38116 100	29482 100	19755 100	27704 100	168165 100	

\*\* These years were collected from the ECA computer tapes.

\*\*\* 1981 figures based on approvals, see discussion in Chapter II.

approval. The data for 1977-1979 in the 1982 study was collected on the same premise with respect to approvals. The years 1976 and 1980 were collected on the basis of endorsement, or registration with land titles where possible. This leaves the six years in total somewhat inconsistent, however, general trends in subdivision activity are still evident. One can keep in mind that approximately 60 - 80% of subdivision approvals eventually reach registration at land titles.

Fluctuation is evident throughout the years 1976-1981. The actual total acreage for 1981 would be reduced somewhat when the number of cases actually endorsed is taken into consideration. This seems in line, since much of the subdivision activity began to slow in the latter half of 1981. The proportion of acreage in the various use categories remained quite similar to previous years. It can be seen in Table 15 that single country residences, multi-parcel country residences and farmsteads separations consume the bulk of non-agricultural subdivisions. For 1982 the figure has likely dropped due to the decrease in economic activity, this will undoubtedly continue on through 1983.

Proportions of arable land by use categories are summarized in Table 16. Table 17 shows the detailed breakdown of the use categories by the C.L.I. classification. All use categories except multi-parcel country residences and private recreation had a higher proportion of land in the arable category (Class 1-4). Surprisingly, multi-parcel C.R.'s had a higher proportion of subdivisions located on non-arable land. This is a reversal from previous years and a much needed change. Single country residences, farmstead separations, commercial/industrial, and waste disposal use categories all used a higher proportion of agriculturally productive land than did the multi-parcel country residences. This must be viewed in light of the problems with C.L.I. determination. Ratings reported in Tables 16 and 17 may overestimate the agricultural productivity of the land used for subdivision purposes.

Table 16 Arable Land As Proportion of Non-Agricultural Subdivision,  
Alberta 1981

	C.L.I. Class	1-2	1-3	1-4	Non-Arable & Undetermined	Total
1. Single country residence	(acres) (%)	1938 21.8	3834 43.1	7143 80.3	1751 19.7	8894 100
2. Multi-parcel country residence	(acres) (%)	688 9.3	1384 18.8	2783 37.8	4576 62.2	7359 100
3. Farmstead separation	(acres) (%)	1685 24.5	4203 61.1	5795 84.2	1085 15.8	6880 100
4. Commercial/industrial	(acres) (%)	747 34.5	992 45.8	1685 77.8	481 22.2	2166 100
5. Public/institutional	(acres) (%)	340 44.3	389 50.7	652 85.0	115 15.0	767 100
6. Hamlet expansion	(acres) (%)	24 72.7	25 75.8	33 100	0 0	33 100
7. Waste disposal	(acres) (%)	318 31.8	842 84.1	946 94.5	55 5.5	1001 100
8. Private recreation	(acres) (%)	2 .3	46 7.6	170 28.1	434 71.9	604 100
Total Subdivision	(%)	5,742 20.7	11,715 42.3	19,207 69.3	8,487 30.6	27,704 100

Table 17 Non-Agricultural Subdivision: Intended Use by C.L.I., 1981\*\*

Intended use category	1	2	3	4	C.L.I. Class			7	Organic	Undeter- mined	Total
					5	6	6				
1. Country residence single (acres) (%)	232 (%)	1706 19.2	1896 21.3	3309 37.2	1000 11.2	345 3.9	84 .9	318 3.6	4 0	8894 100	
2. Multi-parcel country residence (acres) (%)	88 (%)	600 8.2	696 9.5	1399 19.0	3300 44.8	1198 16.3	60 .8	18 .2	0 0	7359 100	
3. Farmstead separation (acres) (%)	175 (%)	1510 21.9	2518 36.6	1592 23.1	746 10.8	272 4.0	47 .7	20 .3	0 0	6880 100	
4. Commercial/Industrial (acres) (%)	261 (%)	486 22.4	245 11.3	693 32.0	439 20.3	23 1.1	19 .9	0 0	0 0	2166 100	
5. Public/Institutional (acres) (%)	202 (%)	138 18.0	49 6.4	263 34.1	115 15.0	0 0	0 0	0 0	0 0	767 100	
6. Hamlet expansion (acres) (%)	3 (%)	21 63.6	1 3.0	8 24.2	0 0	0 0	0 0	0 0	0 0	33 100	
7. Waste disposal (acres) (%)	0 (%)	318 31.8	524 52.3	104 10.4	15 1.5	0 0	0 0	40 4.0	0 0	1001 100	
8. Private Recreation (acres) (%)	0 (%)	2 .3	44 7.3	124 20.5	434 71.9	0 0	0 0	0 0	0 0	604 100	
Total Acres	961 (%)	4781 17.3	5973 21.6	7492 27.0	6059 21.9	1838 6.6	200 .7	396 1.4	4 0	27704 100	

\*\* C.L.I. values may be somewhat lower for non-agricultural subdivisions. See discussion in Chapter 11.



The following is the section of the Planning Act 1977, pertaining to use of productive agricultural lands:

21 (1) In a rural municipality, a subdivision approving authority shall not approve an application for subdivision approval for county residential use unless the land that is the subject of the application has, in the opinion of the subdivision approving authority, a low capability for agricultural use.

(2) Subsection (1) does not apply if the land that is the subject of the application:

(a) is the site of a farmstead that is to be separated from an unsubdivided quarter section, or

(b) is the first parcel to be separated from a quarter section and the nearest boundary of the parcel is at least 1000 feet from the right of way of a highway,

and the regional plan affecting the land permits either or both of the subdivisions referred to in this subsection.

The average size of subdivided parcels is given in Table 18. In 1981 the Northern region showed a marked increase in the average size of subdivided parcels. This is partially explained by the fact that most of the 1981 data on subdivisions was collected on the basis of approvals. In some cases the acreage which is actually registered may be smaller than the amount which is approved.

The main activity of non-agricultural subdivisions occurs in the Edmonton - Calgary corridor. This area can be defined as consisting of Counties 3, 10, 14, 19, 20, 23, 25, 28, and 31 and M.D.'s 31, 44, and 90. Table 19 shows the annual breakdown of subdivision activity of this area, while Table 20 shows the categories and their proportional use of agricultural land broken down into the C.L.I. classes.

Comparing Tables 19 and 15 shows that almost one third of the subdivision activity for 1981 took place in the Edmonton - Calgary corridor. The country residence development in both the Edmonton - Calgary corridor and the full province accounted for approximately 60% of the total subdivided acreage. Table 20, (Table 17 for total provincial figures), shows the subdivision categories with acres broken down into the C.L.I. classes. It can be seen, from both of these tables, that multi-parcel country residences use less productive land than do

Table 18. Average Size of Subdivided Parcels,  
by Region and Intended Use, 1981

Intended Use Category	Region				Total
	Southern	Central	Northern	Peace	
	(acres)				
1. Single parcel country residence	7.8	6.7	14.9	10.1	10.7
2. Multi-parcel country residence	5.5	10.3	7.9	7.1	8.9
3. Farmstead separation	13.5	10.3	16.6	9.1	12.8
4. Commercial/industrial	7.5	12.7	31.1	30.0**	18.6
5. Public/institutional	12.1	29.9	29.8	4.3	20.7
6. Hamlet expansion	0	2.2**	5.5**	0.9**	2.9
7. Waste disposal	35.6	11.8	48.9	8.1**	29.7
8. Private recreation	0	28.9	3.0**	4.0**	17.6

\*\* These numbers represent an average based on fewer than 5 cases.

Table 19 Non-Agricultural Subdivision: Intended Use and Year,  
Edmonton-Calgary Corridor.:

Intended Use	Year	Year									Total
		1976	1977	1978	1979	1980	1981	1982	1983	1984	
1. Single parcel country residence	(acres) (%)	430 7.0	2679 11.2	2682 10.4	2906 17.5	516 5.7	2022 23.6	11235 12.5			
2. Multi-parcel country residence	(acres) (%)	2803 45.7	17277 72.5	19497 75.5	10577 63.8	3992 44.7	3101 36.1	57247 63.6			
3. Farmstead separation	(acres) (%)	2440 39.8	929 3.9	559 2.2	749 4.5	2568 28.7	1841 21.5	9086 10.1			
4. Commercial/industrial	(acres) (%)	120 2.0	2218 9.3	2042 7.9	2011 12.1	1060 11.9	1078 12.6	8530 9.5			
5. Public/institutional	(acres) (%)	205 3.3	378 1.6	550 2.1	242 1.5	278 3.1	354 4.1	2007 2.2			
6. Hamlet expansion	(acres) (%)	30 0.5	0 0	5 0	0 0	402 4.5	8 0	445 0.5			
7. Waste disposal	(acres) (%)	108 1.8	118 0.5	13 0	0 0	27 0.3	75 0.9	341 0.4			
8. Private recreation	(acres) (%)	0 0	0 0	0 0	0 0	93 1.0	103 1.2	196 0.2			
9. Other	(acres) (%)	1 0	239 1.0	484 1.9	83 0.5	0 0	0 0	807 0.9			
Total (acres)	(%)	6137 100	23838 100	25832 100	16568 100	8936 100	8582 100	89964 100			

:: See definition of Edmonton-Calgary corridor in text above.

Table 20 Non-Agricultural Subdivisions: Intended Use and C.L.I. Class, Edmonton-Calgary Corridor, 1981\*

Intended Use Category	C.L.I. Class							Undeter- mined	Total
	1	2	3	4	5	6	7		
1. Single parcel country residence	138 (6.8)	268 (13.3)	343 (17.0)	809 (40.0)	363 (18.0)	52 (2.6)	0	4 (.2)	2022 100
2. Multi-parcel country residence	23 (0.7)	376 (12.1)	371 (12.0)	702 (22.6)	793 (25.6)	825 (26.6)	0	0 (0.2)	3101 100
3. Farmstead separation	85 (4.6)	333 (18.1)	688 (37.4)	237 (12.9)	384 (20.9)	92 (5.0)	0	0 (1.2)	1841 100
4. Commercial/industrial	169 (15.7)	325 (30.1)	49 (4.5)	169 (15.7)	343 (31.8)	23 (2.1)	0	0 (0)	1078 100
5. Public/institutional	202 (57.1)	110 (31.1)	23 (6.5)	0	19 (5.4)	0	0	0 (0)	354 100
6. Hamlet expansion	0 (0)	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 100
7. Waste disposal	0 (0)	20 (26.7)	40 (53.3)	0	15 (20.0)	0	0	0 (0)	75 100
8. Private recreation	0 (0)	0 (0)	0 (0)	84 (81.6)	19 (18.4)	0	0	0 (0)	103 100
Total acres	617 (7.2)	1440 (16.8)	1514 (17.6)	2001 (23.3)	1936 (22.6)	992 (11.6)	0	78 (0.9)	8582 100

\* Defined as Counties 3, 10, 14, 19, 20, 23, 25, 28 and 31. M.D.'s 31, 44 and 90.  
 \*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for non-agricultural subdivisions.  
 \*\*\* See discussion in Chapter III.

single parcel residences and farmstead separations based on the various C.L.I. classes. This is likely due to the fact that multi-parcel developments are allocated in the planning stage and therefore can be directed onto land of poorer quality where possible, whereas single parcels and farmstead separations are already "in place" and therefore an affixed part of the existing parcel of land.

#### 4. Urban Annexations

Table 21 (a and b) shows total annexations by C.L.I. class for the province. It can be seen that the majority of the land used for annexation purposes was on the arable Classes 1-4 (78%). A small percentage was on the non-arable Classes 5 and 6 (10%) with the remainder on non-agricultural land (12%). These results are not surprising since urban centers are often located in agriculturally productive areas. With the increased pressure on Alberta's urban centers in the late 1970's and early 1980's, coupled with the relative scarcity of less agriculturally productive lands adjacent to urban centers, it seemed inevitable that good agricultural land would be taken up through annexation.<sup>1</sup>

Shown in Table 22 are the annual amounts of land lost to annexations. The pattern is irregular, 1981 shows the least amount of activity since 1977. In Table 23 the proportion of annexed land in the four regions is shown. The percentage of land annexed in each of the four regions remained roughly about the same in 1981 when compared to the 1976-1980 average. It should be noted that the 86,000 acres annexed by the City of Edmonton on January 1, 1982, is approximately 10 times the total provincial annexation for 1981.

---

1. On January 1, 1982, Edmonton annexed 86,000 acres. This amount is not included in the total annexed area reported in this study.

Table 21 (a) Annexations: By C.L.I. Class and Arable Land as a Proportion of Annexed Land, 1981

	C.L.I. Class							Total
	1	2	3	4	5	6	7	
All annexations (acres)	635	2151	1903	1966	531	320	0	8563
(%)	7.4	25.1	22.2	23.0	6.2	3.7	0	9.3
							Organic	Undeter- mined
							3.0	800
								9.3
								100

Table 21 (b) Arable Land as a Proportion of Urban Annexed Land, 1981

	C.L.I. Class			Total
	1-2	1-3	1-4	
All annexations (acres)	2786	4689	6655	8563
(%)	32.5	54.8	77.7	99.3
				Non-arable & Undetermined
				1908
				22.3
				100

Table 22 Annexations: By Year, 1976-1981

	1976	1977	1978	1979	1980	1981
All annexations (acres)	6982	8368	17840	34742	23014	8563

Table 23 Annexations by Region, 1976-1980 Total and 1981

	1976-1980		1981	
	Acres ( '000)	%	Acres ( '000)	%
1. Southern	6.9	7.6	.9	10.6
2. Central	38.9	42.8	4.7	55.3
3. Northern	36.1	39.7	2.6	30.6
4. Peace	9.0	9.9	.3	3.5
Total	90.9	100	8.5	100

## 5. Roads

Information on roads was collected under the following headings: roads under municipal jurisdiction a) new roads, b) widening; roads under provincial jurisdiction, c) new roads, d) widening, and e) related areas (maintenance yards, gravel pits, rest stops, etc.). Table 24 shows the amount of land converted to each of the road categories through the years 1976-1981. New highways and highway widening have increased dramatically compared to 1979 and 1980. Municipal road widening has decreased, with new municipal roads dropping by about 50%. The total land used for new roads or road widening in 1981 has remained "normal" relative to the period 1976-1980.

Table 25 shows the regional breakdown of the use categories for roads for 1981. The Peace region has had by far the lowest amount of land converted to roads and highways. The Northern region accounts for the largest share of land being converted to roads and highways. The Southern and Central regions account for the remainder, with the Central region having a slightly larger acreage.

Table 26 gives the breakdown of road land use by C.L.I. class for 1981. The C.L.I. class was determined using the predominant class for the entire quarter section. This may differ from the strip actually used for a highway or road. In total, 71% of the lands used for roads were arable (C.L.I. class 1-4), 24 % was grazing land (Class 5 and 6), the remaining 5 percent was non-agricultural. These percentages are very similar to the figures presented for 1976-1980, (72% Class 1-4, 21.4% Class 5-6, 5 % non-agricultural, 1.5% undetermined).

## 6. Oil and Gas Well Sites and Compressor Stations

### a) Well Sites

Table 3 showed the annual acreage of land used for oil and gas wells and the annual acreage of land in abandoned well sites. These acreage figures are derived by assuming an average well site size of 4.5 acres,



Table 24 Highways: Type of Use and Year, Alberta 1976-1981

Intended Use Category	Year										Total	
	1976	1977	1978	1979	1980	1981	1981	1980	1979	1978		
1. New roads	1512 (acres) 28.1 (%)	1796 35.5	1378 26.5	1146 32.5	1231 20.8	588 11.8	588 11.8	1231 20.8	1146 32.5	1378 26.5	1512 28.1 (%)	7651 25.4
2. Road widening	2600 (acres) 48.4 (%)	2036 40.3	2880 55.3	1885 53.5	3756 63.6	2429 48.7	2429 48.7	3756 63.6	1885 53.5	2880 55.3	2600 48.4 (%)	15590 51.8
3. New highways	1006 (acres) 18.7 (%)	791 15.7	726 13.9	57 1.6	25 0.4	981 19.7	981 19.7	25 0.4	57 1.6	726 13.9	1006 18.7 (%)	3587 11.9
4. Highway widening	193 (acres) 3.6 (%)	149 2.9	143 2.7	288 4.2	36 0.6	582 11.7	582 11.7	36 0.6	288 4.2	143 2.7	193 3.6 (%)	1390 4.6
5. Related sites	66 (acres) 1.2 (%)	284 5.6	81 1.5	151 4.3	858 14.5	411 8.2	411 8.2	858 14.5	151 4.3	81 1.5	66 1.2 (%)	1849 6.1
Total acres	5378 100 (%)	5057 100	5208 100	3530 100	5905 100	4991 100	4991 100	5905 100	3530 100	5208 100	5378 100 (%)	30068 100

Table 25 Highways: Type of Use by Region, 1981

Intended Use Category	Region					Total
	Southern	Central	Northern	Peace		
1. New roads	(acres) 177 (%) 30.1	204 34.7	133 22.6	74 12.6		588 100
2. Road widening	(acres) 297 (%) 12.2	611 25.2	1414 58.2	107 4.4		2429 100
3. New highway	(acres) 266 (%) 27.1	335 34.1	80 8.2	300 30.6		981 100
4. Highway widening	(acres) 297 (%) 51.0	285 49.0	0 0	0 0		582 100
5. Related sites	(acres) 166 (%) 40.4	63 15.3	140 34.1	42 10.2		411 100
Total acres	(%) 1203 24.1	1498 30.0	1767 35.4	523 10.5		4991 100

Table 26 Highways: Type of Use and C.L.I.I.\* Class, Alberta, 1981

Intended Use Category	C.L.I.I. Class										Undeter- mined	Total
	1	2	3	4	5	6	7	Organic	7	Organic		
1. New roads (acres) (%)	27 4.6	119 20.2	114 19.4	166 28.2	100 17.0	50 8.5	7	5	7	5	0	588 100
2. Road widening (acres) (%)	131 5.4	455 18.7	566 23.3	665 27.4	289 11.9	197 8.1	40	86	1.6	3.5	0	2429 100
3. New highways (acres) (%)	47 4.8	135 13.8	346 35.3	125 12.7	134 13.7	85 8.7	65	44	6.6	4.5	0	981 100
4. Highway widening (acres) (%)	1 .2	44 7.6	91 15.6	146 25.1	284 48.8	16 2.7	0	0	0	0	0	582 100
5. Public works related sites (acres) (%)	110 26.8	158 38.4	67 16.3	34 8.3	15 3.6	24 5.8	3	0	.7	0	0	411 100
Total by C.L.I.I. Class (%)	316 6.3	911 18.3	1184 23.7	1136 22.8	822 16.5	372 7.5	115	135	2.3	2.7	0	4991 100

\* C.L.I.I. values are estimated in most cases. See discussion in Chapter II.

as discussed in Chapter II. New well sites remained fairly constant throughout the years 1976-81. However, the annual acreage of abandoned well sites rose quickly from 1976 to 1980 and decreased slightly in 1981. The acreage of abandoned well sites presented as a percentage of new well sites has continued to increase from 1.7 percent in 1976 to 24.1 percent in 1981.

Table 5 showed the distribution of new and abandoned wells among C.L.I. classes. Interpretation of Table 5 should be done with care. The C.L.I. classification for new wells probably underestimates the true capability of the land for agriculture (see Chapter II). Also, with respect to abandoned wells, the productivity of the abandoned (and reclaimed) well site may not be equal to what it was before disturbance, and the figures in Table 5 may therefore overestimate the productivity of reclaimed well sites. This would not explain the apparently higher productivity of abandoned rather than new well sites in Table 5 (63 percent of new wells and 74 percent of abandoned wells are on Class 1-4 land), but it would suggest that the productivity of the reclaimed wells is somewhat overestimated. The regional distribution of new and abandoned well sites was unavailable.

b) Compressor stations

Table 27 shows the regional and C.L.I. class distribution of land being used for compressor stations. No acreage was available on a case by case basis, therefore, a number of county accessors were contacted and an average parcel size for compressor stations was determined (3.75 acres/station). The staff at E.R.C.B. stated that the list given to us is 90 - 95% complete and is comprehensive up to the end of 1981, no construction dates were available on a year-to-year basis. Since the information on compressor stations was a compilation of several years and no dates were available, they were not included in the earlier tables, however the information is still useful and therefore included in the study.

Table 27 Compressor Stations: Regional Breakdown into C.L.I. Classes\*, As of December 1981

Region	C.L.I. Class										Undeter- mined	Total
	1	2	3	4	5	6	7	Organic	Undeter- mined	Total		
1. Southern (acres) (%)	30 3.8	64 8.2	71 9.1	289 37.0	244 31.3	45 5.8	0	38 4.8	0	780 100		
2. Central (acres) (%)	26 3.7	169 23.9	139 19.7	158 22.3	150 21.3	60 8.5	0	4 0.5	0	705 100		
3. Northern (acres) (%)	53 7.2	116 15.9	233 31.8	195 26.7	86 11.8	26 3.6	0	19 2.6	4 0.5	731 100		
4. Peace (acres) (%)	0	26 43.8	15 25.0	15 25.0	0	0	0	4 6.3	0	60 100		
Total acres (%)	109 4.8	375 16.5	458 20.1	657 28.8	480 21.1	131 5.7	0	65 2.9	4 0.2	2279 100		

\*: C.L.I. values are estimated in most cases. See discussion in Chapter II.

Table 28 Coal Strip Mines, Alberta, 1981

Mine Location	C.L.I. Classification							Total
	1	2	3	4	5	6	7	
(acres)								
A. Northern Region								
1. Whitewood	0	0	35	0	0	35	0	70
2. Highvale	0	0	0	146	37	0	0	183
B. Central Region								
1. Vesta	0	0	117	0	0	0	0	117
2. Paintearth	0	0	0	0	126	0	0	126
3. Diplomat	0	0	188	0	0	0	0	188
4. Roselyn	0	0	0	5	0	0	0	5
Total	0	0	340	151	162	35	0	689
Reclaimed Coal Strip Mines								
Total (acres)								
A. Northern Region								
1. Whitewood								166
2. Highvale								100
B. Central Region								
1. Vesta								130
2. Paintearth								0
3. Diplomat								134
4. Roselyn								0
Total								530

Approximately 70% of the land used was arable (Class 1-4), 27% on Class 5-6 (grazing) and the remainder non-agricultural land. The Peace region only registered 60 acres of the 2,279 total, with the remaining acreage evenly distributed among the Southern, Central and Northern regions.

## 7. Coal Strip Mines

Table 3 showed the annual distribution of land disturbance and reclamation by coal strip mines. Table 4 indicated the distribution of disturbed land among C.L.I. classes. The C.L.I. class for reclaimed land is not known, though reclamation policy states the objective is to return the land to a productivity at least equal to what it was before disturbance.

Table 28 shows the six mines which were dealt with and the area disturbed broken down into the C.L.I. classifications. The total reclaimed land for 1981 is also shown for each mine.

## 8. Other Non-Agricultural Uses

### a) Powerlines

The Energy Resources Conservation Board reported electric transmission and distribution lines in Alberta as shown in Table 29:

Table 29 Miles of Powerlines in Alberta: Year and Type

Year	<u>Type of Line</u>			
	<u>Transmission (over 60kV)</u>	<u>Sub-transmission and Distribution (60kV and below)</u>	<u>Rural Electrification Area Lines</u>	<u>Utility Owned Farm Lines</u>
1980	9,262	35,958	42,415	6,239
1981	9,692	38,181	42,105	6,864

Source: Adapted from E.R.C.B., "Alberta Electrical Industry, Annual Statistics, 1981". E.R.C.B. 82-28, p.29.

Correspondence with power companies indicates that there were approximately 342 miles of 240 kV lines installed in 1981. These lines have a 90 foot right-of-way which is not permitted on road allowances. The remaining lines over 60 kV have an average right-of-way of 40 feet, much of this is placed on road allowances. The 60 kV and below line has an approximate right-of-way of 25 feet and almost all is on existing road allowance.

Using the mileages given in Table 29 and the appropriate right-of-way widths, the following acreages result:

Type of Line	Right-of-way		Miles	Acres/Mile	Acres
	Width				
240 kV	90 ft		342	10.91	3,731
Other lines over 60 kV	40 ft		88	4.85	427
60 kV and below	25 ft		2,223	3.03	<u>6,736</u>
Total acres					10,894

There are three main factors which must be considered when looking at the total acres figure for powerline right-of-ways.

1. A large portion of powerlines under 240 kV are located on road allowances.

2. A portion of new powerlines may be located in the non-agricultural green zone.

3. The land loss due to power poles or towers is very small when compared to the right-of-way area. The inconvenience of farming around poles and towers is probably more important than the actual loss of land.



All the above explain why the figure 10,894 acres is an overestimate of the loss to the agricultural land base. At present, it is not possible to determine the exact impact of powerlines on the provincial agricultural land base without considerable additional investigation.

b) Pipelines

Table 30 shows additions to pipeline mileage for 1981.

Table 30 Miles of Pipelines in Alberta, 1981

<u>Type of Line</u>	<u>Miles</u>
Oil Lines	295
Secondary Oil Lines	79
Gas Lines	535
Secondary Gas Lines	3,105
Water Lines	481
Distribution Lines	4,244
Flow Lines	<u>1,654</u>
Total	<u>10,393</u>

The width of right-of-ways for pipelines depends on the pipe size and whether or not there is more than one pipeline within its boundaries. An average width is 50 feet for most types of pipelines, with the variation being 7 to 130 feet. Based on an average of a 50 foot width the total area of pipeline right-of-ways for 1981 alone is 62,989 acres.

The above quoted mileage and acreages for pipeline right-of-ways over estimates the impact on agricultural land. Much of the pipeline mileage is laid on non-agricultural land, and a large amount of the agricultural land which is affected is usually reclaimed within a reasonably short period of time. Therefore, the actual loss to the agricultural land base is considerably less than the figure shown above.

## c) Railroads

The total mileage of railroad abandonment is given in Table 31. Using a main-line right-of-way of 115 feet, (given in the 1976-80 inventory report), the railway abandonment acreage for 1981 is 1,344 acres. This compares with 690 acres in 1980.

Table 31 Railway Abandonment\*

	<u>Miles</u>	<u>Municipalities</u>
1980	16.6	County 4
	9.9	County 14
	<u>23.0</u>	I.D. 10
1981	24.9	County 23
	33.6	County 16
	8.3	County 19
	20.8	M.D. 48
	<u>8.8</u>	I.D. 7
	<u>96.4</u>	

\* Source: Agricultural Transportation by Production Economics Branch Alberta Agriculture.

Primary usage on these lines are transportation and utility corridors. However, permits are issued for alternative uses where suitable. For example where the adjacent use is agricultural, permits could be given to increase agricultural use in the railway right-of-way. There is 5-10 percent which is reserved for recreation and an additional 10 percent reserved for wildlife. Other factors affecting the possible useage of railway right-of-ways are:

- (a) Accessibility to portions of land cut off by the railway.
- (b) Condition of land close to railway (gravel, weeds, ditches, etc.).
- (c) Actual structure of the rail line.

Keeping both the physical and administrative constraints in mind, the actual addition of agricultural land resulting from railway abandonment is quite possibly well below the acreages given.

d) Airports

Acreages and locations given in Table 32 were obtained from the Aviation Branch, Department of Transportation.

Table 32 Airport Acreages for 1981

<u>Location</u>	<u>Acres</u>
Mayerthorpe (County 28)	65.9
Viking (County 9)	75.0
Lloydminster (County 24)	480.0
Manning (I.D. 22)	128.0
Olds-Didsbury (County 17)	100.0
Killam-Sedgewick (County 29)	76.3
Vauxhall (M.D. 14)	<u>127.3</u>
	1052.5

It is very difficult to measure the direct impact of airport expansion on Alberta's Agricultural Land Base, the actual loss of farm land is likely considerably less than the figures in Table 32 show.

e) Gravel Pits

Information on sand and gravel pits was obtained from the Department of Environment, Land Reclamation Division. The Department has done an inspection of sand and gravel pits in Alberta. The percentage proportion of gravel pits on arable and non-arable land is roughly equal, (57.1% on Class 1-4, 42.9% Is 5-organic). These figures perhaps somewhat overestimate productive capability of the land because of C.L.I. determination. Since the C.L.I. designation was made on the basis of the predominant class of the quarter section the gravel pits may have been slightly "over-rated". Table 33 shows the regional breakdown of sand and gravel pits along with the C.L.I. designation.

Table 33 Total Inspected Gravel Pits Area as of 1982, By C.L.I. Class\*

		C.L.I. Class										
		1	2	3	4	5	6	7	Organic	Total		
A.	Southern											
	Gravel pits (acres)	15	166	261	449	805	567	8	0	2270		
	(%)	.7	7.3	11.5	19.8	35.4	25.0	.4	0	100		
B.	Central											
	Gravel pits (acres)	54	915	1434	543	2152	451	0	312	5861		
	(%)	0.9	15.6	24.5	9.3	36.7	7.7	0	5.3	100		
C.	Northern											
	Gravel pits (acres)	666	558	1272	1606	989	736	85	131	6042		
	(%)	11.0	9.2	21.0	26.6	16.4	12.2	1.4	2.2	100		
D.	Peace											
	Gravel pits (acres)	0	136	251	93	13	24	40	0	557		
	(%)	0	24.4	45.1	16.7	2.3	4.3	7.2	0	100		
	Total acres	735	1774	3217	2691	3959	1778	133	443	14730		
	(%)	5.0	12.0	21.8	18.3	26.9	12.1	.9	3.0	100		

\* C.L.I. values are estimated in most cases. See discussion in Chapter II.

CHAPTER IV  
CONCLUSIONS & IMPLICATIONS

Table 1 showed that the total net addition in Alberta's agricultural land base in 1981 was 30.6 thousand acres. One should keep in mind that this figure does not take into account such losses as pipeline right-of-ways, powerline right-of-ways, gas plants, compressor stations and gravel pits. Also the figure of 30.6 thousand acres is not adjusted for prior use of converted land which would add to the total net addition of agricultural land. The major source of new agricultural land was the disposition of public lands by Alberta Energy and Natural Resources; the major losses of agricultural land were to subdivisions, urban annexations, and oil & gas well sites. A distinction can be drawn between permanent and temporary losses of agricultural land. Table 11 showed the relative impact of these; permanent losses (including subdivisions, annexations and roads) accounted for approximately 41 thousand acres or 50 percent of total removals of agricultural land. The remaining 50 percent of agricultural land removals (for wells, strip mines and public land reservations) can be considered temporary, though productivity may be affected. The years 1976-80 showed that about 66 percent of all removals were permanent, substantially different from the "50-50" split of 1981.

Average annual additions to the agricultural land base during the period 1976-1980 were 77.3 thousand acres (approximately 121 sections of land), while average annual losses were 78.1 thousand acres (approximately 123 sections of land). In 1981 there were 113.2 thousand acres added to the agricultural land base (176 sections of land, 46 percent above the 1976-80 average). It however, is significant that dispositions leading to title are dramatically down from the 1976-80 average. Also during 1981, there were 82.6 thousand acres of land removals (about 129 sections of land, 5 percent above the 1976-80 average). The total additions have increased substantially while removals of agricultural land have remained relatively constant. When comparing 1980 and 1981 however, this change is not as noticeable (see Table 3).

One of the significant conclusions from this study has to do with the losses and gains of agricultural land in different capability classes (Tables 4 and 11). There was an overall net loss of 10.4 thousand acres of C.L.I. classes 1 and 2, this represents approximately .09 percent of the province's 11.4 million acres of C.L.I. class 1 and 2 land.<sup>1</sup> However, there is a slightly different picture when Class 3 is taken into consideration (net gain of 14.0 thousand acres in Class 3 land). When C.L.I. classes 1 to 3 are totalled the result is a net addition of 3.6 thousand acres to the agricultural land base. For C.L.I. classes 3 and 4 and poorer there was a net gain of 40.2 thousand acres, or about .11 percent of the province's 38 million acres of this type of land. It can be seen by the results presented in this study that there is in fact a net addition of agricultural land, however this addition occurs in C.L.I. classes 3-7 and Organic. Even though the losses of higher productive agricultural land is relatively small compared to the actual or potential agricultural land base, the shift towards unimproved land and loss of our best lands may have an impact on future agricultural potential over a period of time as such shifts accumulate.

Another perspective on the loss of agricultural land is provided by distinguishing between permanent and temporary removals of agricultural land (Table 11). Permanent removals (subdivisions, annexations, and roads) accounted for 18.8 thousand acres of C.L.I. class 1 to 3 land in Alberta for 1981, or about 69 percent of total agricultural land removals (in Classes 1 to 3). This compares with 30.7 thousand acres of C.L.I. classes 1 to 3 added to the agricultural land base in 1981.

---

1. Lands Directorate, 1977, Canada Land Inventory: Agricultural Land and Urban Centers, Fisheries and Environment Canada, Report No. 11, July.

Permanent losses of agricultural land can also be expressed as a percentage of the total provincial supply of land within each of the C.L.I. classes:

<u>C.L.I.</u> <u>Class</u>	<u>Permanent Removals as Percent</u> <u>of Total Provincial Acres<sup>1</sup></u>
1	.1%
2	.08
3	.06
4	.05
5	.03
6	.03
7	*

\* Percentage is not significant.

These figures show the same results as those for the 1976-80 study. Even though the percentages are relatively small (all are less than one percent) keeping in mind this data represents one year, 1981, land of high agricultural capability is consistently removed at a faster rate than is land of lower agricultural capacity (which is relatively more abundant). Class 1 land is being removed twice as quickly as is Class 4 land, in relation to their respective total supplies.

---

1. Source of C.L.I. acreages: Lands Directorate, 1977, Canada Land Inventory: Agricultural Land and Urban Centers, Fisheries & Environment Canada, Report No. 11. Includes only land classified for C.L.I.

The various types of conversions were found to differ considerably in the proportion of each C.L.I. class which was used for conversion (Table 5). Urban annexations for example, had the largest percentage removal from Classes 1-3 (54%) and when Classes 1 to 4 were combined (77%). The distinction between annexation and other types of conversions is particularly noticeable with respect to the proportionate use of Classes 1 and 2. The results shown in Table 5 must be viewed along with those in Table 1 in order to appreciate the relative magnitude of the different types of conversions on the productivity of the entire agricultural land base.

Non-agricultural subdivisions showed some interesting results for 1981, as they did in the 1976-80 study. The bulk of the conversion activity in the subdivision category was in single parcel county residence, multi-parcel C.R.'s and farmstead separations. These three accounted for over 83 percent of all subdivision activity in the province. Over 80 percent of the land converted to subdivision in categories single parcel C.R.'s and farmstead separations were arable (Classes 1-4). Multi-parcel C.R.'s used the lowest proportion of arable land (Classes 1-4), with the exception of the private recreation category which accounted for only 604 acres.

Multi-parcel county residential development is subject to more restriction with respect to the use of agriculturally productive land. Multi-parcel developments used 1.4 thousand acres of C.L.I. class 1 to 3 land in 1981 which represents 19 percent of the total land used by such development. Once again, the method of estimation of C.L.I. values may have somewhat overestimated the agricultural capability of the subdivided land, as discussed in Chapter II.

The locational differences between land which is being added to and removed from the agricultural land base were identified (Table 6). There was a net loss of 25.1 thousand acres in the Southern, Central and Northern regions (white zone) in 1981, while there was a net gain of



73.3 thousand acres in the Peace region (yellow zone). Well site information was not available on a regional basis, however this information would likely moderate this regional imbalance only slightly.

Even though there was an overall net gain of agricultural land in the province, the productivity and locational shifts of additions and losses to the agricultural land base have various consequences. The production use is shifting away from the province's major population centers and has also increased the transportation distance for provincial agricultural exports. The increasing proportion of lower quality land in the agricultural land base will lead to such things as increased production risk due to climate, lower crop yields and crop quality and fewer crop choices for the producers. This trend of losing improved land and gaining unimproved land will necessitate heavy investments in land clearing and drainage which will increase the cost of production.

