



AGRICULTURE PLAN

Planning and Development Services
December 1998



Acknowledgments

The Agriculture Plan was initiated by City Council and was prepared by City of Kelowna, with guidance from an Advisory Committee of community interests represented by the following members:

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The contribution of information and guidance from other agencies such as the Ministry of Agriculture and Food, B.C. Land Commission, B.C. Fruit Growers Association, and Okanagan Valley Tree Fruit Authority is also greatly appreciated. In addition, Mr. Stu Mould of Mould Engineering Services Ltd provided assistance with a Water Servicing Study and Mr Herb Luttmerding and Mr. John Vielvoye provided assistance with an Agricultural Land Capability Study.

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FOREWORD

Urban areas have historically developed near good farmland, and in many instances, cities were built on fertile floodplains. Agriculture was a basis for growth and economic development. While increasing urban growth, including suburban sprawl, has resulted in the loss of some productive farmland the issue today is one of economic viability and enhancement of the industry to survive in an increasingly competitive and diverse market.

"Rural uses in many parts of the Province are under tremendous pressure. Yet while the use of these lands is evolving, we have several critical land, water, environmental, and settlement issues to address if we are to work towards achieving economic, environmental, and social sustainability for future generations." (1)

The ability to produce food and other agricultural products is no less important than management of urban growth or environmental stewardship.

The Okanagan Valley is one of only three major fruit producing areas and one of only two grape growing areas in Canada. The Valley is also becoming a major population centre and the competition for a limited supply of land threatens the agriculture industry, particularly during uncertain economic conditions within the industry, both locally and internationally.

Rural land is perceived as many things by different segments of our society: farmland or alternative crop land, hobby farms, green space, recreation, amenity or aesthetic value, rural residential, investment / speculative land, wildlife habitat, among others.

Limited agricultural land should be regarded as a precious resource, as it provides a basic human need - food, and makes a significant contribution to the local economy as well as the social / visual character of our community.

This document is intended to provide linkage between provincial and local initiatives and expand the role of the City mandate and other local agencies in land use planning for agriculture, as a "made in Kelowna" program.

(1) K. B. Miller, Chair, Agricultural Land Commission from "Planning for Agriculture: The Local Contribution".

AGRICULTURE PLAN

PURPOSE

The major objectives of the Agriculture Plan are to consider issues relating to agricultural viability and the urban / rural relationship, from the perspective of the municipal mandate.

As part of the 1995/96 Planning Program, Kelowna City Council endorsed the preparation of an Agriculture Plan toward enhancement of the industry and the City's role in decision-making with respect to agricultural matters.

The Agriculture Plan provides a planning framework to guide future activities in and adjacent to rural/agricultural areas, as a refinement to the level of direction provided by the City's Official Community Plan. The Agriculture Plan has also been considered in the context of the City's Strategic Plan adopted by the City in 1992.

Given that the Strategic Plan and the Official Community Plan have, as the core principle, stressed compact urban form and the notion of growing up not out, there is intended to be greater certainty regarding the stability of the agricultural land base. As noted in the ALC publication "Planning for Agriculture - The Local Contribution", efforts must be directed to ensure the social and economic viability of farming.

Overview Of Planning Process

The preparation of the Agriculture Plan was actively commenced late in 1995, with the primary goal of enhancement of the industry, while recognizing the mandate of the City.

As part of the process a Planning Advisory Committee was established to provide expertise and guide the project. This committee includes representatives from the various sectors of the agriculture industry, marketing agencies, the Ministry of Agriculture and Food, the Okanagan Valley Tree Fruit Authority, BC Fruit Growers Association, Chamber of Commerce, and local resident's associations.

An issue identification stage was completed throughout the spring and summer of 1996, toward the review of options for agricultural enhancement within the community, and preparation of the draft document. Discussion is focused on the areas of influence within the control of the City and relate to legislation (e.g. zoning, subdivision), environment, transportation, water supply, urban rural conflict issues, and agricultural enhancement (irrigation, drainage) and economic enhancement (agri-tourism, education, promotion etc.)

Public Involvement Program

The Scope of Work embodied a series of opportunities for City Council and Provincial review, and the involvement of agriculturists, processing industry representatives and other agricultural agencies as well as other business interests, applicable resident organizations, and the general public, in the planning process.

Consultation with Affected Agencies

As part of this process there has been consultation with the Ministry of Agriculture and Food, local Irrigation Districts, BC Assessment Authority, Agricultural Land Commission and staff, BC Fruit Growers Association, and the Okanagan Valley Tree Fruit Authority.

Preparation of associated mapping including ALR, Soil Capability for Agriculture, BCAA Farm Classification, Grape Suitability, and Tree Fruit Suitability based on agency input is also included.



BACKGROUND

Description Of The Plan Area

Location and Context

The City of Kelowna is centrally located in the Okanagan Valley, a north-south tending trench bounded by the Okanagan Highlands of the Thompson Plateau. Okanagan Lake forms the westerly boundary of the City with some 32.2 kilometres (20 miles) of shoreline. **Map 1 - Location Map and Sub-area Boundaries** indicates of the extent of the Agricultural Plan Study Area and the sub-areas of a rural – agricultural nature.

The City of Kelowna occupies approximately 213.9 square kilometres (82.6 square miles) of land and 14.5 square kilometres (5.6 square miles) of water area. Approximately 42 % (8,927 ha / 22,059 acres) of that land area is within the Agricultural Land Reserve (ALR). **Map 2 - Agricultural Land Reserve** indicates the extent of ALR within the City of Kelowna.

Sub-areas

The Study Area includes all lands outside the urban areas of the community, excluding rural subdivisions - ALR and non-ALR land. Some of the ALR lands are not actively farmed, while there are non-ALR lands that are currently utilized for some agricultural pursuits.

The following sub-areas referred to throughout the text are identified on **Map 1**: Southwest Mission, Southeast Kelowna, Mission Creek / Benvoulin Flats, Belgo / Black Mountain, Rutland Bench, North Rutland / Highway 97, Highway 97 North, North Glenmore / Dilworth.

Climate

Most of the region is in the dry shadow of the Cascade Mountains that form a barrier to westerly storms. The climate in the Okanagan Valley consists of long, warm, sunny summers and comparatively short, mild, and cloudy winters. Kelowna has an average July temperature of 21 degrees Celsius (70 F) and an average January temperature of 2 degrees Celsius (36 F). The average annual sunshine is over 2000 hours and the average annual precipitation is 31 cm (12 inches).

From an agricultural viewpoint, the Okanagan Valley is considered to have one of the most favourable climates in the Province. A long frost-free period (150 - 200 days), and high temperatures during the growing season permit the raising of many heat sensitive crops. Moisture deficiencies, however, mean that irrigation is a necessity.

Physical Characteristics of Plan Area

Topography

Kelowna is isolated between Okanagan Lake and slopes to the south and east of the City, with a ridge extending along the shoreline in the Glenmore / McKinley area. Other areas of significant topographic constraint throughout the City are generally associated with stream corridors.

Topographic characteristics and elevations in some areas impose limitations on farm use options. Slopes to about 15% are generally considered suitable for the production of most crops, including those requiring at least one mechanized cultivation during the year. Slopes up to between 25 and 30% are generally acceptable for tree fruits and grapes since these crops do not usually require annual cultivation. Approximately 15 % of the City's land areas have slopes in excess of 30 %, which are generally considered unsuitable for agricultural activities other than grazing and pasture. **Map 3 – Slope Classification** indicates the location and range of slopes throughout the City. Elevations in the City range between 349m (1145 ft) and 1260 m (4134 ft).

Surficial Geology

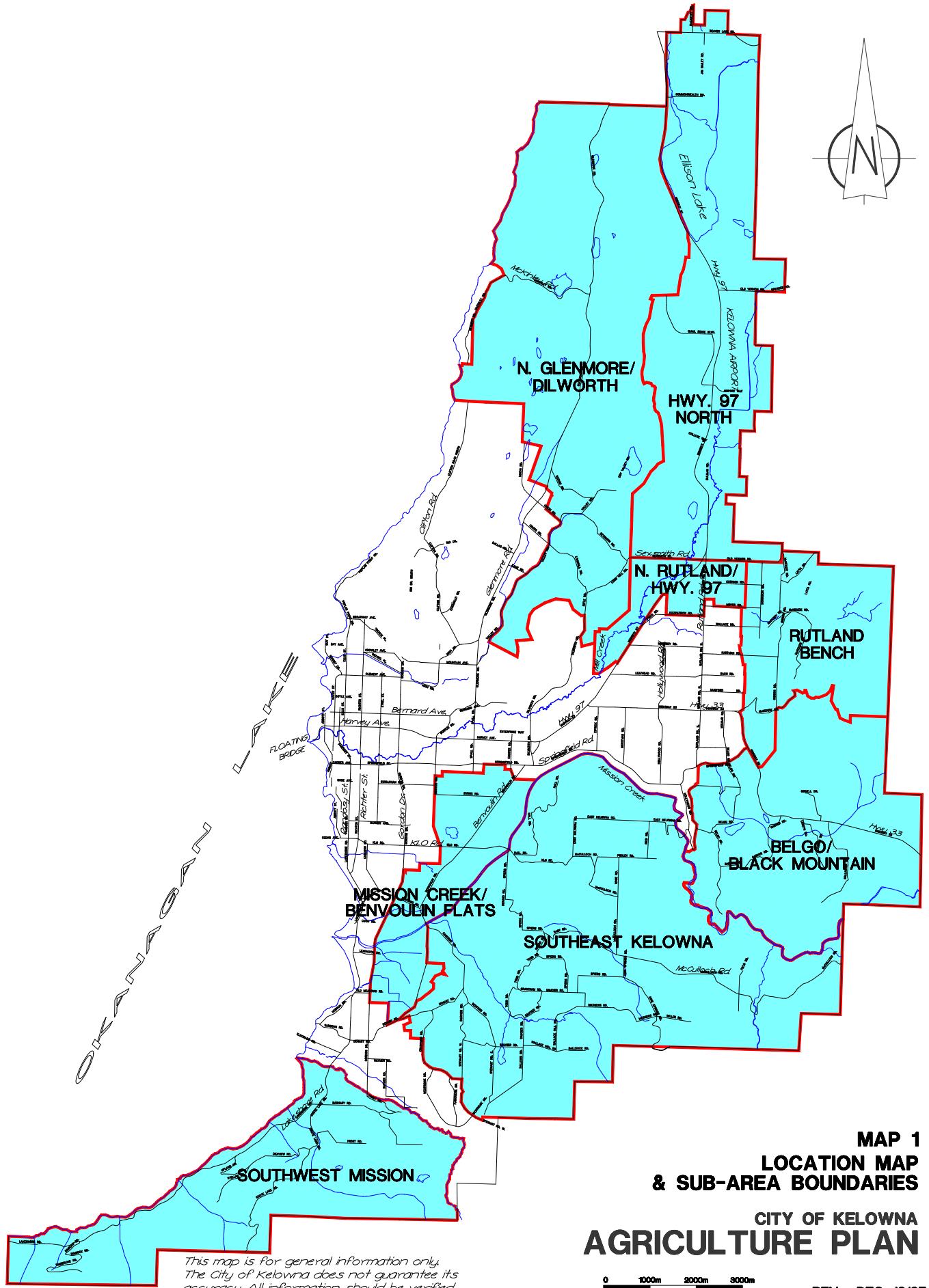
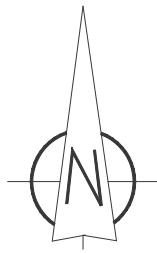
Bedrock composition and structure are important factors determining the shape of the local landscape. In addition, much of Kelowna's landscape has been shaped by the advance, stagnation, and retreat of Pleistocene glaciations around 10,000 years ago, and by recent geomorphic processes.

Surficial geological characteristics vary within the City, with formations generally resulting from activities of the Pleistocene glacial period. As the ice receded, the terrain was left draped with "glacial till", a layer of mixed stones, silt, and clay. As a result of the influence of organic matter, topography, climate, and time, the glacial till has in many places formed cultivable soils. **Map 4 - Surficial Geology** indicates the geological make up of the City and, in general, most areas have some suitability for agriculture based on topography, depth to bedrock, and drainage characteristics, except for those areas indicated as bedrock and shallow bedrock.

Soils

Dark Brown soils predominate in the lower elevations of the Central Okanagan. These soils have a relatively high organic content and are quite fertile. When irrigated, they are capable of producing a large variety of fruits and vegetables. At higher elevations, the Dark Brown soils yield first to Black soils, which support grasses and timber, and then to Brown-Podzolic-Grey Wooded soils, which support most of the forest cover.

The majority of agricultural lands within the City are utilized for orchards, vineyards, grazing, or forage operations, which generally maintain the ground cover of the topsoil. Soil erosion potential is limited to those areas that are actively cultivated or areas where flooding or overland water run-off may occur.



MAP 1
LOCATION MAP
& SUB-AREA BOUNDARIES

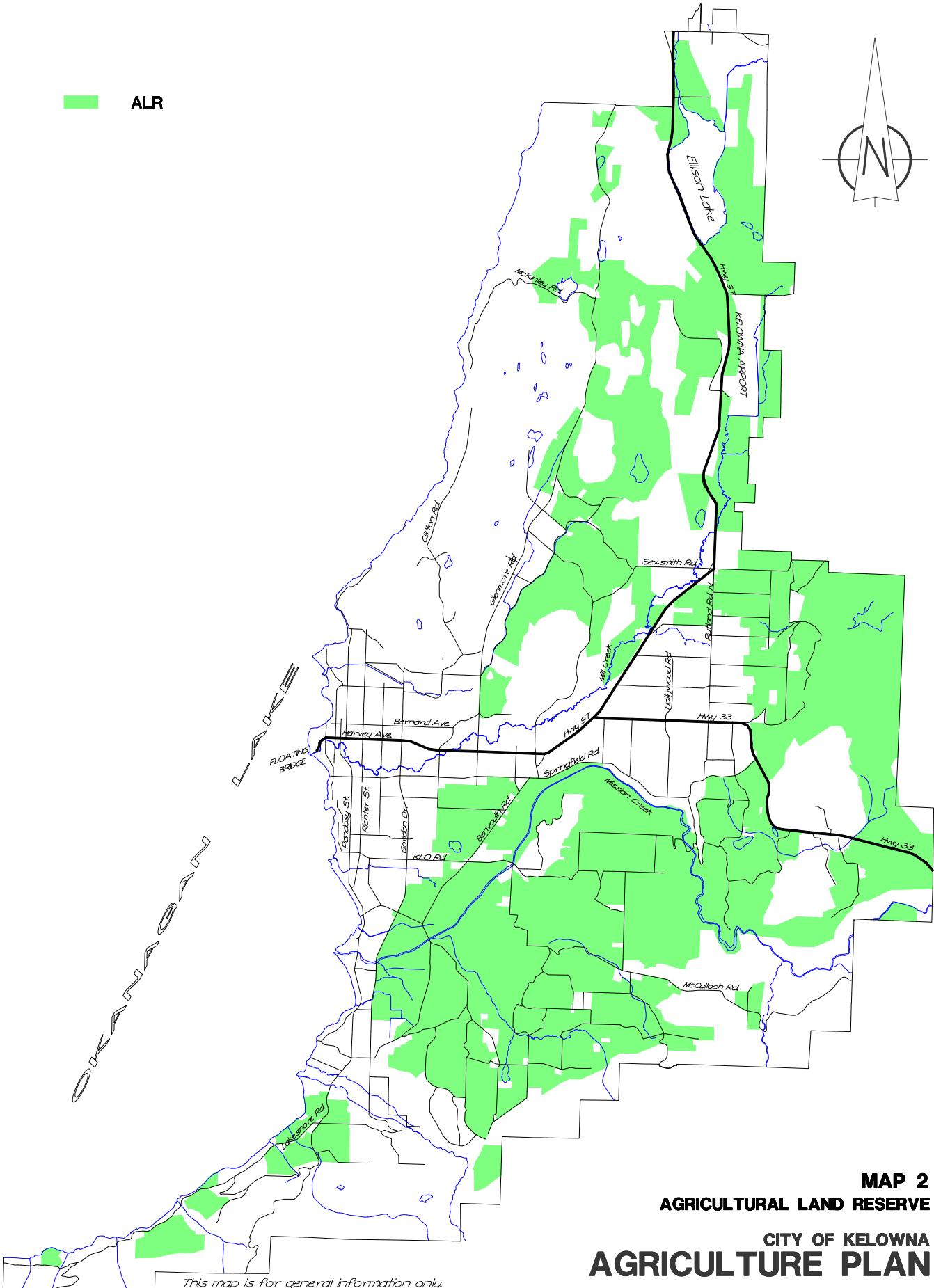
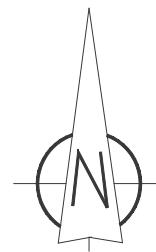
CITY OF KELOWNA
AGRICULTURE PLAN

This map is for general information only.
The City of Kelowna does not guarantee its
accuracy. All information should be verified.

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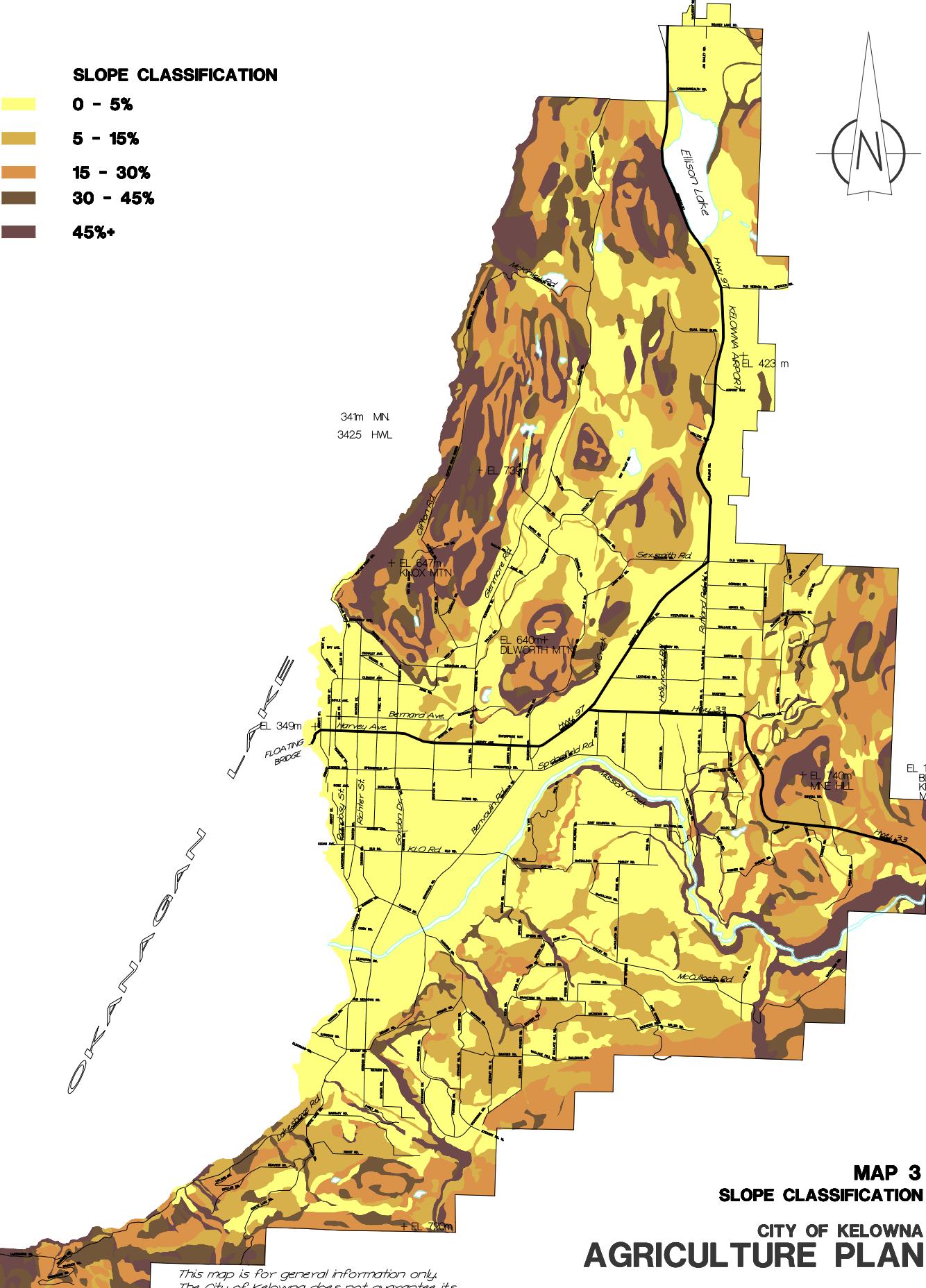
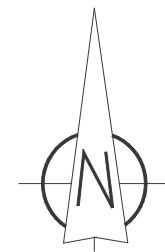
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 ALR



SLOPE CLASSIFICATION

- 0 - 5%
- 5 - 15%
- 15 - 30%
- 30 - 45%
- 45%+

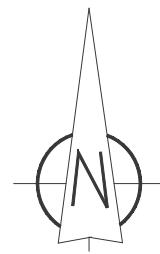


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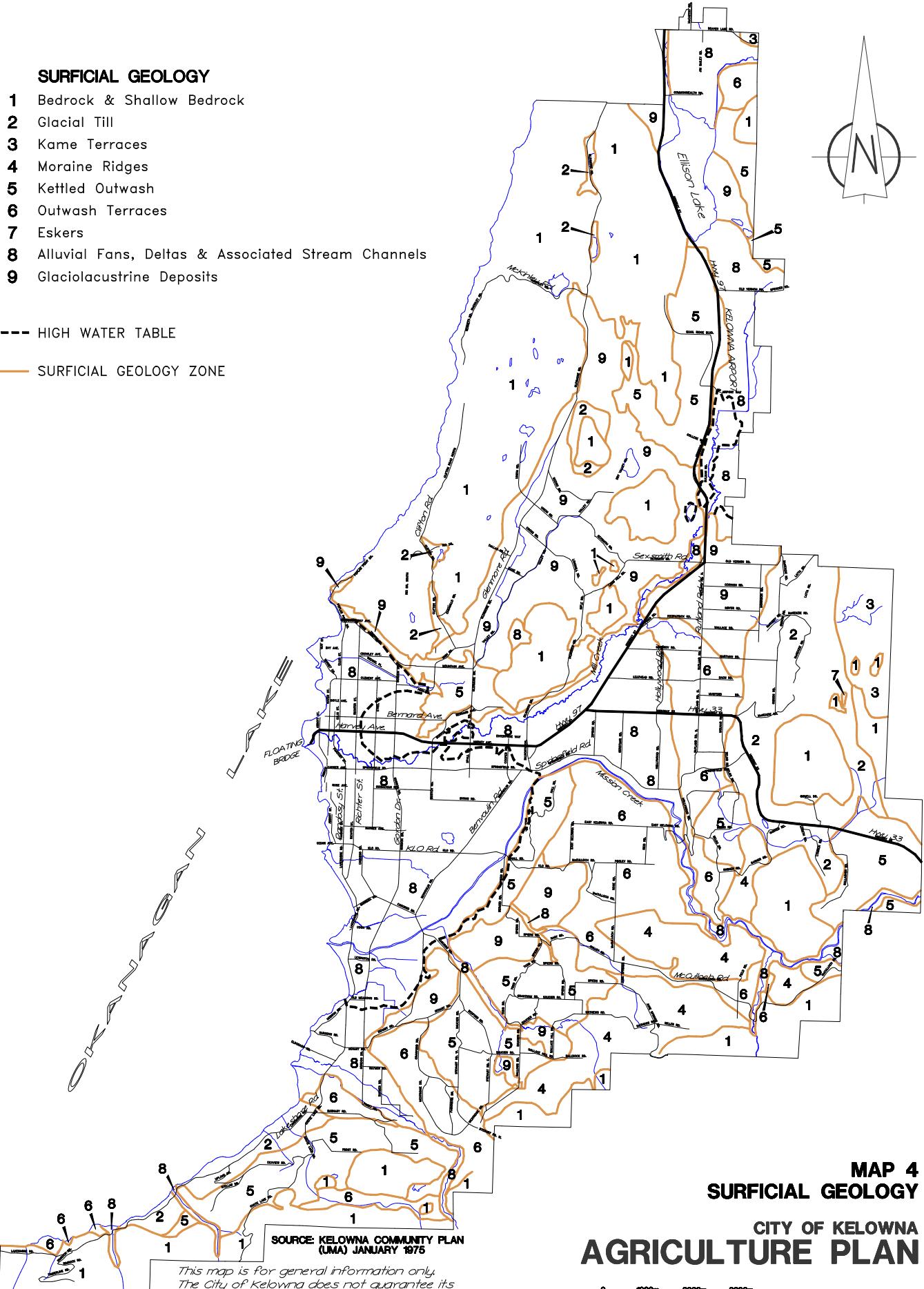
SURFICIAL GEOLOGY

- 1 Bedrock & Shallow Bedrock
- 2 Glacial Till
- 3 Kame Terraces
- 4 Moraine Ridges
- 5 Kettled Outwash
- 6 Outwash Terraces
- 7 Eskers
- 8 Alluvial Fans, Deltas & Associated Stream Channels
- 9 Glaciolacustrine Deposits



--- HIGH WATER TABLE

— SURFICIAL GEOLOGY ZONE



A sand and gravel inventory and planning exercise is in progress at this time, which will consider aggregate sources, needs, land use and transportation issues. The extraction of sand and gravel within the City has a bearing on agricultural activities, and will be a topic to be addressed as part of that initiative.

Hydrology

The Official Community Plan identifies and provides protective measures for streams and waterbodies, based on a Natural Features Inventory. The City of Kelowna has also undertaken Basin Management Plans for the major watercourses within the City, towards identifying works necessary to manage drainage concerns. In addition, a Wetland Habitat Management Strategy is currently being prepared to inventory wetland areas and recommend management strategies. **Map 5 - Watercourses, Waterbodies, and Wetlands** indicates the location of existing watercourses and water bodies from the Natural Features Inventory and wetlands from the draft Wetland Habitat Management Strategy, as related to the location of agricultural lands.

Environmentally Sensitive Areas / Natural Features

Environmentally sensitive areas in Kelowna are generally limited to hillside locations of steep slopes or watercourse / wetland areas. As slopes over 30 % are generally unsuited for agriculture that leaves lands containing watercourses or other wetland areas as those lands that may be impacted by agricultural pursuits

Not only do these areas represent hazards to other uses due to potential flooding; they are in turn, sensitive to impacts from other uses involving urban encroachment, recreational use, pesticides, fertilizers, and animal husbandry. In addition, watercourses and wetlands represent other values from a fish and wildlife habitat perspective that need to be protected.

The OCP mapping that outlines environmentally sensitive areas identifies legal parcels and therefore more of a site is designated than may be actually influenced by specific hillside or water features. This mapping will require refinement, as time, funding, and need arises, to more fully delineate the areas of influence.

The Natural Features Inventory (1991) outlined many of the significant features throughout Kelowna. Again, this Inventory is based primarily on land based features (uplands) and water based features (watercourses, lakes, ponds, and wetlands). However, there are several features that are significant for other reasons: Mission Creek Regional Park, Gallaghers Canyon, and Woodhaven Nature Preserve. In addition, view corridors to rural areas (west side of Dilworth Mountain, Rutland Bench area, Southeast Kelowna) form much of the context for the urban portion of the City. Many of these view corridors occur in the rural – agricultural sectors of the City, and it must be recognized that this “borrowed greenspace” is in reality a working landscape of agricultural businesses.

History of Area and Development

General History

The agricultural history of this area is strongly related to the provision of water. Originally, ranch lands were the order of the day, giving way to cultivated lands and orchards in areas where irrigation water from creeks, diverted to ditches, was available. Orcharding became a substantial activity with the arrival of the railway, which allowed easier shipping of perishable produce. However, orchards did not become viable until the 1930's, after the establishment of Irrigation Districts in Glenmore, Southeast Kelowna, Okanagan Mission, and Black Mountain.

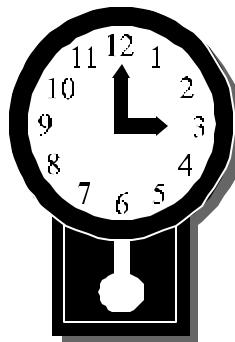
The growers organized to form co-operative packinghouses, which in turn formed a marketing arm (B.C. Tree Fruits) to manage the distribution of local production. Sun Rype was established in the 1940's to process culled fruit into juice.

The grape and wine industry began in the 1930's; however, quality was low relative to the cost of grapes. Government introduced price protection in the 1970's provided some industry shelter, but reduced market incentive for quality improvements. Changes to legislation governing the wine industry, plus elimination of price controls through recent trade agreements, forced a general restructuring of the industry that has seen a change to higher quality grapes, an improved product, and positive recognition of the industry locally and internationally.

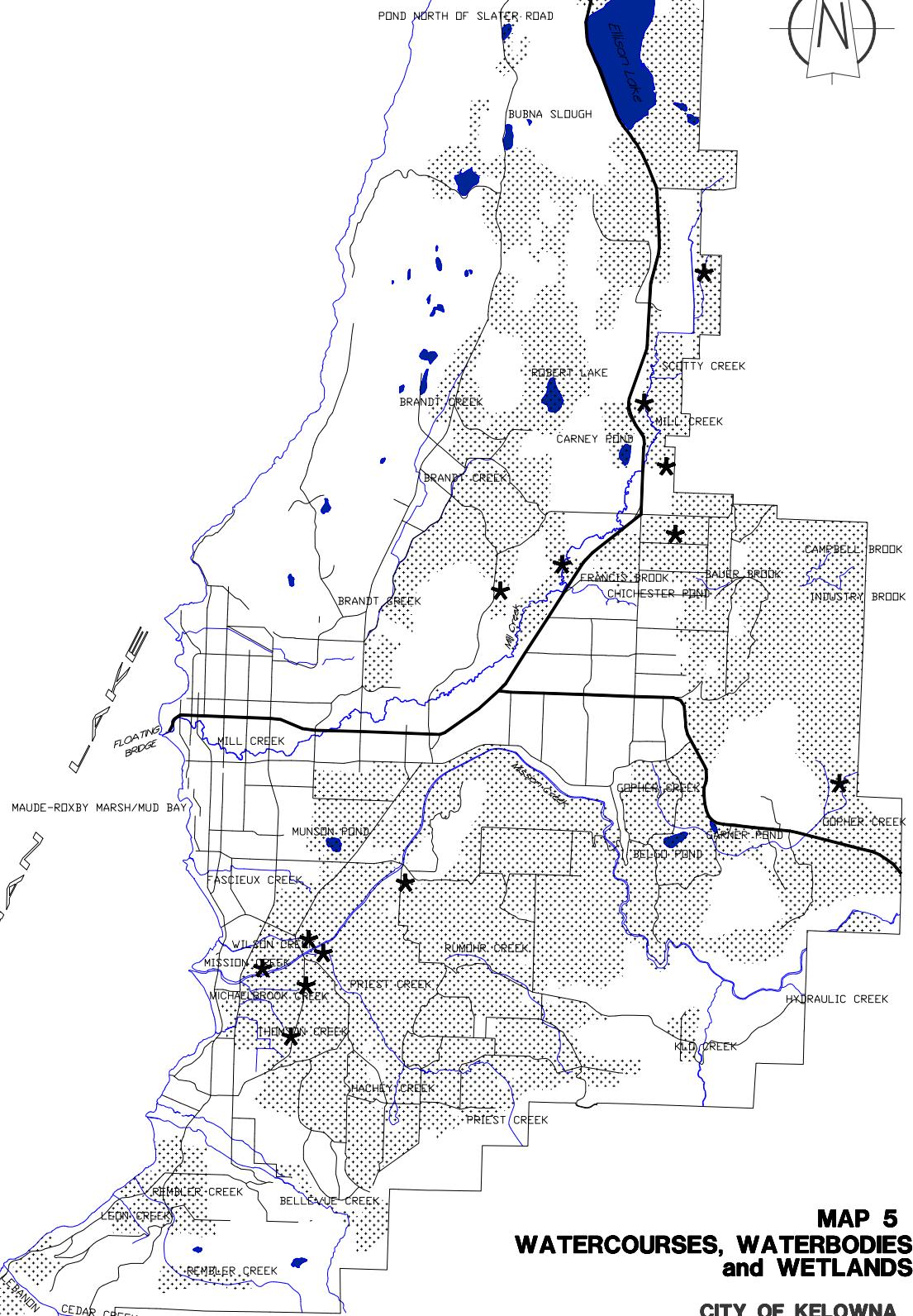
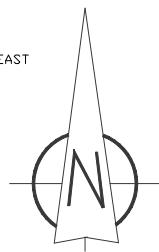
The B.C. Fruit Growers Association was formed in 1889 as a horticultural and market oriented organization. The BCFGA represents fruit growers, some 1000 growers, primarily in the Okanagan, Similkameen, and Creston Valleys.

The Okanagan Valley Tree Fruit Authority (OVTFA) was established in 1990 in response to growing financial concerns in the tree fruit industry. Their mandate is to facilitate the revitalization of the tree fruit industry and assist in the transition from government support programs to revenue stabilization programs, including the administration of the orchard replant program.

The B.C. Wine Institute was created in 1990 to promote the production, marketing, and sale of BC wines and grapes.



-  WATERCOURSES
-  WATERBODIES
-  WETLANDS within the ALR
-  ALR



MAP 5
**WATERCOURSES, WATERBODIES
and WETLANDS**

**CITY OF KELOWNA
AGRICULTURE PLAN**

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Heritage Sites

Many of the original Kelowna settlers were farming families who built the original homesteads and farm buildings that comprise an important part of the heritage resources in the community. These resources are outlined in the 1983 Heritage Inventory of the City of Kelowna. Although many of these buildings are now within the urban area of Kelowna there are still some sites within the rural areas comprising the Study Area.

Class "A"

- 2075 Belgo Road - Belgo House - 1912
- 2279 Benvoulin Road - Benvoulin Church - 1892
- 3685 Benvoulin Road - Pandosy Mission Historic Site - 1860's
- 3860/3877 Casorso Road - Farm buildings, south of Mission Creek - 1884 - 1907
- 2740 East Kelowna Road - K.L.O. House - 1908
- Gordon Drive - Pandosy Mission Graveyard - 1859

Class "B" and "C"

- 1280 Belgo Road - Gardner Res. - 1923 (C)
- 3139 Benvoulin Road - Tobacco barns - McFarlane - early 1900's (B)
- 3430 Benvoulin Road - Lequime Site - Brookdale - 1904 (B)
- 3443 Benvoulin Road - Rampone Ranch - pre 1900 (B)
- 2225 Burtch Road - Creighton barns - 1908 (C)
- 1749 Byrnes Road - Munson barns - c. 1900 (B)
- 1315 Crawford Road - Barn - 1934 (C)
- 2704 East Kelowna Road - Community Hall - 1938 (C)
- 2710 East Kelowna Road - St. Mary's Church - 1938 (B)
- Glenmore Road - Prouse Res. - 1911 (B)
- 4193 Gordon Drive (Paret Road) - Gifford Thomson Farm - 1922 (B)
- 1060 Guisachan Road - Dairy barn - 1890's (B)
- 2662 Longhill Road - 1920 - 25 (C)
- 840 Old Vernon Road - 1900 (B)
- 4500 and 4785 Parkridge Drive - Barns (B)
- 3430 Pooley Road - Bright House - c. 1908 (B)
- 3367 Reid Road - Reid House - 1911 (B)
- 1694 Rutland Road N. - Farm House - 1910 (C)
- 4230 Swamp Road - T. Murray Res. - 1928 (C)

An update of the 1983 Heritage Inventory, in the form of a Heritage Register, is under preparation in 1997. The new document may include previously un-inventoried sites.

Archeological Sites

There is an archeological site within the rural area of Kelowna indicated in the 1983 Heritage Inventory. This site is located near Hereron Road in northern Kelowna, west of the Ellison area. Another site in the McCulloch Road / Gallagher Canyon area of Southeast Kelowna, identified in the Inventory, has recently been excluded from the ALR.

CURRENT POLICY CONTEXT

Land Use Policy Considerations

Agricultural Land Commission Act

The Agricultural Land Commission Act was passed in the Legislature in the spring of 1973 with the mandate of preserving agricultural land as defined within the Agricultural Land Reserve, encouraging farming, and ensuring that land uses within the ALR are compatible with agriculture.

Decision making with respect to land use and subdivision within the ALR, as well as the extent of the ALR, are in the hands of the Provincial Agricultural Land Commission (ALC). As part of this mandate the ALC has adopted numerous orders, policies, and regulations to clarify the appeal process.

Significant Orders:	Bed and Breakfast Farm Retail Sales Home Occupations
Significant Policies:	Agri-tourist Accommodation ALR Boundary (subdivision along / outside, use outside) Dwellings for additional farm help Golf Courses Home Site Severance Parcels less than 2 acres Secondary Suites Wineries and Cideries
Significant Regulations:	Outright Uses Special Cases
Other Guidelines:	Landscape Buffer and Fencing Specifications

The Agricultural Land Commission Act was amended in 1994 by clarifying the role of the Land Commission in ensuring that local bylaws are consistent with the Act. Local community plans must now be referred to the ALC for review in a timely manner. The ALC Act has also been amended to allow the transfer of decisions concerning agricultural lands to local government where there is mutual agreement and supportive farming policies are in place.

Farm Practices Protection (Right to Farm) Act

This legislation, passed in April 1996, embodies farmers' rights to farm in the Agricultural Land Reserve, and in areas outside the ALR zoned for agriculture, provided the farm operation follows normal farm practices and legislation in the Waste Management Act, Pesticide Control Act, and Health Act.

A normal farm practice is defined in the Act as “a practice that is conducted by a farm business in a manner consistent with (a) proper and accepted customs and standards as established and followed by similar farm businesses under similar circumstances, and (b) any standards prescribed by the Lieutenant Governor in Council, and include a practice that makes use of innovative technology in a manner consistent with proper advanced farm management practices and with any standards prescribed under paragraph (b)”.

Some non-farm or farm residents may have concerns about the noise, dust, odour, or other farm disturbances that are generated by an operating farm. The Act provides for a complaint process. Poor farming practices are not protected under the Act.

The Act also made amendments to the Land Title Act [Section 86 (1)(c)] giving Approving Officers the right to evaluate a subdivision plan near, or adjacent to, agricultural land to determine if the subdivision would unreasonably interfere with the agricultural operation and to specify buffering, separation, or realignment of roads.

The Act also made changes to the Municipal Act giving municipalities authority to include policies to enhance or maintain farming, designate development permit areas to protect agriculture, develop standards to help prepare zoning and rural land use bylaws which support agriculture, and to review current zoning and rural land use bylaws to meet ministerial standards.

Soil Conservation Act

A Soil Conservation Act (SCA) was passed in support of the Agricultural Land Commission Act. The SCA prohibits the removal of soil from or the importation of fill to an ALR parcel without the approval of the ALC and the local authority, or as permitted by regulation. The SCA and Regulation does not prohibit removal of soil from one part of an ALR parcel to another part of the same ALR parcel, but the Regulation does permit removal or importation of limited amounts of soil for specified purposes.

City of Kelowna Strategic Plan - 1992

Objective 1.2 To reduce the use of agricultural land for urban development.

Objective 1.3 To reduce conflicts between urban and agricultural uses in the City.

Strategy 1.8 The City, in its future plans and policies will provide for the protection of productive agricultural land in the City.

Strategy 1.9 The City will, in the preparation of its Official Community Plan, provide for the establishment of buffer areas between agricultural and urban uses.

City of Kelowna Official Community Plan - 1995

Goals for Kelowna To preserve viable agricultural holdings as an integral part of our community.

<u>Community Setting</u>	Actively farmed agricultural land	- 27 %
	Non farmed ALR land	- 18 %
	Total ALR land	- 45 %

Economic Development

Tourism Policies:

Tourism in Agricultural Areas. Encourage an increased role of agricultural interests in tourism opportunities, initiated as part of an overall Agricultural Plan for Kelowna.

Sand and Gravel Policies:

Extraction Outside the ALR. Utilize gravel resources outside the ALR, whenever possible, prior to seeking sources within the ALR.

Extraction in ALR. Seek the cooperation of the Agricultural Land Commission with respect to allowing sand and gravel extraction where necessary on lands designated within the Agricultural Land Reserve.

Rehabilitation. Cooperate with the Ministry of Energy Mines and Petroleum Resources and the Agricultural Land Commission to ensure the rehabilitation of depleted sand and gravel extraction areas.

Redevelopment. Encourage identified gravel resources to be utilized prior to development these sites for urban uses to avoid the necessity of seeking such resources in ALR areas.

Agriculture

Agriculture Objectives:

Retain the agriculture industry as a major land use and economic force recognizing the community character, employment, environmental, heritage, and lifestyle values it contributes.

Improve the urban - rural relationship through effective management of adjacent land uses.

Provide an adequate level of roads and services to the agricultural area while minimizing conflicts through the sensitive placement and treatment of roads and utilities servicing development in and beyond agricultural areas.

Promote and support the long term economic viability of farm operations.

Encourage the long term availability of quality water with priority to agricultural users.

Agriculture Policies:

Sustained Agriculture. Encourage the retention of diverse agricultural uses through limits on urban development and non-farm use on lands of sustainable production capability.

Buffers. Provide for distinct boundaries that separate urban from rural uses by utilizing roads, topographic features, watercourses, ditching, fencing, or small lot rural transition areas, as buffers where appropriate, to preserve larger farm units and areas.

ALR Applications. Support, when Council deems it to be in the public interest, applications for ALR land exclusion and/or exemption: where lands are isolated by surrounding urban development; to promote orderly urban development and minimize urban rural conflict; or where clear municipal growth needs warrant such support.

Abandoned Orchards. Initiate the preparation of an abandoned orchard bylaw to reduce the pest impact on adjacent farm operations.

Service Corridors. Minimize the impact of penetration of road and utility corridors through agricultural lands, utilizing only those lands necessary and to the maximum capacity prior to seeking new corridors. Provision for farm traffic to cross major roads should be made.

Agriculture Education. Promote public awareness of and sensitivity to agricultural operations through agricultural signage programs.

Grower Support. Encourage local support for agriculture by promoting “buy local” campaigns and public education programs.

Specialization. Encourage the farming community to pursue crop specialization and value added products to increase farm viability.

Government Support. Encourage senior government to pursue supportive economic policies toward improving the financial viability of the agriculture industry.

Secondary Uses. Endeavour to obtain senior government support for limited secondary uses on farm land, such as limited processing, home occupations, agri-tourism, and other farm related uses, to promote the economic vitality of the agricultural community.

Taxation. Encourage senior government to pursue supportive taxation policies for agricultural industries.

Water Availability. Encourage decisions about water availability and quality to be made with the interests of the agricultural community as a priority.

Agriculture Plan. Prepare an Agriculture Plan toward enhancement of the industry and the City's role in decision making with respect to ALR matters.

New Development. Require that new development adjacent to agricultural areas provide sufficient buffering in the form of setbacks, fencing, and landscaping consistent with Provincial Agricultural Land Commission specification.

Leisure Services

Agricultural Land Reserve Policies:

Recreation in Agricultural Areas. Involve the local agricultural community in achieving expanded utilization of selected ALR lands for public recreation purposes.

Open Space Linkages. Negotiate necessary linkages for the linear park system that may cross ALR property.

ALR Applications. Prepare submissions to ALR to substantiate the need in special areas such as the Glenmore Valley, East Kelowna, Mission and Rutland for use of ALR land for recreation purposes.

Future Land Use

Rural / Agricultural Designation:

Land within the Agricultural Land Reserve and other rural farm and non-farm lands where natural physical constraints or lack of services and utilities limit land use intensification. Generally, land areas within this designation will not be supported for exclusion from the ALR or more intensive development than that allowed under current zoning regulations, except in specific circumstances where the City of Kelowna will pursue exclusion or exemption to satisfy civic objectives for the provision of industrial or park/recreation uses. Consideration of any amendments to increase the minimum parcel size of non-ALR lands zoned A-1 will be investigated as part of the proposed Agricultural Plan and the Zoning By-law Review.

Future Urban Reserve Designation:

Land that has some development potential but is not projected for development within the Official Community Plan 20 year time horizon. There is the potential for the reconsideration of the status of these lands as part of a future review and updating of the Official Community Plan. These boundaries are schematic in nature, and include lands which may remain within the ALR.

City Owned Property:

City owned property within the Agricultural Land Reserve.

20 Year Major Road Network:

The 20 Year Major Road Network requirements are directed primarily at achieving optimal utilization of existing facilities. These initiatives are more fully discussed in the Transportation section of the OCP. These staged network improvements and a land use

pattern, which concentrates development, seeks to preserve future road network options for reconsideration at such time as the OCP is reviewed and updated. Retention of the existing railway line as a potential future transportation / transit corridor is an important component of the Transportation Plan. Several of the road alignments which penetrate ALR lands are schematic only and will require approval by the Agricultural Land Commission. A longer term road network, beyond the 20 year time frame of this OCP, is part of the Transportation Study. Road links to existing neighbourhoods, through intervening lands, will be addressed when and if those lands are developed (e.g. Clifton / McKinley).

Implementing the Plan

Initiatives in Agriculture are to be advanced toward maintaining the agricultural industry as a viable and sustainable activity, and achieving a balance in land allocation for rural and urban purposes, including:

- investigation of the potential to increase the minimum parcel size on non - ALR A-1 zoned parcels;
- preparation of an Agricultural Plan for the City of Kelowna;
- preparation of refined development guidelines for improved buffer treatment between agricultural and urban land uses;
- pursual of release of essential parcels of ALR lands in order to ensure an appropriate land supply to accommodate the legitimate growth needs of the community.

Sector Plans

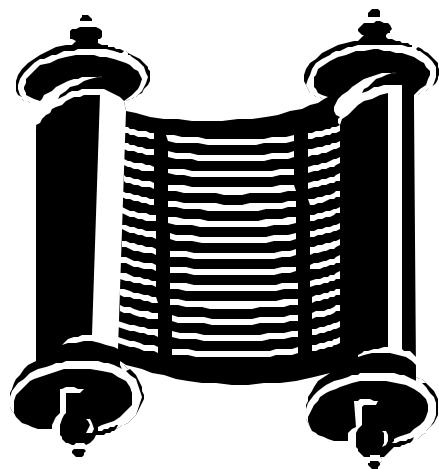
There are a number of existing and future Sector Plans within the City of Kelowna that have agricultural components and policies. The Agriculture Plan will consider the merits of these policies for inclusion as a city wide policy or serve as a vehicle to amend the various Sector Plans for consistency with the Agriculture Plan.

Sector Plans that have some implication on agricultural policy are as follows:

- Black Mountain Sector Plan
- Glenmore / Clifton / Dilworth Sector Plan
- Highway 97 North Sector Plan (pending)
- North Mission / Crawford Sector Plan
- Rutland Sector Plan
- South Pandosy / KLO Sector Plan
- Southeast Kelowna Sector Plan
- Southwest Mission Sector Plan

Zoning Bylaw

The new Zoning Bylaw No. 8000 (1998) has five zones that would typically apply to or within agricultural areas. Two zones (A1 and A2) are intended for general agricultural / rural uses, with the A2 zone also including intensive impact uses. Three zones (RR1, RR2, and RR3) are intended as rural residential zones with varying levels of permitted agricultural activity. **Map 6 – Current Agricultural Zoning** indicates the distribution of the above noted zones throughout Kelowna.



Agricultural Zones

A1 Agricultural 1 (Min. lot size 2.0 Ha.)

A2 Agricultural 2 (Min. lot size 8.0 Ha.)

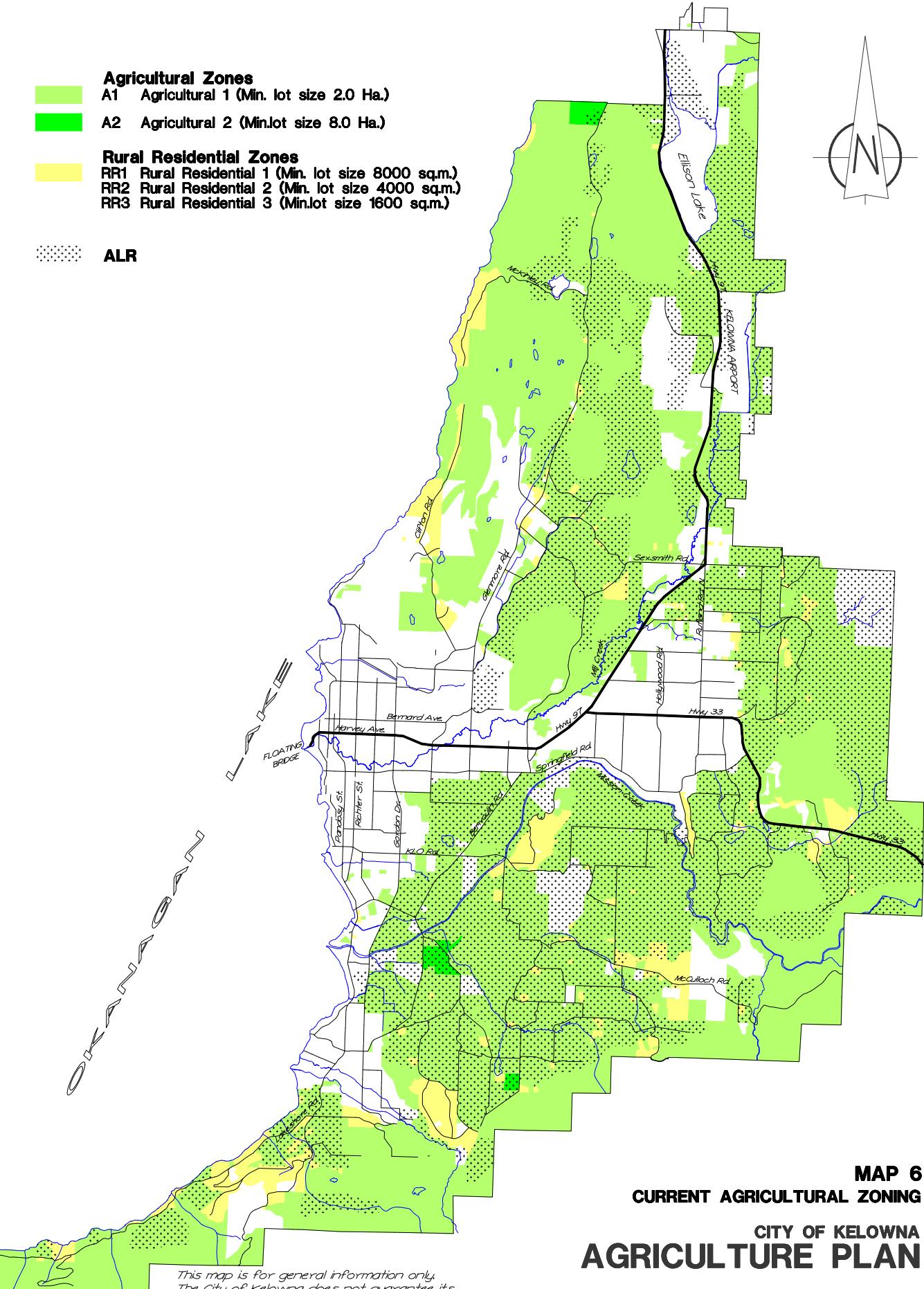
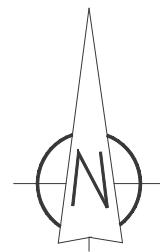
Rural Residential Zones

RR1 Rural Residential 1 (Min. lot size 8000 sq.m.)

RR2 Rural Residential 2 (Min. lot size 4000 sq.m.)

RR3 Rural Residential 3 (Min. lot size 1600 sq.m.)

ALR



MAP 6
CURRENT AGRICULTURAL ZONING
CITY OF KELOWNA
AGRICULTURE PLAN

REV. OCT. 27/98

This map is for general information only.
The City of Kelowna does not guarantee its
accuracy. All information should be verified.

ECONOMIC CONTEXT

Economic Impact

The Economic Development Commission (Impax Policy Services International report May 1997) estimates that the total Gross Domestic Product (GDP) for agriculture in the Central Okanagan at \$157 million, approximately 6 - 7 % of the total Regional GDP. This figure includes the processing and distribution industries, as well as other support industries.

Human Resources Centre of Canada (Kelowna) estimates that agriculture employment was on the order of about 2300 people in 1995, or approximately 4 % of the Regional employment total. This figure excludes the food and beverage industries.

Production Values

The value of agriculture to the City of Kelowna is partly documented by data collected by Statistics Canada, Census of Agriculture. Agricultural census information is collected every five years on a Census Area basis and the most recent data, released May 14, 1997, was collected during 1996. The data provides a snapshot of Agriculture in the City and surrounding area for the year 1995 since the census questions pertain to the year 1995. The City of Kelowna is located in Kelowna B.C. Agricultural Census area with a boundary the same as that of the Central Okanagan Regional District. This census area is divided into Central Okanagan Subdivision A occupying the east side of Okanagan Lake and Central Okanagan Subdivision B representing the west side of the lake. Further subdivision of the agricultural data was not available.

The data that is provided for Subdivision A (into which Kelowna falls) also includes the area of Lake Country, Ellison, and some of the ranching lands outside the City. The orchard operations of Lake Country are estimated to be not more than 15 % of the size of the orchard industry in the City of Kelowna. One winery and approximately 60 acres of vineyards are located in Lake Country, which also supports some vegetable production and two large greenhouse operations.

The type of farm included in both the following 1991 and 1996 census data is determined by the definition of a Census Farm. A Census Farm refers to a farm, ranch or other agricultural operation, which produces at least one of the following products intended for sale:

- crops: field crops, tree fruits or nuts, berries or grapes, vegetables, seed
- livestock: cattle, pigs, sheep, horses, game animals, other livestock
- poultry: hens, chickens, turkeys, chicks, game birds, other poultry
- animal products: milk or cream, eggs, wool, furs, meat
- other agricultural products: greenhouse or nursery products, Christmas trees, mushrooms, honey, maple syrup products

Neither the size of a farm nor the value of the sale of agricultural product is considered in the identity of a 1991 or 1996 Census Farm. The definition used in 1991 & 1996 is different from earlier Census years where the value of sales of agricultural products was taken into consideration. For both the 1981 and 1986 Census, for example, a census farm was defined as a farm or other agricultural holding with sales of agricultural products of \$250 or more, or anticipated sales of this amount in the previous 12 months. **Table 1** indicates the number of farms in Census Subdivision A by size of farm unit in 1991 and 1996.

**Table 1 - Number of Farms Classified by Total Farm Area
(Census Subdivision A)**

Size of Farm	1991	1996
Less than 3 acres	26	38
2 - 9 acres	154	166
10 - 20 acres	208	221
21 - 50 acres	122	102
51 - 70 acres	16	19
71 - 100 acres	11	18
101 - 130 acres	6	5
131 - 180 acres	8	8
181 - 240 acres	7	4
241 - 400 acres	8	7
401 acres and over	13	10
Total	581	598

The total farm acreage from 1991 to 1996 within Census Subdivision A increased from 36,731 to 52,007 acres, corresponding to an increase in the number of farms from 581 in 1991 to 598 in 1996. The following **Table 2** indicates the shift in acreage of farm land by selected type prevalent in the Central Okanagan. The increase in acreage is largely in cattle range, which is likely not located within the City of Kelowna. The decrease in tree fruit and other fruit (berries) acreage is partially offset by the increase in grape and vegetable acreage.

**Table 2 - Farm Acreage by Select Type
(Census Subdivision A)**

Farm Type	1991	1996
Grapes	1,439 acres	1,731 acres
Tree Fruits	9,061 acres	7,816 acres
Cattle	21,826 acres	34,997 acres
Fodder	1,090 acres	1,273 acres
Vegetables	253 acres	325 acres
Other Fruits (berries)	275 acres	95 acres
Other	2,787 acres	5,770 acres
Total	36,731 acres	52,007 acres

Farm income data is indicated in the 1991 and 1996 Census Tables in Appendix I. It must be remembered that farm income data is for the years 1990 and 1995 only and that intervening years data are not reflected in these tables. Each yearly total and average would be subject to market and weather conditions in that specific year.

While the total gross farm receipts appears to be high, it is offset by equally high expenses. In addition, the high number of farms filing tax returns includes hobby farms that derive a minimum income for tax purposes, which may skew the average farm income to appear lower than reality. However, the income may not support a farm family and some growers, or other family members, must supplement their income with off farm employment.

Support Agencies / Associations

The Okanagan Valley Tree Fruit Authority (OVTFA)

The Okanagan Valley Tree Fruit Authority (OVTFA) is a crown corporation established in 1990 by the Provincial government in response to growing financial concerns in the tree fruit industry. The ten year mandate of the OVTFA is to facilitate the revitalization of the tree fruit industry and assist in the transition from government support programs to revenue stabilization programs.

The most significant contribution to revitalization of the industry has been the orchard replant program administered by the OVTFA, which oversees the change to more profitable varieties and higher planting densities. Another major initiative has been the development of a digital atlas identifying suitable tree fruit lands from a climate and soil characteristic perspective.

The British Columbia Agriculture Council

The B.C. Agriculture Council is a new central farm organization representing the collective interests of B.C. producers. The Council was established in July 1997, with headquarters in Kelowna. Founding members of the Council include the B.C. Horticultural Coalition; B.C. Cattleman's Association; B.C. Milk Producers Association; Council of Marketing Boards of B.C.; B.C. Pork Producers Association and the F.A.R.M. Community Council.

The purposes of the Council are:

- to represent, promote, and advocate the collective interests of agricultural producers in B.C.;
- to assist in developing an economic environment that provides for strengthened competitiveness, long term growth, employment, and economic viability of the agriculture and food industry;
- to foster cooperation and a collective response to matters affecting the future of the industry; and
- to provide services to members that assist in achieving the purposes of the Council where appropriate.

The British Columbia Fruit Growers Association (BCFGA)

The B.C. Fruit Growers Association was formed in 1889 as a horticultural and market oriented organization. The BCFGA represents fruit growers, some 1000 growers, primarily in the Okanagan, Similkameen, and Creston Valleys. Recently the BCFGA has evolved into an organization that advocates growers' interests to all levels of government and the public. In addition to continuing to provide educational opportunities for its membership and the public, the BCFGA holds the shares in two industry companies (Sun-Rype Products Ltd. and the Plant Improvement Company Ltd.) in trust for the members. The BCFGA members have also participated in the Sterile Insect Release (SIR) program to eliminate codling moth infestation.

B. C. Wine Institute (BCWI)

The B.C. Wine Institute was created in 1990, with members appointed by the Lieutenant Governor in Council, representing major wineries, estate wineries, farm wineries, grape growers and the Ministry of Agriculture and Food.

The Institute mandate is to promote the production, marketing, and sale of BC wines and grapes in domestic and other markets, setting and regulating standards (VQA), improving viticulture practices, and representing grower and wine industry interests to government and other industries. The BCWI also represents the interests of registered grape growers in the Association of B.C. Grape Growers and the B.C. Grape Marketing Board.

The Interior Vegetable Marketing Agency Cooperative

The Interior Vegetable Marketing Agency (hereafter referred to as Agency) is a marketing board that controls the marketing of some vegetable crops to wholesalers and large retail stores. The Agency area extends from Hope to Alberta and from Quesnel south to the Canadian-American border. Vegetables whose sale is controlled include: greenhouse tomatoes and cucumbers, field grown tomatoes, cucumbers, peppers, green cabbage, red cabbage, onions (spring planted, silver skins, fall planted), rutabagas, carrots, parsnip, beets and cauliflower. Wholesalers and large retail stores generally do not buy vegetables whose sale is regulated directly from farmers unless the sales are authorized by the Agency. The Agency tries to provides its customers with a wide assortment of product by selling both regulated and non regulated product. Sales of regulated vegetables are permitted at the farm, or via "U-Pick" operations.

B.C. Cattleman's Association (BCCA)

The B.C. Cattlemen's Association, based in Kamloops, represents cattle producers from all areas of B.C. Although, the industry is concentrated in central and northern interior areas, primarily the Cariboo, Peace, and Thompson regions, there are 33 cattle ranches (1996 Census) encompassing some 35,000 acres on the east side of Okanagan Lake, within the Central Okanagan. Much of this land, although outside the City of Kelowna, still utilizes Kelowna as a service centre and provides cattle to local feedlots for finishing.

Central Okanagan Agricultural Awareness Society (COAAS)

The Central Okanagan Agricultural Awareness Society (COAAS) was registered as a society in 1994 to promote heightened public awareness of the value and the role of agriculture to the economic and social health of the Central Okanagan Region.

A grant from the Partners in Progress program enabled the Society to undertake a project to determine if support exists for the enhancement of agriculture activities through the establishment of a position of coordinator. The project was to assess current awareness initiatives in CORD and other jurisdictions, document the economic contribution of agriculture, and recommend options for an action and implementation plan. The results of that exercise indicate a preferred option of creating a full time coordinator position by seeking financial support from industry, individual farmer, member organizations, and government.

Support Industries

B.C. Tree Fruits (BCTF)

B.C. Tree Fruits is the official sales agency for the growers who form the BCFGA, and has been in existence since 1939, with resident sales agents in six major Canadian cities, along with sales agents and brokers who represent BCTF in other eastern Canadian cities, the United States, and overseas.

As many of the original grower families were immigrants from the United Kingdom and other countries in Europe there were strong ties to overseas markets that have been maintained. Apples make up 90 % of the total fruit marketed.

B.C. Fruit Packers

B.C. Fruit Packers Cooperative is a cooperative constituted under the Cooperative Association Act of B.C. and operated according to bylaws filed with the Registrar of Companies in August of 1984. The cooperative is a grower owned organization, which exists to provide the grower members with storage, packing, and marketing services. Storage facilities provide regular and controlled atmosphere storage.

Marketing is contracted to B.C. Tree Fruits, except local sales. Sun-Rype Products Ltd. contracts to take all process fruit available. Other membership services include horticultural advice, record keeping, deposit accounts, and advances.

Sun-Rype Products Ltd.

Sun-Rype Products Ltd. was formed in 1946 (original name B.C. Fruit Processors Ltd.) to process culled fruit into juice. Sun-Rype has become the largest juice manufacturers' marketer in Canada and pioneered the Tetra-brik packaging in North America. Introductions of juice blends, chilled juice, and other fruit products such as fruit bars, coffee bars, granola bars, and fruit to go snacks have expanded the ability of Sun-Rype to make use of local fruit. The Okanagan Falls food product plant has recently been relocated to Kelowna and Sun-Rype has also become a publicly traded company on the stock exchange.

Plant Improvement Company Ltd. (PICO)

The Plant Improvement Company was formed in 1993 to introduce, test, and develop new types of tree fruits. There are many combinations of fruit size, shape, colour, firmness, texture, and flavour, with each combination constituting a unique variety. PICO identifies those varieties with the greatest potential as information to growers, assists in selection and nurturing of new varieties, and provides information to customers and potential new markets.

Wineries

Of the 32 wineries in the Okanagan and Similkameen Valleys, there are 5 within the City of Kelowna, consisting of one major winery, 3 estate wineries, and one farm winery.

Recent changes (April 1, 1998) to regulations governing winery licensing have removed the limitations on the amount of wine that can be produced as well as restrictions on the source of the grapes or fruit. There is now a single category of winery license, with a minimum production level of 4,500 litres of wine per year.

Subsequent to the deregulation of the wine industry by the Liquor Control and Licensing Branch the Agricultural Land Commission adopted General Order #556/98 for Wineries and Cideries in the ALR. The previous limitation to use 50 % of on-farm grapes or other fruit has been broadened to include grapes or other fruit purchased from another B.C. grower by long term contract (minimum 3 years) within the 50 % on-farm produce, on the condition that the winery or cidery maintains a 2.02 ha. (5.0 acre) vineyard or orchard. Wineries may request an exemption from the ALC to bring in more grapes or fruit from off site in the event of weather related crop failure or replanting. The new General Order also permits "J" licensed winery lounges and tours or other promotional events ancillary to the winery or cidery operation.



AGRICULTURAL MANAGEMENT CONTEXT

Parcel Sizes

City of Kelowna Zoning Bylaw 4500, adopted by the City in 1976, established zoning regulations for the whole City, including areas amalgamated in 1973. All rural areas were zoned as Rural (A1), as a blanket zoning, with a minimum parcel size of 2 ha. (5 ac). This parcel size was established primarily as a continuation of the A1 Zone, 5 acre minimum requirement under Zoning Bylaw 3500, which preceded Bylaw 4500. Zoning Bylaw No. 8000 (1998) also contains the 2.0 ha minimum parcel size.

A discussion paper prepared for the Okanagan Valley Tree Fruit Authority (Tree Fruit Industry: Land and Water Use Issues - 1992) identified several land use issues that contribute to the reduction of the industry's viability. This paper indicates the average size of a commercial orchard as being 8.0 ha (20 acres). Smaller parcels produce correspondingly less fruit, while management costs do not similarly decrease. Higher land prices for smaller parcels create an interest on the part of the orchardists to sell portions of the orchard, and these smaller parcels are attractive to non-farm residents for country estate or rural residential uses. In addition, the higher land price per acre for smaller parcels makes the assembly of economic orchard units difficult and increases the speculation on the urban-rural fringe, which further exacerbates the problem.

Some current trends in agricultural management, and in particular supported by the OVTFA administered replant program, reflect a change to high density plantings with dwarf trees. Because the trees are smaller and can be planted closer together, there are considerably more trees per acre. Although each tree does not produce the same amount of fruit as a larger tree, the high density planting provides greater yields per acre. Theoretically, tree fruit parcels sizes could be reduced to create the same or greater yield achieved from past planting practices. In addition, smaller trees are significantly easier to spray, prune, and pick, providing cost savings from a management perspective. However, it remains to be seen if high density planting on smaller parcels will generate sufficient income to support farm families.

Another impact of smaller parcel sizes relates to the non-ALR rural land areas beyond the ALR on the periphery of the City. Additional development in these peripheral areas will have some impact on ALR lands and farming operations due to the need to access and provide services to development in outlying areas. Increased utility and road corridors, plus increased traffic on existing corridors will result, impacting the ability of farmers to operate.

Farm Families / Age

Further to the Census data reflecting that farm families are not being supported by the income derived from farming operations, discussions with farmers indicate that farmers and other family members often seek work off the farm to supplement their income. It has also been suggested that due to economic conditions younger family members or other interested persons are not attracted to the industry.

The cost of acquisition of farm land may outweigh the potential return in today's market conditions. Therefore, retiring farmers are not being followed into the industry by younger family members, and experience difficulty in selling land for farming. The value placed on the land by speculation as potential future development land far outweighs its value as productive agricultural land.

Fertilizers / Pesticides

Agricultural production is subject to potential impact from disease or insects that often require the application of fertilizers and/or pesticides. The use of such products may impact adjacent properties or environmentally sensitive areas.

The 1996-97 Tree Fruit Production Guide and the Grape Management Guide for Commercial Growers provides spray schedule examples. The spray schedules are only intended to provide a generalized reference to the types of sprays that may be used at various times of the year. Detailed consultations with crop experts are recommended before any spray is applied. Spray schedules change from time to time to reflect the kinds of insect or disease pressure that may occur.

Pest and weed control recommendations in British Columbia are developed by consultation with many experts including those in the BCMAF, Agriculture and Agri-Food Canada, producer and chemical company representatives. Recommendations consider the benefits of reduced use of pesticides; the effects of chemical control products on beneficial insects; the costs of the products suggested and toxicity of the pesticide. Pest control programs integrate the monitoring for pests to determine if control measures are needed.

Food and Drug regulations specify the weed or pest control products that may be used, the dosage of active ingredient and the acceptable maximum limits of residues in any food product. Provincial regulations require that users of dangerous pesticides obtain an applicators license. The last day that sprays to control pests or disease may be applied and intervals to harvest are specified for all pesticides in order to keep any residue level in food well below the accepted minimum levels.

Crop / Produce Management

Grape Production

Grapes have been produced in Kelowna since the early 1930s. The grapes currently produced in the Kelowna area are predominantly winery grapes for white wine because there is a greater selection of grape varieties for white wine and most red grape varieties for wine require more heat units than are usually available in Kelowna.

Management practices for grapes vary depending on slope, aspect, market (whether fresh or wine) and the grape variety. Grapes are heat loving crops that are sensitive to climatic and soil conditions. Minimum climatic requirements for grape production

generally include (1) a frost free season that is greater than 150 days; (2) sites that accumulate more than 945 growing degree days; (3) frequency of occurrence of -1 degree Celsius by October 10 is less than 50 percent; (4) the probability of having extreme minimum mid winter temperatures less than -25 degrees Celsius is 10 percent or less. Additional factors that influence the suitability of a site for grapes in the Kelowna area include: proximity to Okanagan Lake (warmer in the winter; cooler in summer); elevation (shorter growing season at lower elevations, and cooler at high elevations); aspect (warmer on south to south-west facing slopes).

Grape leaves begin to freeze at temperatures of -1 degree Celsius and the fruit does not continue to ripen after the leaves are frozen. However, the increased sugar content of frozen grapes has created a lucrative ‘ice wine’ market. Sites most suitable for grape production are usually located on slopes with good air drainage to reduce the risk of early fall / late spring frosts and to gain additional heat units during the growing season. Gentle slopes and slopes up to 30 degrees facing south to south-west are most suited; relatively flat areas with good sun exposure and good air drainage are also suitable.

Grapes are successfully grown on soil ranging from light to heavy textures, including very stony soils, provided irrigation is available. The use of appropriate grape rootstocks greatly expands the range of soil characteristics on which grapes can be grown successfully. Grapes grow best on soils which (1) are well drained (either naturally or artificially); (2) do not have a water table within 2 m of the surface; (3) have no restrictions to root development within the surface one metre; (4) are mineral soils; (5) have a soil pH between 6 and 7; (6) are not saline; and (7) have no to moderate levels of free carbonates in the surface one metre.

An Atlas of Suitable Grape Growing Locations in the Okanagan and Similkameen Valleys of British Columbia (hereafter referred to as “Grape Atlas”) was developed by staff of the British Columbia Ministry of Agriculture and Food; the British Columbia Ministry of Environment; and Agriculture Canada in 1984. The “Grape Atlas” is a guide which, at the scale of 1:50,000, identifies suitable grape growing areas based on individual climate themes (Solar Radiation; Growing Degree Days; Autumn Freeze Risk) and a combination of physical and chemical soil characteristics identified in 14 soil management groups. These individual themes have then been combined into one of 5 Grape Site Suitability Classes: Class 1 (most desirable and least restrictive for grape production) to Class 5 (generally unsuited for grape production). The Grape Atlas site suitability classes are indicated on **Map 7- Grape Suitability Atlas**.

Tree Fruit Production

Tree fruit production in the Kelowna area began when the first settlers arrived and has continued in the City ever since. The Okanagan Valley Tree Fruit Authority (OVTFA); BC Ministry of Agriculture, Fisheries and Food (MAF); Ministry of Environment, Lands and Parks; and Agriculture and Agri-Food Canada developed in 1995 Climate Suitability Maps for a selection of specific tree fruits (CSMTF) and Soil Suitability maps for a selection of hardy apple rootstocks and moderately hardy rootstocks for other fruit trees (some apple, cherry and pear) (SSMTF) for the Okanagan, Similkameen, and Creston valleys. These suitability maps are based on the frequency of occurrence of climate extremes that are injurious to trees or blossoms (winter, spring, autumn, freeze risk), growing degree days;

physical and chemical soil characteristics; and depth to water table. **Maps 8 and 9 - Overall Tree Fruit Suitability - Climate** and **Soil** indicate the general suitability for tree fruits. As these maps are very generalized, verification of all information for specific rootstocks or specific properties should be directed to the Ministry of Agriculture and Food.

Climate suitability maps are separate from soil suitability maps, and combined use of the two sets is required to determine the overall suitability of sites to selected tree fruit production. The most extensive set of maps deals with the climate suitability for specific apple varieties. A Climate Suitability map for Sour Cherries was not produced, however, sour cherries are very hardy and can be grown in similar areas as Spartan apples, Italian prunes, and plums. The maps are guides to the suitability of sites for specific tree fruits in a given area.

Based on the maps, there is substantially more area within the City that is suited to the production of prunes & plums, apples, pears, sweet and sour cherries and hardy apricots than there is for the production of hardy or tender peaches, and tender apricots. These latter crops are moderately suited to a unique climatic area in the Okanagan Mission that starts at approximately at Barnaby Road and extends westward along Lakeshore Road. This area is better suited to tender and hardy peaches and tender apricots than other areas because (1) winter temperatures that damage these trees occur less frequently; (2) the area is less prone to frosts at the time that peaches and apricots bloom; and (3) peaches and apricots are heat loving crops and require warm sites such as this area.

Kelowna is somewhat better suited to the production of sweet cherries than it is to the production of Golden Delicious apples. These apples are prone to russetting in this area with higher rainfall, compared to some other parts of the Okanagan.

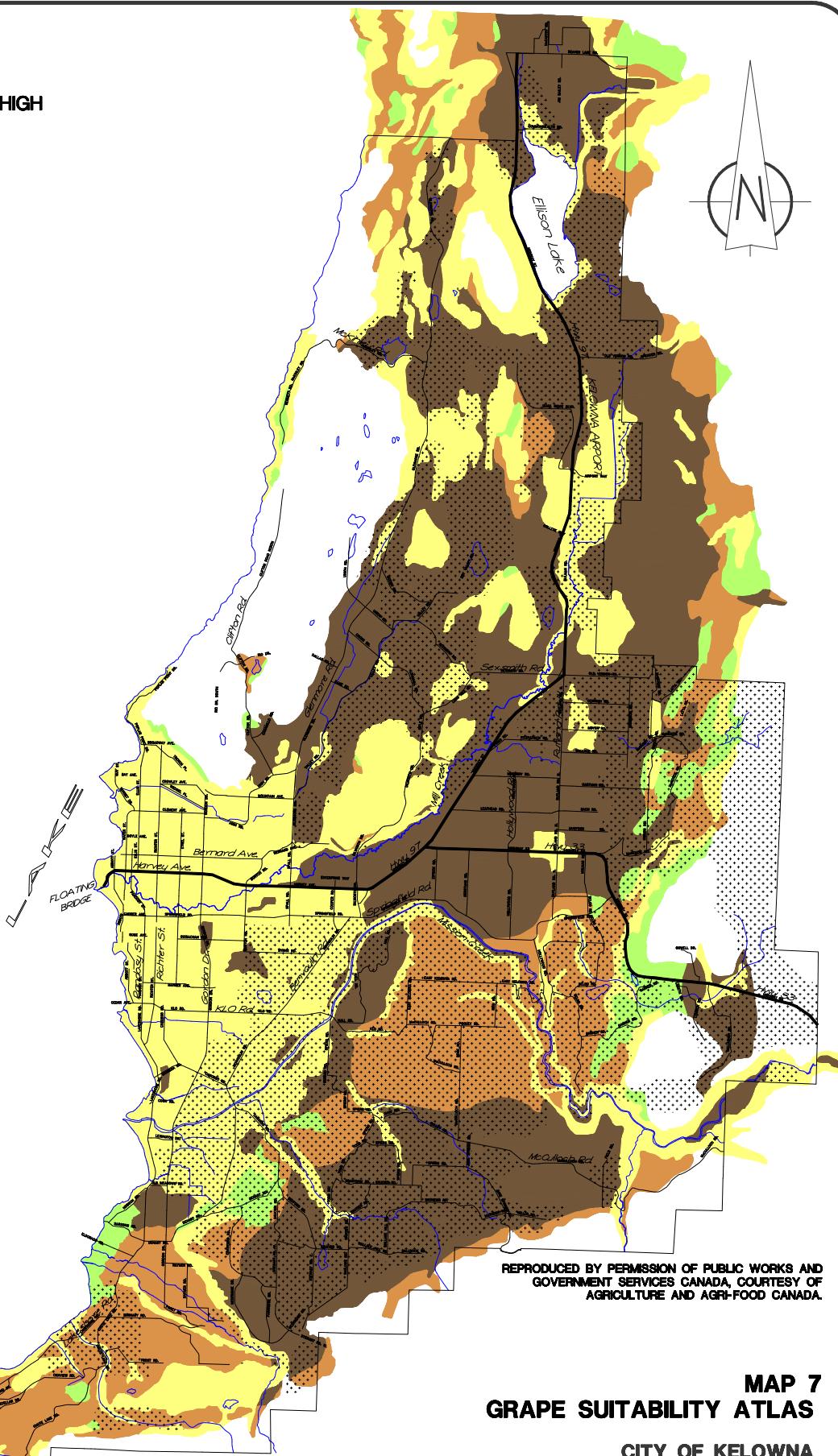
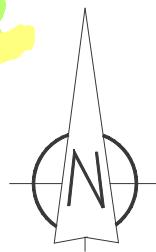
Small Fruits, Vegetables, and Other Production

The Okanagan Valley (including the Kelowna area) is widely known for the production of tree fruits and grapes. People may assume that if the land has low or poor suitability/capability for these crops then the land has little agricultural value. However, there is a wide range of other agricultural crops that are possible such as vegetables, small fruits, forages, etc.

Small Fruits

Strawberries and raspberries can be produced on all of the sites identified as high to moderate suitability for tree fruits or grapes. Strawberries and raspberries can also be produced on some of less poorly drained lands of the Benvoulin and Mission Flats and Rutland Flats, especially if under drainage is installed as needed.

 MODERATELY HIGH
 MODERATE
 LOW
 UNSUITED
 UNCLASSIFIED
 ALR



REPRODUCED BY PERMISSION OF PUBLIC WORKS AND
GOVERNMENT SERVICES CANADA, COURTESY OF
AGRICULTURE AND AGRI-FOOD CANADA.

MAP 7 GRAPE SUITABILITY ATLAS

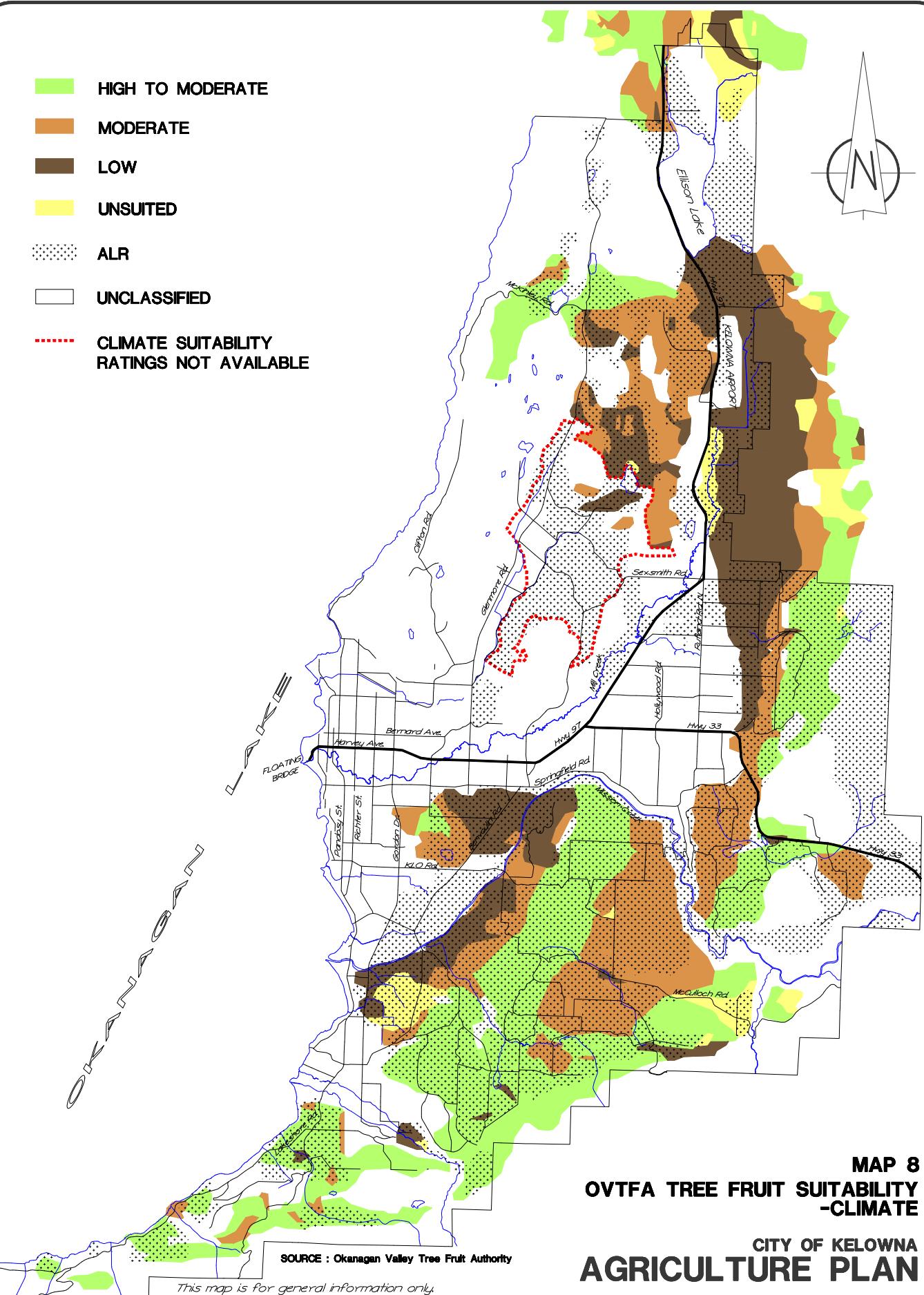
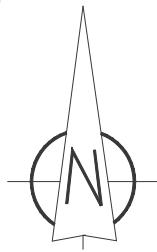
CITY OF KELOWNA AGRICULTURE PLAN

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The City of Kelowna does not guarantee its
accuracy. All information should be verified
with the Ministry of Agriculture, & Food

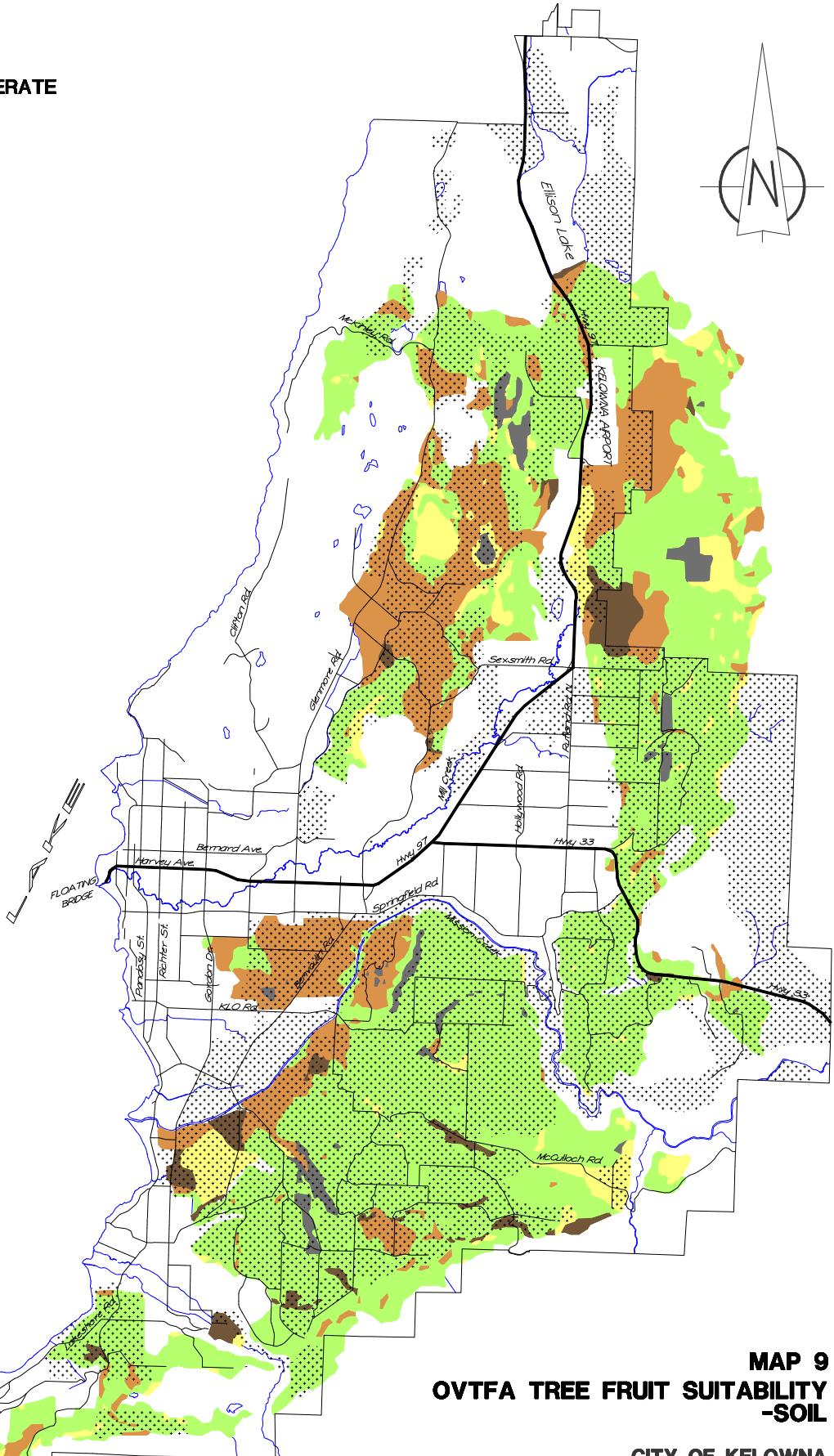
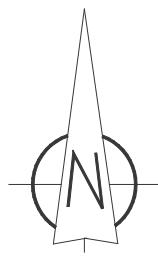
0 1000m 2000m 3000m

REV. FEB. 26/98

- █ HIGH TO MODERATE
- █ MODERATE
- █ LOW
- █ UNSUITED
- ALR
- UNCLASSIFIED
- CLIMATE SUITABILITY RATINGS NOT AVAILABLE



- █ HIGH TO MODERATE
- █ MODERATE
- █ LOW
- █ UNSUITED
- ALR
- UNCLASSIFIED



MAP 9
OVTFA TREE FRUIT SUITABILITY
-SOIL

CITY OF KELOWNA
AGRICULTURE PLAN

SOURCE : Okanagan Valley Tree Fruit Authority

This map is for general information only.
The City of Kelowna does not guarantee its
accuracy. All information should be verified
with the Ministry of Agriculture & Food.

0 1000m 2000m 3000m

REV. DEC. 12/97

A successful **highbush blueberry** planting currently exists on bench lands of the Rutland area. Horticultural specialists suggest that highbush blueberries can be grown in areas of high or moderate suitability for McIntosh apples or grapes and areas where strawberries and raspberries can be grown, provided soil acidity is adjusted (if required) and suitable varieties are selected.

Blackberries require mild winter temperatures. Okanagan winters can be expected to create crop losses in 2 out of 5 years in most Kelowna areas. Selected micro climates such as those in high rated grape growing areas or in areas suited for tender peaches and apricots may permit some commercial production.

Currants are hardy and may be grown in similar areas as apples, other tree fruits, grapes, strawberries, raspberries or blueberries.

Nuts such as filberts (hazelnuts) may be grown in various parts of Kelowna on a commercial basis and soil requirements are similar to those of grapes and tree fruits. Production of other nut crops such as various types of walnuts, heartnut and butternut is limited to similar areas as tender peaches and tender apricots.

Vegetable Crops

Vegetable crops can be grown in all areas of the City. They are successful over a range of climate conditions .

Onions require well-drained soils and long growing seasons. The growing season in the Kelowna area is generally sufficient in most years, but variations in the growing season and the risk of rainfall during harvest makes large scale production feasible only with improved storage and drying facilities.

Field grown peppers, a heat loving crop, are successfully grown on a range of textures of well-drained soils. **Greenhouse peppers**, for which there is a growing market, are not a regulated crop.

Certified Organic Crop Production

Certified organic production of grapes, tree fruits, other fruits, vegetables, flowers, niche crops, various types of livestock and exotic animals refers to production under strict Codes of Practice regulated by member organizations of the Certified Organic Associations of British Columbia (COABC). There are several organic producer organizations whose main offices are located in other parts of the Okanagan/Similkameen Valleys, but whose programs are available to anyone interested in participating in their organic production program. There is a growing demand for organically produced products. Organic production of various crops or livestock is usually more expensive than non-organic crops due to higher labour requirements.

'Niche' Crop Production

'Niche' crops and products are either traditional crops or alternatives to traditional crops targeted at a particular market. They are wide ranging and include products such as pre-cut and packaged salad mixes, pre-peeled and pre-cut packaged vegetables, frozen organic vegetables, baby vegetables, jams, jellies, salsa, preserves, dried flowers, various juices (apple, current, others), specialty items such as Oyster or Shiitake mushrooms, garlic and ethnic vegetables.

Included as niche crops are medicinal plants (over 130 different ones) such as ginseng; echinacea; sea buckthorn; yarrow; golden seal; St. John's wort (grows like a weed) and others, as well as mint (over 100 different types) and native plant material such as tall Oregon grape; horsetail; kinnikinnick; dandelion; rhubarb root and many others.

Forage and Hay Crops

Forage and hay such as grasses (i.e. timothy, brome) and alfalfa (shallow or deep rooted) can be produced in most agricultural areas of the City which are not unduly limited by high water tables. Production on slopes greater than 15 percent may require special harvest precautions.

Greenhouse Production

Greenhouses can produce 15 to 20 times more product per unit area than field grown crops. In addition to being used for tomato, cucumber and pepper production, greenhouses are also used for growing lettuce, radishes, other vegetable crops, and crops such as herbs and flowers including potted plants, foliage plants and bedding plants. Most commercial greenhouse operations are located in the Fraser Valley. A few are located in the City however, and expanded production of greenhouse tomatoes and cucumbers is feasible in co-operation with the Interior Vegetable Marketing Agency Co-operative. There is, as well, a growing market for locally produced greenhouse crops including peppers, house plants and garden plants. Greenhouse production is dependent on the availability of three-phase power and natural gas or another source of heat.

Mushroom Production

Mushroom production in British Columbia is regulated by the B.C. Mushroom Marketing Board. The Board regulates the production and sale of the traditionally cultivated button mushrooms. A license from the Marketing Board is needed to produce and sell mushrooms. Levies are paid on volume of product that is sold. Mushrooms are currently produced commercially outside the Lower Fraser Valley by three mushroom producers, one of whom is located in the City of Kelowna. Specialty mushrooms, such as Oyster and Shiitake, are also regulated by the Board.

Compost for mushroom production may be purchased from specialized producers in the Lower Fraser Valley. This removes the requirement to produce compost on site and the odour concerns that may accompany mushroom compost production. Spawn is a mixture of mushroom spores and cereal used to inoculate mushroom compost for mushroom production. It has no odour and could be produced on site, or could be

purchased from specialty producers. Spent mushroom compost is sold for use as a soil conditioner.

Nursery Crop Production

Nursery crops may be grown in fields or in pots placed on fields, or in combinations of field and pots, and greenhouses and hoop houses. In-ground nursery crops generally tolerate a wide selection of soil textures and slopes and are suited for a wide range of locations.

The nursery crop industry is comprised of retail and wholesale producers, plant material distributors and brokering and landscape nurseries which produce many different types of crops. Three phase power and natural gas is required by nurseries that use greenhouses. There is a growing interest in native plant material referred to as native botanicals for use in landscaping and for medicinal purposes.

Livestock Production

Kelowna area supports a small beef industry. Beef production by ranches in Kelowna are primarily cow/calf operations that use native range outside the city. These ranches ship calves to feedlots for finishing and processing. A small beef processing facility exists in the City.

A reasonably sized beef operation requires at least 100 to 150 cows plus sufficient land to produce 1.8 tonnes of hay/cow/year. A 100 cow herd would therefore require about 20 hectares of crop land to produce the hay required for feed (at 9 tonnes/ha) plus additional land for grazing. Some producers have feedlots as seasonal feeding or over wintering areas on the operating ranch within the City and use native range forage lands outside the City during the non-winter months. Some beef producers import beef for finishing in a feedlot.

At least one substantial feedlot operates in the City throughout the year and imports, or purchases locally, animals for finishing. There are no commercial **dairy** operations within the City at the present time. Land and milk quota costs are limiting factors for the establishment of a dairy.

Very few **hogs** are produced within the city at the present time. Modern hog facilities using deep litter as bedding produces very little odour. Disposal of animal waste and proximity to urban residents needs to be considered in any farm animal operation.

Poultry includes chickens for meat or eggs; turkeys; ducks; geese; squab; quail; silkie chickens; and pheasants. Chicken, turkey, and egg production is regulated by marketing boards, which set quotas that regulates production. The other "birds" are not regulated. There are several commercial egg and broiler operations in the City.

Honey Bees produce honey, bee pollen and bee wax, and are essential for tree fruit crop pollination. Honey bees are over wintered in the City and transported to other areas when they are needed.

Game Farming consists of the agricultural production of fallow deer, bison and reindeer. It is an activity not presently located in the City, but could be in the future as this is a legitimate farm operation. There are areas in the City suitable for this type of farm business, some outside the ALR.

Exotic Animals such as llama and alpaca, musk ox, ostrich, emu, rhea and tinamou are included in the term "farm animals" under the Farm Practices Protection (Right to Farm) Act as exotic animals. Production of these animals qualifies under the definition of "farm operation." There are lands within the City that are suitable for the production of these animals and at least one small operation for llamas and alpacas exists.

Aquaculture is regulated by the provincial government and a license is required to become a commercial aquaculture operation. There are no aquaculture operations within the City at present. Potential future operations could take the form of commercial fish or aquatic plant production, or fish farms with fee fishing for tourists.



LAND CONTEXT

Zoning

Agricultural zoning, as indicated on **Map 6 - Current Agricultural Zoning**, is largely A1 Rural zoning, with some A2, A3, A4 Rural Residential zoning, and other zones for Park, Residential Golf Resort, or other major civic or institutional uses. The A1 Zone allows general agricultural uses however, it should be recognized that not all land in this zone is actively used for agricultural purposes.

Existing Land Use

The predominant land uses outside of the urban areas of the City are agriculture, large rural land holdings, or small lot rural residential uses. There are also a number of specialized civic, institutional, utility, or private recreational uses such as airport, landfill, parks, schools, irrigation facilities, power and gas substations / lines, golf courses and golf driving ranges.

Farm Classification

The B. C. Assessment Authority (BCAA) classifies land and improvements under an actual use classification system. There are a number of codes that apply to the types of farming activity. In order to qualify for farm status for city property tax purposes there is a minimum of \$2,500 annual income that must be derived from a farm property. **Map 10 - B.C. Assessment Authority Farm Classification** indicates the approximate location of the various types of farm activities in the City. It should be noted that this information is based on the most current BCAA data available. **Table 3** indicates the percentage of land area within each type of farm classification.

Table 3 – BCAA Farm Classification Types by Percent of Land Area

Farm Type	Grain and Forage	Veg. and Truck	Tree Fruits	Small Fruits	Bee f	Dairy	Poultry	Mixed	Other
%	10	1	37	2	34	0.5	0.5	6.5	8.5

Agricultural Land Reserve

Approximately 42 % (8,927 ha / 22,059 acres) of the City of Kelowna land area is within the Agricultural Land Reserve (ALR). **Map 2 - Agricultural Land Reserve** indicates the extent of ALR within the City. It should be recognized that approximately 30 % of the land in the A1 Zone is not in the ALR and that there are actively farmed lands that are not included in the ALR.

Under current legislation, any parcel less than .8 ha (2 acres), by a separate certificate of title on Dec. 21, 1972, is not subject to the land use restrictions of the ALC Act. There is also a general order, which currently provides partial exemption to parcels created less than .8 ha. (2 acres) since Dec. 21, 1972. ALC approval would still be required for exclusion or subdivision of parcels less than .8 ha.

Agricultural Capability / Soil Capability

An Agricultural Land Capability Review and Cropping Options Study (H.A. Luttmerding / John Vielvoye, July 1997) prepared for the City of Kelowna, outlines general background, agricultural land capability, and suitability for various crops, as noted below.

The Agricultural Land Reserve was established in the Kelowna area in the early 1970's based on map information from the Canada Land Inventory's Soil Capability for Agriculture program. **Map 11 – Soil Capability for Agriculture** is a digitized version of the CLI mapping. This program classified all of Canada's current and potential agricultural land into seven classes based on the range of crops possible. Class 1 has essentially no limitations for the production of regionally suited crops while Class 7 land has little or no value for agriculture. This relatively broad-scale mapping (1: 125 000 scale in the case of the Central Okanagan) provides a moderately detailed agricultural capability overview of the City's ALR lands. Class 1 to 4 lands are generally included in the ALR. Included in the ALR at that time were some areas considered as, 'environmentally sensitive', e.g. steep slopes, and as green space even though their agricultural capability was low. These initial ratings have, in some cases, been periodically revised by detailed, parcel-sized assessments resulting in the modification of the City's ALR boundary to reflect this more detailed information.

In the mid-1980's, subsequent to the Canada Land Inventory and designation of the ALR, a more definitive agricultural land capability classification for British Columbia was developed and applied to the lands of the Okanagan. This 'new' classification system, entitled 'Land Capability Classification for Agriculture in British Columbia', B.C. Land Inventory; MOE Manual 1, 1983, considers the relative intensity of soil conservation and management practices required, in addition to the range of crops concept. Additionally, the classification system contains a 'tree fruit modification' which reflects that tree fruit (and grape) crops generally are less limited by stoniness and topographic conditions than most other agricultural crops. This newer classification system is more definitive and specific and therefore not directly comparable to the earlier CLI classification although both have seven classes.

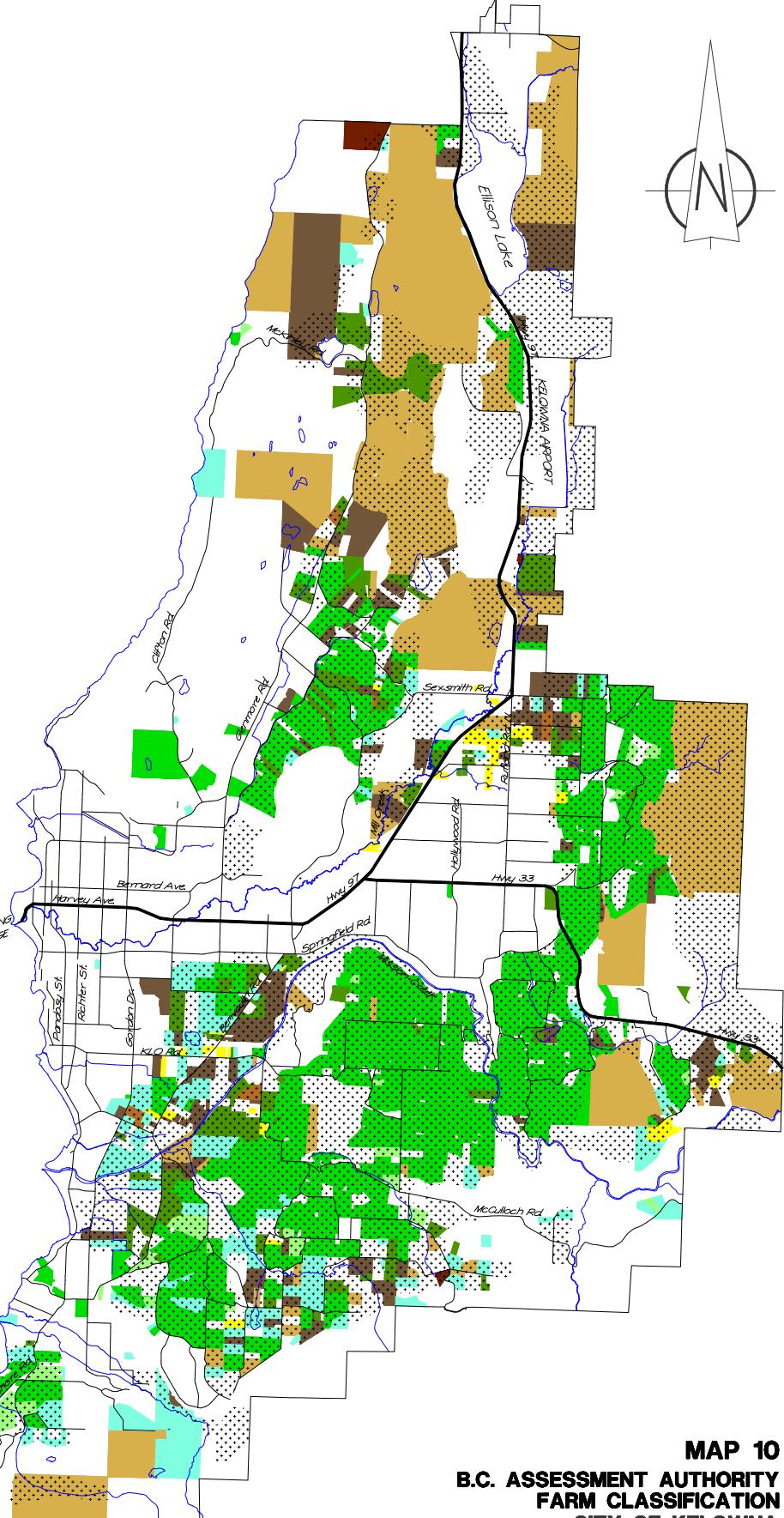
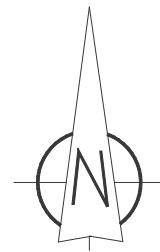
Comparison of the land capability ratings generated by the CLI methodology and the more detailed methodology of the BC Land Inventory (BCLI) indicates that they are similar for the City lands in the ALR (i.e. the CLI rating may sometimes be Class 2 while the BCLI rating is Class 3, or vice versa). These relatively minor discrepancies are due to the more detailed scale of the BCLI maps and the differences in the methodologies of the two systems. There are no locations, however, where one rating system indicates high agricultural capability while the other suggests low capability.

A field and office review of the City's ALR and the associated soil capabilities for agriculture confirms that the boundaries of the ALR lands, in most cases, rather precisely define lands with high to moderate agricultural capability. The soil capabilities for agriculture for City lands in the ALR are essentially all those with ratings of Classes 1 to 4 under improved conditions (i.e. mainly soil drainage or irrigation). These are generally considered as lands with high to moderate value for agriculture. Included are some areas with steep slopes that have little agricultural production value, but

LEGEND

- Grain & Forage
- Vegetable & Truck
- Tree Fruits
- Small Fruits
- Beef
- Dairy
- Poultry
- Mixed
- Other

(dotted) - Agricultural Land Reserve



SOURCE : B.C. ASSESSMENT AUTHORITY

This map is for general information only.
The City of Kelowna does not guarantee its
accuracy. All information should be verified.

MAP 10
B.C. ASSESSMENT AUTHORITY
FARM CLASSIFICATION
CITY OF KELOWNA
AGRICULTURE PLAN

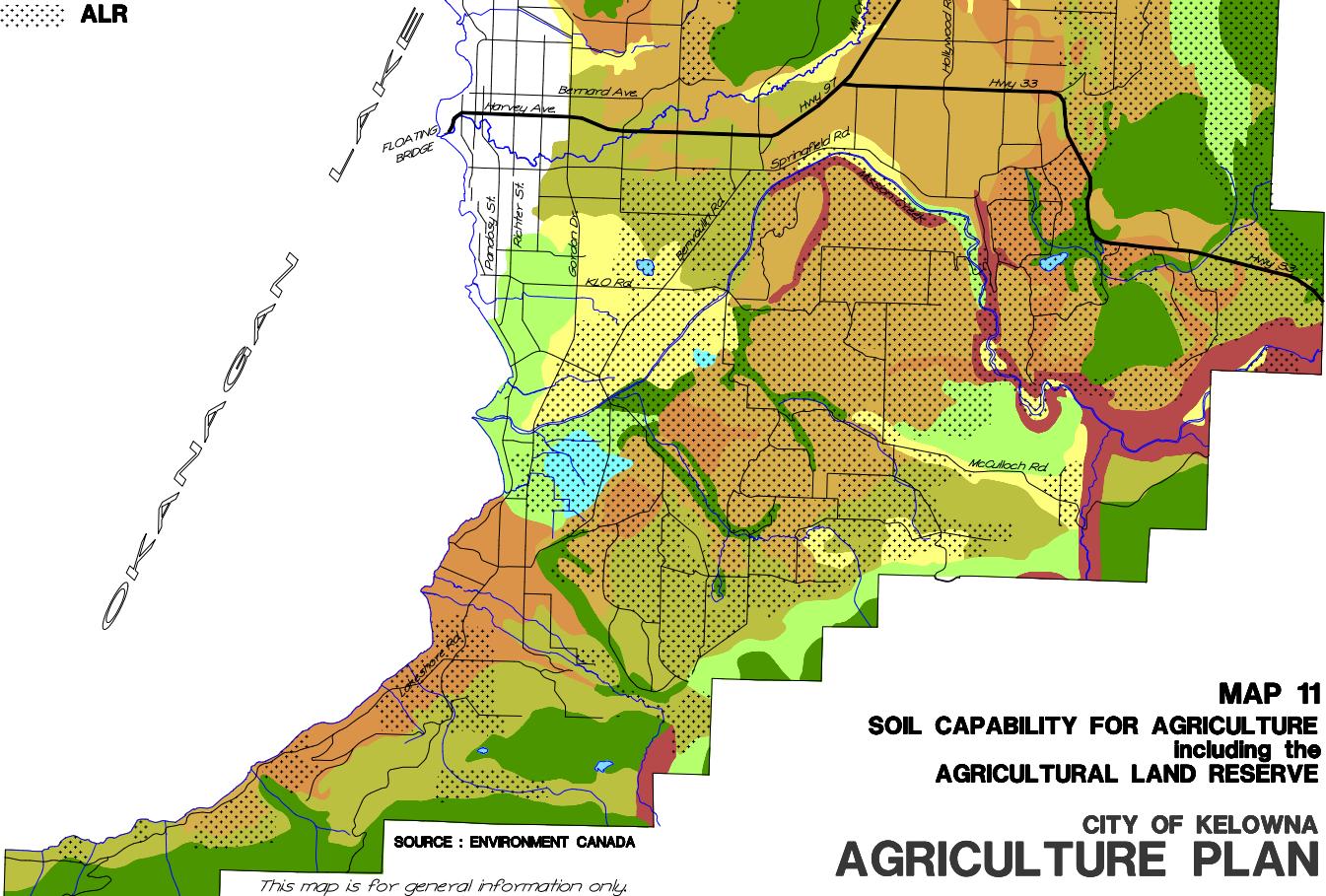
0 1000m 2000m 3000m

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CLASS

- 1 SOILS HAVE NO SIGNIFICANT LIMITATIONS IN USE FOR CROPS**
- 2 SOILS HAVE MODERATE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE MODERATE CONSERVATION PRACTICES**
- 3 SOILS HAVE MODERATELY SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL CONSERVATION PRACTICES**
- 4 SOILS HAVE SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL CONSERVATION PRACTICES, OR BOTH**
- 5 SOILS HAVE VERY SEVERE LIMITATIONS THAT RESTRICT THEIR CAPABILITY TO PRODUCING PERENNIAL FORAGE CROPS, AND IMPROVEMENT PRACTICES ARE FEASIBLE**
- 6 SOILS ARE CAPABLE ONLY OF PRODUCING PERENNIAL FORAGE CROPS, AND IMPROVEMENT PRACTICES ARE NOT FEASIBLE**
- 7 SOILS HAVE NO CAPABILITY FOR ARABLE CULTURE OR PERMANENT PASTURE**
- 0 ORGANIC SOILS (not placed in capability classes)**

ALR



MAP 11
SOIL CAPABILITY FOR AGRICULTURE
including the
AGRICULTURAL LAND RESERVE

CITY OF KELOWNA
AGRICULTURE PLAN

0 1000m 2000m 3000m

REV. DEC. 12/97

This map is for general information only.
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accuracy. All information should be verified.

provide environmental protection to adjacent agricultural areas. Similarly, several golf courses and a nature preserve are also included in the ALR.

The soil capability for agriculture ratings (both those from the CLI and later more detailed BCLI maps) assume that irrigation is available as required for all lands and that lands with restricted natural drainage are artificially drained to achieve cropping potential. These assumptions are reflected in the published improved capability ratings.

The summer-dry Okanagan climate including the Kelowna area means that adequate supplemental irrigation is critical for commercial agricultural production in the City of Kelowna. Without irrigation, commercial agriculture would not be possible.

Poor land drainage inhibits some areas of the City from achieving their agricultural potential. The main areas are the Mission-Benvoulin Flats and the area north of Reid's Corner in the vicinity of Mill Creek. Smaller, scattered areas occur elsewhere as well, for example along Valley Road and around Roberts Lake. The organic soil area near Swamp Road is another area of particular drainage conditions.

Agricultural Capability Sub-Area Details

1) Quail Ridge - Dry Valley Area:

This ALR area lying generally west of the Kelowna Airport includes substantial land that is currently agriculturally undeveloped. The soils, which are mostly sandy with moderate slopes, are similar to those in other parts of the ALR in Kelowna. They have agricultural capabilities of mostly Class 3 and Class 2. Ongoing slight to moderate limitations result from topographic conditions and/or expertise required for irrigation management. The mostly undeveloped nature of the area should not be mistaken for poor agricultural capability. Increased availability of water would enhance the production capability of lands to the north of Lochrem Road.

2) The Glenmore Valley:

The portion of the valley in the ALR consists mainly of well to moderately drained clayey soils with gentle to moderate slopes. Some sandy and gravelly areas occur as well, mainly along the valley margins. Land capability for agriculture is dominantly Class 3 limited mainly by the dense, clayey nature of the subsoils and the irrigation expertise needed for adequate management. The lower slopes of the valley are considered by some to be limited for tree fruits and grapes due to potential for frost during blossoming, early fall frost and low winter temperatures. A wide variety of other crops, both annual and perennial, are suited however.

A small triangular portion of the ALR in the vicinity of Dilworth Drive - Rifle Road has soils and agricultural capabilities similar to other parts of the Glenmore area. The small parcel sizes and the proximity of urban development on both the east and west may hinder on-going agricultural development and use. As well, a portion requires improved soil drainage.

Robert Lake has no natural discharge channel and the margins of the lake flood depending on the amount of water inflow from snow melt and rainfall. Although flooding would be controlled by development of an adequate outlet, the agricultural capability of the affected lands would still be severely curtailed by the strongly saline soil conditions that exist.

The lands in the vicinity of Valley Road and Cross/Longhill Roads consist of a relatively small area of poorly drained soils, with the water table partially controlled by municipal ditches. Even with adequate drainage, soil capability is still substantially curtailed (i.e. Class 4) by saline soil conditions.

3) Valley Bottom from the Vicinity of Old Vernon Road North to Duck Lake:

This area of the ALR consists of well to moderately drained, sandy to clayey soils with gentle slopes, except for a poorly drained portion between Scotty Creek and Edwards Road. The area is generally considered to be poorly suited for tree fruits and grapes due to the likelihood of frost during blossom time in the spring, early fall frost and low winter temperatures. A wide variety of other crops, both annual and perennial, are capable of production in this area. Improved land capabilities for agriculture are dominantly Class 3 or Class 2. Ongoing slight to moderate limitations vary through the area ranging from dense, clayey subsoils, to ongoing minor water table impediments.

The poorly drained area occurs at least in part, due to flooding from Mill Creek. Alleviation of the drainage problem may require deepening and widening of the creek or provision of dyking, a potentially contentious issue due to the modification of a natural drainage way. Downstream flooding may also occur due to periodic high flows.

4) The East Rutland Benches:

This ALR area lies east of the urbanized portions of Rutland and basically consists of two portions. The western part (i.e. that part which is currently agriculturally developed and serviced by irrigation) has soils that consist of mainly sandy and loamy, undulating and rolling, or moderately sloping soils. Agricultural capabilities are high, mostly Class 2 or 1 with lesser amounts of Class 3.

The eastern portion extending to the eastern City boundary and including the valley between Black Knight and Iron Mountains is currently undeveloped and used mostly for native grazing due to irrigation not being available. Soil characteristics and agricultural capabilities of these lands are generally similar to the developed portions to the west (i.e. sandy to loamy, undulating to moderately sloping soils with agricultural capabilities mostly ranging from Class 3 to Class 1, if irrigated). Portions of the land adjacent to the eastern City boundary have lower capabilities due to increasingly steep topography and shallowness to bedrock.

5) Belgo, Garner, Lynrick, Gallagher Road Areas:

This ALR area south of Highway 33 consists of mainly sandy and loamy, undulating and rolling, or moderately sloping soils. Agricultural capabilities are high, mostly Class 2 or 1 with lesser amounts of Class 3. Minor ongoing limitations relating to irrigation expertise are present; as well, in some locations adverse topography is a limiting factor.

6) Benvoulin - Mission Flats Area:

This lowland occupies a large portion of the City's ALR. The soils consist mainly of moderately poorly to very poorly drained sandy and silty fluvial deposits. A very poorly drained organic area also occurs in the vicinity of Swamp Road. High water tables and poor drainage are the main agricultural capability limitations. When adequately drained, however, land capabilities of Class 2 or Class 3 are possible. Grapes and some tree fruits are limited by potential spring frosts during blossoming and early fall frosts, however, a wide variety of other annual and perennial crops are possible.

This area is the largest in the City with soil drainage impediments. Poor soil drainage is most limiting during the spring and early summer periods due to snow melt and high levels in Okanagan Lake and Mission Creek. Seepage from the bench lands also contributes to poor drainage on the adjacent lowlands.

The main areas of very poorly drained soils are located near Mission Creek and south of the creek, including an area of organic soils adjacent to, and west of Swamp Road. During parts of the summer irrigation is required on the affected lands as well.

The detailed (BCLI) land capability for agriculture maps identify the area north of Mission Creek as mostly Class 4W with some Class 5W, when unimproved (i.e. un-drained). The capability, when adequately drained increases to mostly Class 2W with some 3W.

The unimproved capability of the mineral soils on the Flats south of Mission Creek is mainly Class 5W with some 4W; this increases to mainly Class 3W and some 2W when adequate drainage is present. The capability of the organic area increases from 04W or 05W, un-drained, to mostly 02W with adequate drainage.

7) Southeast Kelowna Area:

The ALR lands in this rather large area of the City consist mostly of rolling to terraced, sandy and gravelly, well and rapidly drained soils. An area of clayey and silty soils also occurs. The dominant improved land capability for agriculture, based on the BCLI methodology, is Class 3, interspersed with lesser amounts of Class 2 and some Class 1.

The ongoing limitations reflect the extra expertise required to manage irrigation on these coarse textured soils, as well as topographic limitations and stoniness in some locations. Slopes to about 15% are generally considered to be suitable for the production of most crops (i.e. those requiring at least one cultivation during the year). Slopes up to between 25 and 30% are generally acceptable for tree fruits and grapes since these crops do not usually require annual cultivation. The clayey soil areas have ongoing limitations relating mainly to rooting depth and management expertise required for these dense soils.

Some land scattered through Southeast Kelowna is currently undeveloped for agriculture (e.g. that located near the intersection of Dehart and Crawford Roads). These lands are generally undeveloped not because of low agricultural capability but for other reasons such as lack of irrigation water.

8) Southwest Mission Area:

The rather limited ALR land in this portion of the City is similar in soil characteristics and agricultural capability as the Southeast Kelowna area (i.e. mostly Class 3 with inclusions of Class 2 and 1). Comments previously provided for the Southeast Kelowna Area apply here as well.

Soil Suitability

Grape Production

Areas with Class 1 grape site suitability do not occur within the City boundaries. The best site suitability rating for grapes in the City is Class 2 in limited areas, followed by more widespread Class 3. Classes 4 and 5 dominate in a large portion of the city. Areas rated Class 2 or 3 site suitability are preferred for grape production. A fairly wide selection of fresh market (table grapes) and wine grapes can be grown in areas with a Class 2 rating, while a somewhat reduced selection of varieties can be grown on sites with a Class 3 rating. These sites generally have climatic conditions that are better than the minimum climatic requirements needed or have a reduced risk of occurrence of one or more of the minimum climatic requirements. Areas with Class 4 site suitability are generally unsuited to grape production except under special circumstances depending on the site, the grape variety chosen, and management skills of the operator.

Map 7 is a digitized version of the original site suitability data from the Grape Atlas and indicates the general suitability of lands throughout Kelowna for the production of grapes.

Tree Fruit Production

The area of the City with soils that are suitable for tree fruit production is relatively large. Soils most highly suited for hardy apple rootstocks are those that are sandy to silty in texture, free from water to at least 100 cm, have slopes of 20% or less, are non-saline, and contain less than 50 % coarse fragments. Soils moderately suited for hardy rootstocks have slopes of 20 to 30 %, 50 to 75 % coarse fragments, have water tables below at least 50 cm, are slightly to moderately saline or have textures that are either very sandy or high in clay.

Most tree fruits in Kelowna are grown on moderately coarse to medium textured soils. These soils are generally moderately to highly suited for a variety of tree fruits depending on the type of fruit grown on a particular site. Pears are better suited to areas with fluctuating water tables than are apples or sweet cherries. The suitability for Bartlett pears may be higher than indicated on some maps and may be equivalent to Anjou since Bartlett pears bloom at approximately the same time, are used as pollinators for Anjou pears, and are grown on the same rootstock.

Small Fruits, Vegetables and Other Production

A variety of small fruits and vegetables are examples of the diversity of farm production possible on most of Kelowna's agricultural lands. General crop requirements include well to moderately well drained soils with pH values between 5.5 and 8, adequate fertility and irrigation. These crops are often grown on small acreages that may not be fully capable of providing a living to the operator, but may supplement a life style and other sources of income.

Small Fruits

Strawberries are shallow rooted crops that require moderately well to well drained soils with at least 50 cm of unrestricted rooting depth. **Raspberries** are deeper rooted and sensitive to "wet feet" and therefore require at least 100 cm of unrestricted rooting depth. Measures should be taken to control erosion of slopes greater than 10 percent.

Strawberries grow close to the soil and, in the spring, the blossoms are vulnerable to frost. Planting in areas with good air drainage or mulching to delay bloom are some of the techniques used to avoid spring frost problems. Planting day-neutral strawberries in beds raised 30 to 40 cm. and covered with black plastic and watering with a trickle irrigation system advances the planting and harvest dates for strawberries. The use of clear plastic tunnels, raised beds and trickle irrigation for crops such as strawberries and vegetables promote earliness, protect against spring frost damage and extends the market season.

Highbush Blueberries require soils that are at least moderately drained and hold adequate moisture during the summer months. Growing season water tables 30 to 60 cm beneath the soil surface is best. A drainage system combined with raised beds will permit the production of blueberries where the water table fluctuates to within 30 cm of the surface. Horticultural specialists suggest that highbush blueberries can be grown in areas of high or moderate suitability for McIntosh apples or grapes and areas where strawberries and raspberries can be grown, provided soil acidity is adjusted (if required) to a pH range of between 5 and 6.5 and suitable varieties are selected.

Blackberries require the similar soil conditions as raspberries. There are many blackberry varieties, some are thornless, and others have thorns. There are also blackberry hybrids that vary in hardiness.

Currants, both red and black, are more suited to heavier textured soils than to light textured soils. Black current juice is making a positive impact on the market as people become more familiar with this product.

Vegetable Crops

Vegetable crops can be grown in all areas of the City. They are successful over a range of climate conditions and on a wide range of soils provided these are well prepared and maintained, and are at least moderately well drained (i.e. the water table is at least 50 cm below the soil surface).

Vegetable crops such as **potatoes, carrots, turnips, onions, garlic, parsnips and other root crops** are preferably produced in sites where stones offer slight to no hindrance to cultivation and harvest. Mechanized harvesting on slopes greater than 10 percent tends to be difficult.

Successful production of annual, non-leafy vegetable crops such as **beans, lentils, peas, pumpkin, various melons, cabbage, broccoli, tomatoes and peppers** is possible on soils containing up to 50 percent coarse fragments (greater than 2 mm.).

Annual leafy vegetables with lower heat requirements such as **lettuce, celery, leeks, spinach, swiss chard, radish, celery** and other **salad greens** as well as **carrots, cauliflower, pickling cucumbers, beets and pumpkins** are rather tolerant to shallow water tables during the growing season and can be produced on the organic soil deposit near Swamp Road. These crops can be produced on various mineral soils as well.

Asparagus is a deep rooted crop that is best produced on deep, well drained, loamy and sandy soils.

Potatoes can be grown on a wide range of well prepared soils provided these are at least 60 to 80 cm deep, well drained and low in gravel and stone. The ideal soil for potatoes is deep sandy loam.

Specialty Crops

Lands that are suited for tree fruits, grapes and other local crops are also generally suited for **niche** crops, or the ingredients for niche products. Most medicinal plants are well suited to soils with neutral soil pH and a few are suited to soils with a pH as low as 4. Shade structures are required for ginseng but not for other medicinal plants, although a few prefer some shade. Most medicinal plants grow well in full sun.

Ginseng, goldenseal and echinacea species are primarily valued for their roots and require 3 to 4 years before the roots are harvested (echinacea flowers are harvested in the 2nd and 3rd year as well). These crops therefore would preferably be grown on sites with few or no gravel or stones in the soil that would interfere with harvest. Unlike ginseng, echinacea and goldenseal can be replanted in the same site after harvest.

Ginseng is a hardy crop and can be grown in most areas provided there is about 25 cm of relatively coarse fragment free surface soil and the water table is at least 60 cm below the surface.

Sea buckthorn is a hardy shrub and is adapted to sites with gravelly or stony soils, but not to areas that are wet. Sea buckthorn is a relatively new crop and is primarily produced for the berries and seed, but the leaves are suitable as feed for livestock.

Christmas tree production within the City is possible on all lands suitable for tree fruit and grape production as well as lands suitable for strawberries, raspberries and vegetables. Christmas trees are also suited to shallow and stony soils. Most agricultural lands except wetlands or organic soils are suited to the production of Christmas trees. Proper seed selection is an important part of Christmas tree production - the seed selected should delay the onset of terminal growth early in the growing season and thereby avoid damage from late spring frosts. Scotch pine is probably the best choice for the Kelowna area, although spruce and fir species are also suitable in some locations. Several small Christmas tree farms using "U-Cut" methods of sale currently operate within the City.

Greenhouse production is dependent on the availability of three-phase power and natural gas or another source of heat. As this type of agriculture is not soil bound there is no limitation on where such uses could locate, except as noted above. It is therefore possible to target lands that have marginal value for soil bound agriculture.

Mushroom production is not depended upon agricultural lands although producers require three phase power and natural gas.

Soil Suitability Sub-Area Details

1) Quail Ridge - Dry Valley Area:

Lands in the ALR in the vicinity of Lakeview Memorial cemetery, Dry Valley Road, Quail Ridge Golf Course west of Highway 97 and extending southward to the vicinity of Sexsmith Road are suited for production of tree fruits in most areas, as well as ginseng and other medicinal crops, potatoes, onions, forages, nursery crops, Christmas trees, livestock including beef, dairy, pigs, horses, poultry, and exotic animals. Greenhouses and mushroom production facilities are also suited where the required utilities are available.

2) The Glenmore Valley:

The area adjacent to Robert Lake is not suitable for tree fruits due the short growing season, the high frequency of late low winter temperatures, poor soil drainage and high soil salinity. Areas further away from the lake are suitable for a selection of forage and hay crops, livestock, Christmas trees and west or south facing slopes are also suitable for the production of leafy vegetables.

The low lying area in the vicinity of Valley and Cross Roads in the Glenmore Valley is generally not considered as being suitable for tree fruit production because of periodic high water tables, spring frosts damaging fruit blossoms, and high soil salinity.

Improved drainage would reduce the high water tables in these heavy textured soils and salinity could be reduced over time by irrigation. This would improve the soils so that they could produce a broader selection of forage and hay, and surface rooted vegetables. Other low lying areas of the Glenmore Valley rated as not suited to the production of tree fruits are similar to that previously described.

The ALR area in the vicinity of Dilworth Drive and Rifle Road has moderate soil suitability for tree fruits due to a water table in parts that fluctuates within 50 to 100 cm of the soil surface. Part of the drainage from this area has been restricted by infilled rock and soil, thereby reducing outflow. A small, partially blocked culvert also occurs, further restricting flow. Improved drainage would improve the agriculture capabilities for these lands. Apples, Anjou pears, strawberries, blueberries, some vegetables, nursery crops, forage and hay, and Christmas trees are suited for the area. A mushroom production facility that purchases its compost from the Fraser Valley is currently located in this area.

3) Valley Bottom from the Vicinity of Old Vernon Road North to Duck Lake:

The valley bottom bound by approximately Old Vernon Road on the south and Duck Lake at the north and between Highway 97 and the eastern City boundary is not suitable for most tree fruit crops. This area has a short growing season and a high frequency of low late winter temperatures that can cause significant damage to most fruit trees and/or blossoms. Italian prunes are the only tree fruit that is moderately suited for this area.

Part of this area has a fluctuating water table that occasionally intrudes to within 50 cm of the surface for short periods. These areas are suited to hay and forage crops, turf, silage corn, cereals, short season vegetables, livestock including beef, dairy, pigs, horses, poultry, and exotic animals such as llama, as well as ginseng and other medicinal crops; nursery crops; and Christmas trees. Some areas have a water table at less than 50 cm and are susceptible to flooding (e.g. in the vicinity of Bulman Road). These areas are seasonally suitable for forage and hay crops in current conditions. Artificial drainage and flood control would substantially improve the soil capability for agriculture and crop suitability.

4) Highway 97 Corridor - Rutland Flats Area:

The ALR generally bound by Old Vernon Road on the north, the toe of the Rutland benches on the east, Fitzpatrick Road on the south and including the lands between Highway 97 and Mill Creek southward to Cary Road are not classified for tree fruits on the CSMTF. This area is generally considered as not suited to tree fruits due to the frequency of early low winter temperatures and risk of spring frost.

This does not preclude the suitability for a wide range of other crops, however. These lands have a long production history for various vegetables, turf, strawberries, raspberries, nursery crops, as well as greenhouses that produce tomatoes, cucumbers, potted plants and bedding plants. These lands are also suited to the production of ginseng and other medicinal crops, greenhouses, mushrooms, nursery crops, Christmas trees, forages and various types of livestock enterprises.

5) Belgo, Garner, Lynrick, Gallagher Road Areas:

The slopes on the east, west, and north sides of Layer Cake Mountain and extending west along Gallagher Road are suited to the production of a wide selection of apples, Anjou pears, and sour cherries. Production of Bartlett pears is not recommended for this area on the CSMTF, but the suitability for Bartletts may be higher than is indicated on the map.

The area is also well suited for the production of strawberries, raspberries, blueberries, currents, vegetables, filberts, Christmas trees, greenhouse crops, mushrooms, livestock, forages and hay, and nursery crops. South facing slopes are also suited for grapes. The area east of Gallagher Road to the city boundary is suitable for forages and hay, vegetables, filberts and Christmas trees, among others.

6) Benvoulin - Mission Flats Area:

The general area bound by Springfield Road on the north, Mission Creek on the east, Gordon Drive on the west and Casorso Road on the south is moderately poorly drained with fluctuating water tables between 50 to 100 cm from the soil surface. Some parts of the area are currently drained with underground tile. When artificially drained these soils are highly to moderately suited for a selection of tree fruits. At the present time this area produces Anjou pears (Bartlett as pollinators); apples; prunes; and plums. Damage to blossoms by spring frost limits the production of some tree fruits in this area along Mission Creek.

At the present time vegetables, forages and hay, strawberries, nursery crops, and various kinds of livestock including beef and horses is also produced. Other possible crops include blueberries, raspberries, turf, cereal crops, and Christmas trees as well as poultry and exotic animals. Artificial drainage of this area would improve the agricultural capability and crop suitability of these lands.

The area generally south of Casorso Road and south of Mission Creek including the City's playing fields and Michaelbrook Golf Course and the organic soils in the vicinity of Swamp Road periodically flood in the early summer during freshet runoff in Mission Creek. The water table is from 0 cm to within 75 cm of the surface making the area currently unsuited for tree fruits. However, the area is climatically suited to a selection of tree fruits such as Italian prunes, plums, Anjou pears, and Gala and Sunrise apples.

The area is presently used for the production of forage, hay, and livestock after the water table drops. Improved drainage of the entire area is needed to improve the agriculture capability and crop suitability of the land. The organic soil deposit is not generally suited to the production of tree fruits, but is suited to the production of a selection of vegetables including leafy vegetables, celery, leeks, carrots, cauliflower, cucumbers, radish, beets, pumpkins, lettuce, green onions, and peppers.



TRANSPORTATION NETWORK

The nature and scope of the transportation system has profound bearing on agricultural activities. The road network not only provides access for farm operators to conduct their business but also provides access for non-agricultural and recreation uses.

The City of Kelowna has endorsed a Transportation Plan (November 1995) as a companion document to the Official Community Plan. The Transportation Plan focuses on Transportation Demand Management (TDM), Pedestrian, Bicycle, Transit and Road Network objectives and policies. The Plan recognizes the strong relationship between transportation and the OCP Growth Strategy (land use).

The Transportation Plan documents existing conditions, outlines road classification and standards and establishes future requirements and standards based on network considerations and future land use.

Existing Road Network

The system of arterial, collector, and local roads is outlined on Figure 7.20a of the Transportation Plan. The majority of Kelowna's roadway network consists of two lane roadways, particularly in rural/agricultural areas. The existing rural road network is generally constructed to a rural standard, regardless of the classification or function of the route. At this time rural road maintenance is the responsibility of the Ministry of Transportation and Highways and is contracted out to private maintenance companies.

Within rural areas the road network is comprised of a combination of: dedicated, constructed roads; constructed roads not formally dedicated (Section 4 roads); and unconstructed but dedicated rights-of-way. In some areas, such as Southeast Kelowna, the road network is a complicated network of constructed and unconstructed roads based on topography and historical farm subdivision patterns.

Future Road Network

The future road network is outlined on **Map 12 - 20 Year Major Road Network**. There may be minor changes to the network in terms of road classification based on new roads to be constructed within the 20 year planning horizon. The Transportation Plan indicates the roads that will be improved or constructed within the 20 year planning horizon, largely from Development Cost Charge funds derived from new development. **Table 4** is a list of those roads within rural areas, and indicates the roads by classification, number of lanes, and as new or upgraded facilities. Upgrading of McCulloch Road from funds contributed by Gallagher's Golf Resort has largely been completed.

Bicycle Network

The formal designated future bicycle network is limited to specific roads in rural areas as indicated on Figure 5.8 of the Transportation Plan. However, it should be recognized that all roads are open to bicycles.

Table 4 - 20 Year Road Improvement Plan
 (partial table - for rural roads only)

Road Name	Classification	Number of Lanes	Status
Valley	Arterial	2 lanes	Upgrade
Sexsmith west of Longhill	Arterial	2 lanes	Upgrade
Longhill from Rifle to Sexsmith	Arterial	2 lanes	Upgrade
Rutland Road N.	Arterial	4 lanes	Upgrade
McCurdy east to McKenzie	Arterial	2 lanes	New
McCurdy west to North End Connector	Arterial	2 lanes	New
Hollywood to East Kelowna	Arterial	2 lanes	New
Benvoulin	Arterial	4 lanes	Upgrade
Swamp	Arterial	2 lanes	Upgrade
Casorso / Stewart Road West	Arterial	2 lanes	Upgrade
Spiers	Arterial	2 lanes	Upgrade
Gulley	Arterial	2 lanes	New
McLain	Arterial	2 lanes	New

There are three classifications within the bicycle network: bike routes which are shared with vehicles; bike paths which are separate facilities; and bike lanes which share a portion of the road but are marked by painted lines, symbols, or signage.

Bike routes within rural areas are designated on East Kelowna Road, June Springs Road, Matthews Road, Wallace Hill Road, Baldock Road, Saucier Road, Crawford Road, and Dehart Road.

The only designated bike path within the rural areas is the Mission Creek Corridor.

Bike lanes within rural areas are designated on Glenmore Road, Old Vernon Road, Sexsmith Road, Longhill / Rifle Road, Valley Road, Hollywood Road, Rutland Road, McCurdy Road, North End Connector, Byrns Road, KLO Road, McCulloch Road, Gulley Road, Spiers Road, Casorso Road, Stewart Road West, and Swamp Road.

Truck Routes

The City of Kelowna has designated a formal system of truck routes. Trucks are generally restricted to these routes, however, it is recognized that not all trucking needs would be served by the designated routes and other roads may be used, as needed, to travel in as direct a route as possible to and from designated truck routes.

Trucks may use Highway 97, Highway 33, and Rutland Road North on a 24 hour basis. McCulloch Road, KLO Road, Swamp Road, Benvoulin Road, Sexsmith Road, Longhill Road, and Scenic Road may be used as a truck route between the hours of 7:00 AM and 11:00 PM. Glenmore Road and Byrns Road may be used as a truck route between the hours of 7:00 AM and 7:00 PM.

2 LANE

2 LANE (subject to alignment resolution)

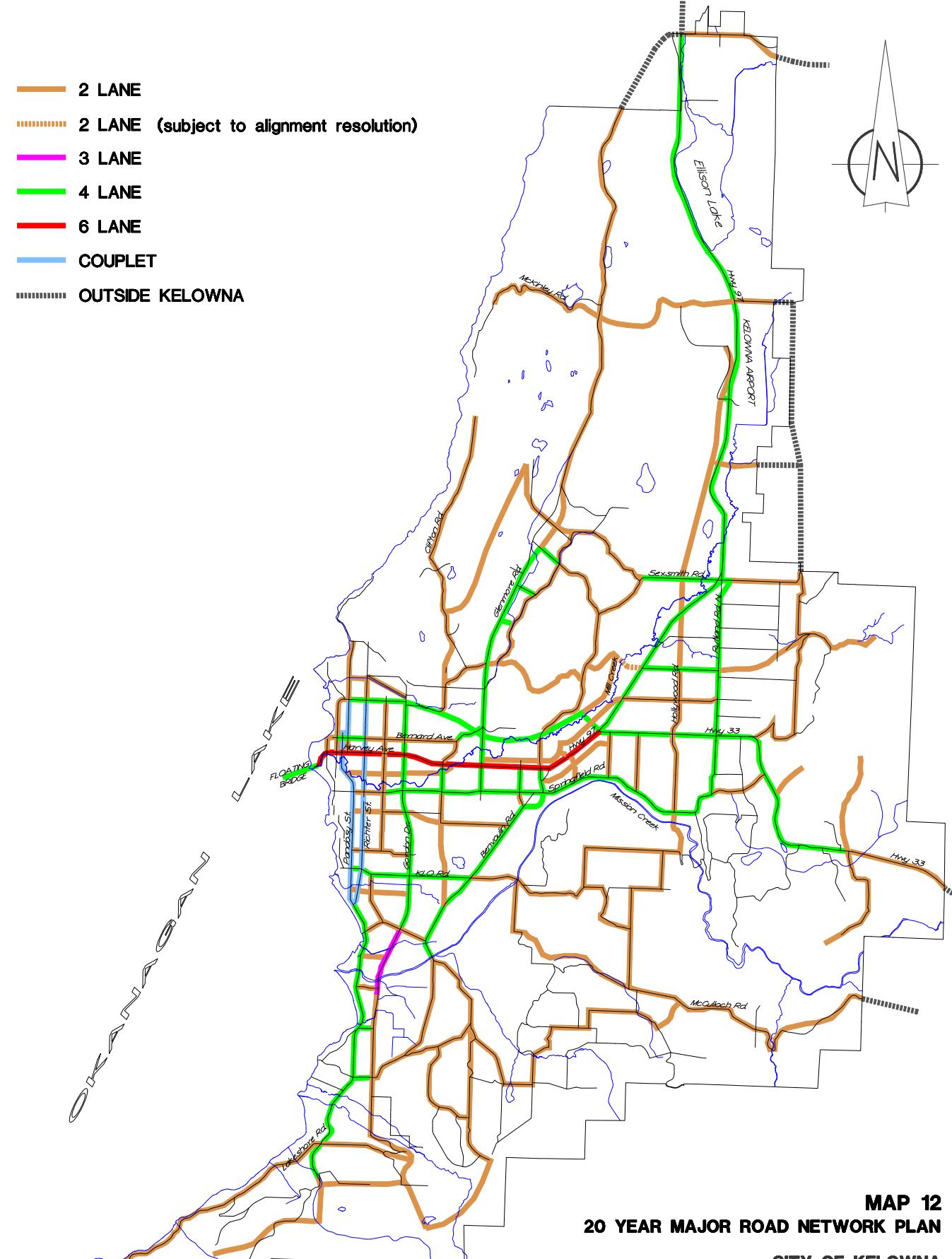
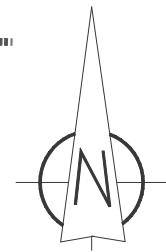
3 LANE

4 LANE

6 LANE

COUPLET

OUTSIDE KELOWNA



This map is for general information only.
The City of Kelowna does not guarantee its
accuracy. All information should be verified.

MAP 12
20 YEAR MAJOR ROAD NETWORK PLAN
CITY OF KELOWNA
AGRICULTURE PLAN

0 1000m 2000m 3000m

REV. AUG. 13/96

UTILITIES

Water Supply

An Agricultural Water Supply Study (Mould Engineering Services Ltd., February 1997) prepared for the City of Kelowna outlines the water supply background, consumption, economics, and infrastructure condition, as noted below.

Background

The availability of water for irrigation purposes, in sufficient quantity and at an affordable cost, is fundamental to the viability of agriculture in this semi-arid area. The water supply situation in Kelowna is undoubtedly one of the most complex in the Province, both structurally and administratively. There are three major community owned irrigation systems, two large urban systems, several small community systems and numerous small private systems. The three major irrigation water purveyors are Black Mountain Irrigation District, South East Kelowna Irrigation District and Glenmore-Ellison Improvement District. A fourth Irrigation District, South Okanagan Mission Irrigation District, is a smaller District located near the south boundary of the City of Kelowna. The City of Kelowna and Rutland Waterworks District also operate large urban water systems within the City but supply very little commercial agriculture.

The three major Irrigation Districts supply water to a large number of residential and commercial users as well as to agricultural land. The bulk of the water supply for the Irrigation Districts comes from three watersheds tributary to Okanagan Lake; Mission, Kelowna and Bellevue Creeks. All four Irrigation Districts also have supplementary supplies from high capacity groundwater wells. The four small community systems that supply irrigation water include Mission Creek, Guisachan, South Kelowna and Benvoulin Water Users Communities. The Water User Communities are located in the flood plain of Mission Creek and are supplied by ditches from natural flows in the creek. The Water Users Communities are dealt with separately as they operate a completely different type of system and have different problems from the Irrigation Districts. The Communities have been grouped as a single entity for discussion purposes although they are individual groups.

There are also numerous privately owned irrigation systems that supply lands within the City. These systems utilize a wide variety of water sources with shallow wells being the most common.

Irrigation Districts

The four Irrigation Districts supply about 90% of the irrigated land within the City. The Irrigation Districts were formed in the early 1920's as a result of the collapse of private companies. The Province enacted legislation (Water Act, 1919) and provided funding to enable landowners to own and operate the irrigation systems. The legislation governing the operations of the Districts is now contained in the Municipal Act and by virtue of strong legislation and a long history of operations, the Districts have established competent and efficient operation and management structures.

An unusual aspect of the three large Irrigation Districts and a feature which is, and will continue to be, a major challenge to the managers of these systems is that the distribution systems supply both irrigation and domestic water with the same pipelines. Residential users are demanding better water quality than is presently provided but the solutions for making improvements are made more difficult as a result of the large quantities of irrigation water involved.

An important informal organization, established in the early 1990's, that contributes to making the operation of the Districts successful is the Kelowna Joint Water Committee (KJWC). This Committee, which includes representatives from City of Kelowna and Rutland Waterworks District as well as the three larger Irrigation Districts, ensures that planning matters are addressed and that the water purveyors are operating in a co-ordinated manner. The KJWC sets standards for the installation of water systems, addresses issues affecting all purveyors, and provides a community wide public information program.

Black Mountain Irrigation District

The Black Mountain Irrigation District (BMID) services lands along the eastern side of the City. The District is bounded by Mission Creek to the south, un-serviced high elevation land to the east, the Rutland Waterworks District (RWD) and Highway 97 to the west, and the Glenmore-Ellison Improvement District (GEID) and un-serviced Regional District lands to the north.

The land use in the District is primarily residential in the lower areas on the Rutland flatlands and agricultural on the eastern slopes. Irrigation for agriculture is about 65% of the total water use in the District.

The primary source of water is Mission Creek with four storage reservoirs in the upper watershed. The largest secondary source is Scotty Creek in the north end of the District. A high capacity well on Cornish Road provides a source of water to the lower area in times of emergency.

In total, BMID has 13,840 da-m³ of licensed storage in the Mission Creek watershed and 2,334 da-m³ in the Scotty Creek watershed. Licensing for withdrawals on Mission Creek include 17,865 da-m³ for irrigation and another 3,495 da-m³ for waterworks (domestic water use) purposes. Note: da-m³ means cubic decametre (1 cubic decametre equals 1000 cubic metres).

Glenmore-Ellison Improvement District

The Glenmore-Ellison Improvement District (GEID) supplies water to about 1,300 hectares of agricultural land and 2,850 residential services in the northwest sector of the City. The total area supplied includes some lands that are outside the District such as Kelowna Golf and Country Club, which are supplied under special service agreements.

The principal water source for the District is the 77 km Mill (Kelowna) Creek watershed with upper elevation storage reservoirs located at Bulman, Postill and South Lakes. A large, lower elevation balancing/storage reservoir near McKinley Road (McKinley Reservoir) is supplied by a pipeline crossing the valley at the North end of the airport.

The reservoir balances system demand with creek flows as well provides storage.

Present licensing for irrigation diversion (agriculture purposes) includes 10,943 da-m³ from Mill (Kelowna) Creek and 2,220 da-m³ from Okanagan Lake. Licensing provides for diversion of 519 da-m³ from Mill (Kelowna) Creek for waterworks purposes. Storage licensing includes 6,647 da-m³ from Postill Lake and South Lake, 1,233 da-m³ from Bulman Creek and 691 da-m³ from Conroy Creek for a total of 8,571 da-m³. The Okanagan Lake licences are not used at present but are available for future users.

The District also has four high capacity wells (one of which is in Ellison) which are used during periods of high demand or low runoff in the watershed. No water licenses are presently issued for groundwater supply.

South East Kelowna Irrigation District

The area serviced by the South East Kelowna Irrigation District (SEKID) is generally east and south of Mission Creek. The area within the District boundaries comprises about 3,744 hectares of land of which 2,200 hectares are supplied with water. The balance, 1,544 hectares, is only partly developable due to topographic constraints (steep slopes, bedrock etc.). The irrigated land area totals 2,070 hectares with 1,270 residential and commercial service connections. It should be noted that the Gallaghers Canyon Golf Course has been included in the total area supplied by the District, although the golf course utilizes a private system pumping from Mission Creek in years when the District is short of water.

The principal sources of water for the District are the Hydraulic, KLO and Stirling Creek watersheds with storage reservoirs on McCulloch, Haynes, Fish, Browne and Long Meadows Lakes. In addition to the surface water supplies, the District has developed three high capacity groundwater wells in the northwest part of the District; East Kelowna Road Wells No. 1 and 2, and O'Reilly Road Well. O'Reilly Road Well is located in a residential area and is only used for domestic purposes.

Present licensing for storage includes 18,526 da-m³ on McCulloch Lake, 1,196 da-m³ from Haynes Lake, 881 da-m³ from Browne Lake, 216 da-m³ from Fish Lake and 617 da-m³ from Long Meadow Lake for a total of 21,436 da-m³.

South Okanagan Mission Irrigation District

The South Okanagan Mission Irrigation District (SOMID) supplies water to about 75 ha of agricultural land in the Chute Lake/ Barnaby/Lakeshore Roads area. The primary source of supply is Bellevue Creek with off-stream storage on Jack Smith and Fraser Lakes. The District also has two wells that are utilized if the surface water supply is inadequate. The wells are only used in emergency conditions due to poor water quality and high pumping costs. SOMID does not supply domestic water to its' landowners.

Mission Creek Water User Communities

The Communities are legal entities formed under the Water Act but have much less authority than the Irrigation Districts. They are essentially groups of private water licenses who operate joint works and share operating costs. The Communities were formed in the early years of development in Kelowna and much larger areas were irrigated than occurs today. Much of the original irrigated land base has been converted to urban development leaving about 150 hectares presently supplied. The works generally are falling into serious state of disrepair.

A serious problem for the Communities lies in the fact that many of the ditches are located on private property with no easements. Some landowners have filled the ditches in cutting off downstream users. The long term status of these water systems and the areas supplied are very much in doubt. The provision of irrigation water to this area needs to be studied in more detail if these lands are to continue to be productive.

Private Systems

Numerous private irrigation systems have been installed to irrigate agricultural lands in the City. The most common source is wells with Okanagan Lake and Kelowna Creek also providing significant amounts. The irrigated lands are usually close to the sources and pumping is almost always involved. The amount of land irrigated by private systems totals about 450 hectares with the main concentration being along Kelowna Creek, both north and south of the airport. The other main irrigated area is along Okanagan Lake, south of Okanagan Mission.

Annual Water Consumption

The total amounts of water supplied annually by the Irrigation Districts, together with estimates of the irrigation and domestic components are contained in Appendix II. The domestic component of the total use was estimated using the number of residential services in each area multiplied by typical residential usage. Irrigation usage was then calculated by deducting the estimated residential use from the total.

Peak use years are the most important for water supply systems and, in the case of BMID and SEKID, a slight decline in total annual use is evident in peak years. The decline is in spite of large increases in the number of residential units, which have doubled, in the last 20 years. In SEKID there were substantial increases in irrigated land whereas BMID had a small decrease.

GEID shows a small increase in water use over time but this increase is partly due to amalgamation with the Ellison Irrigation District in 1990 and partly to very large increases in the number of residential services. The number of domestic units in GEID increased from 800 to 3,200 in seven years.

The explanation for the apparently contradictory situation of increasing number of users but decreasing annual water use results from several factors. More efficient irrigation equipment (drip, trickle, microjets, permanent set systems) in both residential and irrigated agricultural areas has reduced per unit demands. Also, most of the increases in residential users have occurred on irrigated land and the net impact of the land use

change on annual water use is a slight decrease. For instance, when 10 hectares of agricultural land are subdivided into residential lots, the total annual water use will be slightly less.

A related and important change in water use that has occurred over the past few years is the reduction in peak day flows. The peaks between 5:00 and 9:00 PM have been reduced considerably with the recent changes in residential sprinkler practices and the reduction in the use of portable sprinklers in irrigated agriculture. Water wastage in emptying and re-filling pipes resulted during changing of sprinkler locations. Portable sprinklers are less commonly used today than was the case in the past and the morning and evening peaks resulting from changing sprinkler locations have been reduced accordingly. The changes in time of use and type of sprinkler systems has reduced balancing storage requirements and allowed distribution systems to supply more land than they were originally designed for.

Irrigation Water Economics

Irrigation water supplied to farmers by the major water purveyors is billed on a flat rate per unit area basis. The rates for irrigation and domestic water for the twenty year period from 1976 are shown in **Table 5 - Irrigation and Single Family Domestic Water Rates**.

Table 5 - Irrigation and Single Family Domestic Water Rates

	1976	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996
BMID												
Domestic rate/unit	\$72	\$84	\$84	\$96	\$102	\$102	\$102	\$126	\$144	\$168	\$186	\$192
Irrigation rate/hectare	\$74	\$74	\$74	\$80	\$86	\$86	\$91	\$99	\$106	\$109	\$112	\$115
GEID												
Domestic rate/unit	\$60	\$96	\$96	\$102	\$102	\$102	\$108	\$108	\$120	\$138	\$156	\$168
Irrigation rate/hectare	\$61	\$61	\$67	\$67	\$67	\$67	\$67	\$67	\$74	\$82	\$86	\$91
SEKID												
Domestic rate/unit	\$72	\$72	\$72	\$108	\$120	\$120	\$132	\$144	\$144	\$156	\$156	\$156
Irrigation rate/hectare	\$124	\$124	\$124	\$143	\$148	\$148	\$148	\$148	\$148	\$148	\$148	\$148
SOMID												
Irrigation rate/hectare										\$331	\$331	\$331

Water costs over the past twenty years have increased at a rate considerably less than inflation. In real terms, the cost of water is approximately one-half of what it was 20 years ago. The average operating cost of growing tree fruits, according to the Okanagan Valley Tree Fruit Authority, is estimated to be about \$7,400 per hectare. The cost of water averages \$125 per hectare so irrigation water is only 2% of the cost of producing a crop. Tree fruits are the most common crops grown in the area and the only crop for which reliable data on operating costs is available.

For other agricultural commodities, water will be a higher component of total operating expenses but still a relatively low percentage. An important factor in the relatively low cost of irrigation water is the dual use of the water system. Domestic users contribute a very significant portion of the revenues needed for operations. **Table 6 - Domestic and Irrigation Total Revenues - 1995** shows the relative amounts derived from each user group.

Table 6 - Domestic and Irrigation Total Revenues - 1995

	BMID	GEID	SEKID	SOMID
Irrigation	\$230,323	\$158,575	\$347,652	\$25,460
Domestic	\$1,051,489	\$451,555	\$210,114	nil
Total	\$1,281,812	\$670,130	\$557,766	\$25,460

The table shows that irrigation water rates in BMID and GEID yield only 20% of the total operating revenue. In SEKID, there are fewer domestic services and irrigation rates generate a much higher proportion of total revenue (60%).

Infrastructure Condition

The water systems operated by the four Irrigation Districts were largely re-built in the late 1960's and early 1970's under a Federal-Provincial Infrastructure Program (ARDA). These systems are now 20 - 30 years old and some of the components such as pump stations and pressure regulating facilities are nearing the end of their expected life. Pipelines, which make up the bulk of the distribution systems, have a life expectancy of 50 years or longer so large expenditures on pipeline renewals are not anticipated.

Works in the watersheds include storage reservoirs, diversion works and control structures. These facilities were generally built to last for long periods of time and only routine maintenance work will be required for the next 20 years or longer.

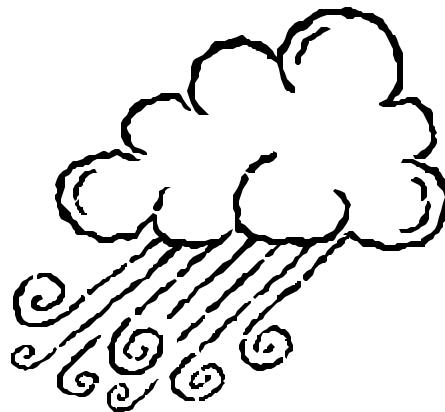
The large increases in residential services have also resulted in the installation of extensive distribution system works and upgrading of many of the facilities that were approaching their life expectancy. The result of this upgrading has reduced the amount of works that need to be replaced for age considerations.

The Irrigation Districts have also created renewal reserve funds for replacement of ageing infrastructure. The infrastructure condition is considered to be in reasonably good shape and the Districts are maintaining adequate reserve funds to replace deteriorating

components. Infrastructure condition does not appear to be a major issue for the Irrigation Districts.

The works operated by the Mission Creek Water User Communities were generally installed in the late 1890's and early 1900's. The works consist mainly of earthen ditches and wooden control structures, which are relatively easy to maintain, but the works have deteriorated to the extent that many are unusable or have reduced capacity. The amount of land that is being irrigated from these systems has been reduced and many landowners have switched to wells so the amount of land needing water from the ditches is much less than previously was the case.

The Benvoulin area is within the City of Kelowna future water service area but consideration of expansion of the City system to service agricultural users would first require comprehensive analysis and planning. It is important to the long term survival of agriculture in this area to develop a plan for the supply of irrigation water. A Benvoulin Water Users Community Water Supply Study was conducted by the Ministry of Environment in 1979 on potential water sources and the economics of creating a pressurized system, but this study may need updating.



Storm Drainage / Drainage Courses

Watercourses within the City of Kelowna are identified on **Map 5 – Watercourses, Waterbodies, and Wetlands**. Of these watercourses there are a number that have significant influence on or from agricultural areas: Mill (Kelowna) Creek, Brandt's Creek, Campbell Brook, Fascieux Creek, Gopher Creek, Wilson Creek, Mission Creek, Michael Brook, Thomson Creek, Priest Creek, Rumohr Creek.

In addition, there are a number of wetlands, ponds, lakes, and marshes of significance within agricultural areas: Ellison Lake, Kelowna Springs, Robert Lake, Campbell Brook, Garner / Belgo Ponds, Munson Pond, Casorso Marsh, Pandosy Marsh, Wilson Slough, Rumohr Creek Wetland, and the Swamp Road area.

A significant amount of background work and studies have been undertaken to assist in managing drainage and storm water issues, as summarized below.

Stormwater Management Policies and Design Manual

A Stormwater Management Policies and Design Manual (Dayton & Knight Ltd., Feb. 1991) was developed to ensure that uniform standards are applied to new development to prevent damage to existing downstream properties, and to prevent future problems in the new developments. Essentially, runoff from small rainstorms will be collected and piped and runoff from more intense storms will flow overland through streets and rights-of-way, without causing damage, up to a certain magnitude of rainstorm. Many existing areas in the City do not meet present standards, and the cost of upgrading will be substantial. The Stormwater Management Policies and Design Manual recommended the preparation of Basin Management Plans for each drainage basin.

Basin Management Plans

Ellison Basins

The Ellison Basins Drainage Management Plan (Dayton & Knight Ltd.) was completed in December 1995 covering the northeast area of the City and includes the Vernon Creek Basin and the Upper Mill (Kelowna) Creek Basin. The Upper Mill (Kelowna) Creek Basin includes 5 watersheds: Mill (Kelowna) Creek, Whelan Creek, Scotty Creek, Campbell Brook, and Kelowna Springs, and 27 sub-basins.

The Management Plan indicates that ground water recharge and discharge is significant, particularly in the Mill (Kelowna) Creek Basin. Aquifers in upper areas outside the City and surrounding steep hillside faces store and discharge water to low lying spots in the lower valley. Minor flooding is due to undersized culverts or insufficient channel capacity. High water table conditions and groundwater recharge creates drainage difficulties. Artesian conditions exist north of Cornish Road. Localized flooding occurs on a regular basis along portions of Mill (Kelowna) Creek and in the Kelowna Springs area.

The Management Plan recommends a program of culvert and in-channel upgrades and hydraulic improvements that could alleviate the nuisance factor of the occasional flooding of adjacent farmland under existing conditions.

The Basin Management Plan also discusses a high development scenario where lands east of the ALR, within the Regional District, could be developed with up to a factor of 25 % impervious conditions. Under this scenario, a combination of detention storage facilities, that could include constructed wetlands for water quality improvements, and channel improvements, that could include hydraulic upgrades, culvert upgrades, and in-channel wetland construction, would be required. The Plan also recommends the retention of riparian vegetation and hedgerows.

For Vernon Creek there would need to be an in-channel wetland on the inflow portion at the north end of Ellison Lake, outside the ALR, and hydraulic upgrades on the outflow portion from Ellison Lake through Okanagan First Nation's lands.

For Upper Mill (Kelowna) Creek there would need to be up to 4 detention storage facilities plus significant in-channel wetlands. The 4 identified locations for detention facility / wetland construction are: east of the Airport, north of Bulman Road on Shadow Ridge Golf Course or south of Bulman Road on farmland, east of Kelowna Springs Golf

Course, and north of Moyer Road east of Rutland Road North. All of these locations are in the ALR. In-channel wetlands are proposed for a portion of Campbell Brook in the vicinity of McKenzie Road at McCurdy Road, and all of Mill (Kelowna) Creek from the Airport to Hwy 97 south of Sexsmith Road.

Brandt's Creek Basin Study

The Brandt's Creek Basin Study (Dayton & Knight Ltd.) was completed in July 1992 and covers the northern and southern portions of Glenmore Valley and inner city areas to Okanagan Lake. The Study is divided into two parts, Brandt's Creek North and Brandt's Creek South.

The northern portion of the Basin Study, generally north of Scenic Road area, includes McKinley Reservoir, Robert Lake, and other wetlands adjacent to Glenmore Road and Glenmore Highlands. The basin is a sink and there is no surface outflow. Water accumulates in depressions, lakes and ponds. Water is lost through evapotranspiration or as sub-surface drainage in groundwater flows to the south. The Study recommends management on the perimeter of Robert Lake to restrict land uses and ensure storage capacity.

The southern portion of the Basin Study covers the east and west arms of Brandt's Creek from approximately Scenic Road to Okanagan Lake. A series of 8 detention facilities and other channel improvements on the west arm is largely complete through the redevelopment of that portion of the Glenmore Valley. The east arm is largely confined to a ditch along Valley Road, particularly in the southern portion. The Basin Study recommends 2 detention facilities on the east arm of Brandt's Creek, both within the ALR, as well as channel improvements south of Longhill Road. The first detention facility would be east of Valley Road south of Longhill Road, and the second would be east of Valley Road in the vicinity of Raisanen Road.

Lower Mill (Kelowna) Creek Basin Drainage Plan

The Lower Mill (Kelowna) Creek Basin Drainage Plan (UMA Engineering Ltd.) was completed in July 1996 covering the balance of Mill (Kelowna) Creek, generally, south of Sexsmith Road, including the lower reaches in the inner City area. The Drainage Plan focuses on stream crossing upgrades, stream / riparian management areas, stabilization of erosion areas, and improving storm water quality prior to discharge to the creek.

The stream / riparian management area is intended to enhance water quality and habitat, and minimize future flood damage through in-stream retention. Detention facilities upstream, within the Upper Mill (Kelowna) Creek Basin would reduce downstream peak flows so that flood control would be handled with channel protection and improvements. The Drainage Plan recommends a 15 metre corridor on each side of Mill (Kelowna) Creek for the stream management area. The OCP also designates a Stream Protection Corridor Leave Strip of 15 m in fish habitat areas and 10 m where no fish are present.

The Drainage Plan also recommends extended detention facilities to improve water quality prior to discharge. These facilities would be required in conjunction with development, and all but one are located in non-ALR areas within existing or future development areas. The exception is a detention facility east of Highway 97, north of Scandia.

Gopher Creek Basin Study

The Gopher Creek Basin Study (Dayton & Knight Ltd.) was completed in November 1992 and encompasses the Belgo - Black Mountain area, a portion of the Rutland bench area north of Mine Hill, and the urbanized areas of eastern and northern Rutland. The Study includes Gopher Creek, from Black Mountain through Belgo to a piped system beginning at Springfield Road that discharges to an open channel near Sumac Road (Chichester Pond) before the confluence with Kelowna Creek, and several intermittent streams. Belgo Creek drains north to Springfield Road along Belgo Road, Francis Brook drains west from the Rutland bench area along McKenzie Road, and Buckland - Webster Creek drains west from the Rutland bench area south of Webster Road.

The Basin Study recommends the use of detention facilities, including potential wetland construction for treatment, and open channel improvements, as well as twinning pipes through the urban area of Rutland. Detention facilities would be necessary along Gopher Creek at Gallagher Road, Lynrick Road, Springfield Road, and Chichester Pond. Other detention facilities would be created at the beginning of Francis Brook east of McKenzie Road and east of Bell Mountain in the Gopher Flats area as additions to existing sinks or wetland areas. In addition, a diversion of some water from Gopher Creek to Belgo Pond would allow the use of this existing water body for detention purposes and reduce the size of facility necessary at Springfield Road. Belgo Pond, the proposed facilities at Springfield Road, Francis Brook, and Gopher Flats are all in the ALR. The Gopher Flats location is also the proposed location of a future Black Mountain Irrigation District reservoir.

South Rutland Basin Study

The South Rutland Basin Study (Urban Systems Ltd.) was completed in December 1993 and encompasses several sub-catchment areas from the Hollywood Road South area to Dilworth Drive along the Springfield Road corridor. Most of the drainage in the South Rutland area north of Springfield flows to the Kelowna Creek Basin through the urban storm sewer network. For the areas south of Springfield Road the drainage is through ground disposal. The area west of Parkview Crescent flows into the Fascieux Creek Basin and during extreme storm events run-off may reach the irrigation channel.

Generally, this Basin Study deals with urban runoff or facilities and improvements within an urban area to handle storm water. However, the western portion of the South Rutland Basin may drain into the irrigation system used by the Benvoulin Water Users Community and ultimately into Fascieux Creek. Given the potential for contamination of storm water, the drainage of this area into the irrigation channel should be discontinued to avoid contaminants entering the food chain. Of the four proposed detention facilities recommended by this Basin Study, three are within the urban area adjacent to Mission Creek. The fourth would be located adjacent to Mission Creek, within the ALR, south of Springfield Road and east of the proposed Dilworth extension. However, both the third

and fourth detention facilities are located close to or as part of the irrigation system paralleling Mission Creek. This Basin Study recommends that the irrigation ditch be realigned so that it passes between the proposed detention ponds and the Mission Creek dike. A second option is that the irrigation ditch pass through the proposed ponds, but that the design of the ponds would allow the overflow to be separated from the irrigation ditch and that water would then be continuously passing through the pond to create a wetland to assist in maintaining the quality of water through the irrigation system.

Fascieux Creek Basin Study

The Fascieux Creek Basin Study (UMA Engineering Ltd.) was completed in June 1994 and encompasses both the north and south arms in the area generally west of Mission Creek, between Lanfranco Road and Springfield Road. The north arm west of Burtch Road is an urbanized condition, as is the south arm to the west of the Bothe Road area. East of these locations is farmland within the ALR. The water source for Fascieux Creek originates east of Benvoulin and is ground water or natural springs, augmented by irrigation water. There are two aquifers in the Fascieux Creek Basin with general ground water flow to the southwest, a shallow unconfined aquifer, and a lower, confined aquifer that creates artesian conditions. The Study area contains sloughs, ponds and abandoned creek channels, some of which have been filled and these features could be either ground water recharge or discharge areas depending on the time of year and precipitation. Fascieux Creek is primarily located on private property, therefore, maintenance is possible only on those portions adjacent to roads or on other public property. The creek channels have been partially filled in some areas and used as dumping areas for adjacent property owners, which has restricted the capacity of the creek channels.

The Basin Study recommends that maintenance of the creek channels and roadside ditch system be improved, and that future detention capacity on the north arm of Fascieux Creek be retained on the Kelowna Pollution Control Centre (KPCC) site. Any future development of agricultural lands in the area could require up to 3 additional detention facilities, likely in conjunction with existing ponds or wetlands within the agricultural area.

Mission Creek Basin Study

The Mission Creek Basin Study (Urban Systems Ltd.) was completed in October 1996 and encompasses a large watershed, with nearly 90 % of the watershed outside the City of Kelowna boundary. However, the major focus of the Basin Study is on the watershed area within the City and includes Mission Creek, Priest Creek, Hachey Creek, Rumohr Creek, Thomson Creek, and Wilson Creek. Urban development accounts for approximately 2 % of the total watershed area, or about 20 % of the watershed area within the City. There are two aquifers in the Mission Creek Basin. A shallow unconfined aquifer, generally within 20 m of the surface, is recharged by direct precipitation and some excess irrigation water. The lower, confined aquifer is recharged through upper aquifer leakage, direct precipitation and in some areas, infiltration from Mission Creek. Artesian conditions have been noticed in the Thomson Creek area.

In addition to the creeks that flow directly to Mission Creek there are ground water discharge areas in the Hall Road / Spiers Road area and the area south of Mission Creek to Dehart Road between Gordon Drive and the toe of slope east of Swamp Road. Overall ground water flows occur from the Southeast Kelowna area to the Swamp Road area and Mission Creek, and in the area north of Mission Creek to Wilson Creek, Fascieux Creek and Lake Okanagan. In general, sub-surface storm water disposal quickly exceeds the infiltration capacity of the soils in the Swamp Road area, contributing to the wet conditions west of the toe of the slope. Mission Creek is assumed to be in direct contact with the shallow ground water regime and both discharge and recharge conditions occur depending on the level of water in Mission Creek. In addition, high water table conditions exist due to proximity to Okanagan Lake, which limits the rate that ground water leaves the discharge areas.

The wetland areas associated with Wilson Creek (Pandosy Marsh), Rumohr Creek, Priest Creek (Casorso Marsh), and Mission Creek provide significant aesthetic benefits and also play an important role in the balance of ground water discharge / recharge in the lower Mission Creek basin. The Basin Study recommends the use of detention facilities, either as engineered wetlands or enhancement of existing wetlands, as well as channel improvements and ditch maintenance to manage storm drainage. The Basin Study also recommends specific facilities or improvements in each of seven sub-watersheds.

Belgo Road Sub-watershed: There is no well-defined watercourse draining this area. Drainage occurs using existing roadside ditches down to Hollywood Road South and then to Mission Creek. As long as no additional development occurs there would only be a need to improve ditch maintenance and some culverts in the area. Any detention facilities would be for future development or water quality improvements only.

East Kelowna Sub-watershed: There is no well-defined watercourse draining this area. Drainage occurs using existing roadside ditches to the Hall Road neighbourhood, which is a ground water discharge area. Some local flooding occurs, particularly in areas where ponds exist. There will be a need to reconstruct some roads in the area, including curb and gutter, to act as drainage channels to direct flows to Hall Road and Wildwood Road, and then to two potential detention facilities adjacent to Mission Creek prior, to discharge to Mission Creek. The detention facilities would be for water quality improvements only. The land between Mission Creek and the urban development is in the ALR at this time. Two other detention facilities east of the Hall Road area would be for future development only.

Rumohr Creek Sub-watershed: This area has a well-defined drainage path that includes Gulley Road. There should be improved ditch maintenance to convey water to the creek, and channel and culvert improvements. It will be necessary to construct significant drainage works in conjunction with the construction of Gulley Road. This sub-watershed also requires the use of two detention facilities; one near Gulley Road and McCulloch Road (constructed) and the other adjacent to Mission Creek in the Rumohr Creek wetland area (enhancement of natural wetland). Both of these sites are in the ALR. A third potential site on the East Kelowna ballfields would only be necessary for additional development.

Priest Creek Sub-watershed: There is a well-defined drainage path through this area that includes Hachey Creek. There should be improved ditch maintenance to convey water to the creeks, and channel and culvert improvements. This sub-watershed will continue to use the Casorso Marsh, with enhancement of the natural wetland, as a detention facility. Two potential detention sites in the eastern portion of the sub-watershed would only be necessary for additional development.

Swamp Road Sub-watershed: There is no well-defined watercourse draining this area. Drainage occurs through roadside ditches and ditching within the farmland. Growth of aquatic plants in drainage channels has restricted flow. Generally, ground water is within one meter of the surface in low lying areas and the area is a discharge area for lands to the east and south. The ground water conditions are unfavourable for development and, due to the large volumes, draining the ground water is not a practical solution. The pervious nature of the dike on Mission Creek further exacerbates the problem. An existing constructed wetland within the City land adjacent to Mission Creek at Gordon Drive requires permanent pumping with the need for a second permanent pump station. An existing diversion channel to Thomson Creek should be cleaned regularly and roadside ditches throughout the area should be improved as well. A potential detention site southeast of the Crawford / Dehart Road intersection would only be necessary for additional development.

The Basin Study recommends that the natural wetland in the Swamp Road area be retained and that filling be curtailed. In addition, the creation of a constructed detention facility within the adjoining Thomson Creek sub-watershed is recommended to handle water from the diversion.

Thomson Creek Sub-watershed: Thomson Creek discharges directly to Okanagan Lake and includes Crawford Estates drainage. Some filling has occurred adjacent to the channel. This area is also impacted by a high ground water table and is considered as part of the larger discharge area between Gordon Drive and Swamp Road. A new culvert under Dehart Road will be required as well as the above mentioned detention facility east of Gordon Drive to handle water from the existing diversion from the Swamp Road sub-watershed. Additional future development upstream in the Crawford area would likely require detention facilities near Crawford Estates.

Wilson Creek Sub-watershed: Wilson Creek also discharges directly to Okanagan Lake and the drainage is considered adequate for existing conditions, although aquatic growth reduces the capacity. Any additional development in the area east of Gordon Drive would require a constructed detention facility east of Gordon Drive.

All of the recommendations for these sub-watersheds assume no additional development, with the exception of infill development at Hall Road, McCulloch Road, and extension of development in Crawford Estates. Any additional development will likely require additional storm water detention facilities as noted. The individual Basin Management Plans and/or Drainage Study area documents should be referred to for more detailed information.

Hydrogeological and Geotechnical Assessment

A Hydrogeological and Geotechnical Assessment for Stormwater Management and Planning was undertaken for the City of Kelowna by EBA Engineering Consultants Ltd. December 1997). The primary purpose of the assessment was to characterize geotechnical and hydrogeological conditions within the City boundaries and to provide interpretations of these conditions for planning and management of storm water disposal by the method of ground water recharge.

This draft study documents ground water conditions throughout Kelowna in terms of recharge, transmission zone, and discharge areas. Recharge areas are generally at higher elevations with a greater depth to the water table and a downward ground water flow direction. Transmission zone areas are generally sloped areas between recharge and discharge areas, with a variable depth to the water table and a lateral ground water flow direction. Discharge areas are generally at lower elevations with a shallow depth to the water table and an upward ground water flow direction. A shallow depth to the water table limits the available area, or unsaturated thickness, for ground water disposal or absorption. Ground water may discharge to the surface at springs or evaporate quickly, creating salt deposits or elevated salinity levels in the soil. In addition, ground water flows may be local, with a residence time of days or months, or regional, with a residence time of several thousand years.

Generally, ground water flows southward down the main valley and westward from slopes east of the City to a large discharge zone adjacent to Okanagan Lake extending southward from the downtown area.

Based on factors of soil type, depth to ground water, and surface slope the City was divided into three classifications of suitability for ground water disposal. Some 28 % of the City was considered well suited, 18 % was considered moderately suited, and 54 % was considered as limited suitability. The well suited areas are located in the Capri area south to KLO Road, the Orchard Park area to south and central Rutland, portions of the Black Mountain, Belgo and Rutland Bench areas, portions of Southeast Kelowna, and along Highway 97 in the Airport and Ellison Lake areas. The moderately suited areas are located along Okanagan Lake from Knox Mountain to Bellvue Creek and over to Benvoulin Road and Mission Creek, eastern portions of Southeast Kelowna and portions of Black Mountain and east Rutland. Areas of limited suitability are located in the northern portion of the Glenmore Valley, North and South McKinley, University South, Dilworth Mountain, North Rutland, and along the upper reaches of Mission Creek.

ISSUES, OBJECTIVES, AND POLICIES

LEGISLATION

Legislative Issues

- Farm Practices Protection (Right to Farm) Act
- Agricultural Land Commission Act
 - Orders: Bed and Breakfast
Farm Retail Sales
Home Occupations
 - Policies: Agri-Tourist Accommodation
Home Site Severance
Parcels Less Than .8 hectares (2 Acres)
Secondary Suites
- Growth Strategies Act
- Official Community Plan
- Zoning Bylaw
- Non - Active Farm / Residential Fruit Tree Pest Control Bylaw

Farm Practices Protection (Right to Farm) Act

The Farm Practices Protection (Right to Farm) Act, passed in April 1996, supports farmers' rights to farm in the Agricultural Land Reserve, and in areas outside the ALR zoned for agriculture, provided the farm operation follows normal farm practices and legislation in the Waste Management Act, Pesticide Control Act, and Health Act. In addition, there were consequential amendments to the Municipal Act and the Land Title Act in support of the Farm Practices Protection (Right to Farm) Act.

Some non-farm or farm residents may have concerns about the noise, dust, odour, or other farm disturbances that are generated by an operating farm. The Act provides for a complaint process. Poor farming practices are not protected under the Act.

The Act also protects farmers from breach of municipal bylaws created under the Municipal Act regarding the keeping of animals, animal nuisances, noise control, nuisance and disturbances, burning, firearms, pest, noxious weeds, unsightly premises, unwholesome or noxious material, and odours arising from conducting a normal farm operation. Breach of such bylaws on farm property when not related to the normal operation of the farm, as defined in the Act, would be subject to the enforcement procedures of municipal bylaws.

The City of Kelowna acknowledges the direction of the Farm Practices Protection (Right to Farm) Act, recognizing that agriculture is a fundamental and positive activity, to be encouraged in healthy co-existence with the urban component of Kelowna. The community at large needs to assist in contributing to a positive environment for farmers to conduct business.

Agricultural Land Commission Act - Orders and Policies

The Agricultural Land Commission Act was passed in the Legislature in 1973 with the mandate of preserving agricultural land as defined by the ALR, encouraging farming, and ensuring that land uses within the ALR are compatible with agriculture.

Decision making with respect to land use and subdivision within the ALR, as well as the extent of the ALR, are administered by the Agricultural Land Commission (ALC). As part of this mandate the ALC has adopted numerous orders, policies, and regulations to clarify the appeal process. The most significant issues from Kelowna's perspective are:

Bed and Breakfast

The Agricultural Land Commission recognizes that modest bed and breakfast uses within a dwelling on farm properties have little or no impact on farm operations, and could provide an alternate source of income. In October of 1993, the Commission passed an Order of General Application that permits bed and breakfast uses, for a maximum of 3 bedrooms, within the ALR subject to one establishment per parcel within an owner-occupied dwelling.

Currently, the City's Zoning Bylaw allows bed and breakfast uses in owner occupied single family dwellings, including those in agricultural zones. However, the maximum number of bedrooms permitted is 4 in residential zones, while the Land Commission Certificate of General Order #1157/93 allows only 3 units within the ALR. In the interest of providing increased opportunity for additional farm income it would be appropriate for the City to investigate any unique circumstances that would justify a request to the Land Commission to consider a local variance to Certificate of General Order #1157/93, to increase the maximum number of bedrooms to 4, for lands within the ALR.

Farm Retail Sales

For some time the use of agricultural land to sell products grown or reared on that farm operation has been permitted within the ALR. In addition, it was possible to receive permission from the Land Commission to sell products not produced on site under Regulation 313/78. In recognizing that farm retail sales contribute to the productive use of farmland without interfering or prohibiting agriculture the Land Commission has acknowledged the traditional role of marketing of farm products, particularly in the Okanagan. The Land Commission has established a policy that encourages retail activity associated with the direct sale of farm products, processed farm products, and some off-farm products subject to that portion of the retail sales building used for the sale of off-farm products does not exceed one-third of the building floor area, up to a maximum of 100 square metres. In addition, where off-farm products are sold, farm products and processed farm products must also concurrently be offered for sale.

The Zoning Bylaw has recently been amended to allow farm retail sales as provided by the Land Commission Policy, including definitions of Farm Products, Farm Retail Sales, Off-Farm Products, and Processed Farm Products. However, the amount of floor space for sales of off-farm products has been restricted to 50 square metres. This limitation is due to concern expressed regarding the amount of floor space for off-farm retail sales with respect to the competition with other retail establishments throughout the City. Off-

farm sales may be perceived to have an unfair advantage, given the comparable tax rates, and retail lease rates, paid by merchants in urban commercial zones. On the other hand, farmers are faced with difficult economic conditions at this time, and a community objective to preserve farmland and farming activities is more difficult to achieve if the farmers are driven out of business.

In the interest of providing as much opportunity as possible for farmers to remain economically viable, the Zoning Bylaw should be amended to be consistent with Land Commission policy. The definition of Farm Retail Sales should be amended to provide for a maximum floor space of 100 square metres or one-third of the farm building, whichever is less, for the sale of off-farm products, consistent with the Land Commission Certificate of General Order # 293/95.

Home Occupations

The Agricultural Land Commission acknowledges that modest home occupation uses within a dwelling or accessory building on farm properties has little or no impact on farm operations. In November of 1995, the Commission passed an Order of General Application that permits home occupations, clearly secondary to the residential / farm use of the property, subject to the use being located within a residential or accessory building, a maximum floor area of 100 square metres, and not including day care, preschool, group homes or other care facilities.

Currently, the Zoning Bylaw allows home occupations in a manner consistent with the Land Commission Certificate of General Order #997/95, and the City should continue to support such uses in the interest of providing a source of additional income for farm families.

Agri-Tourism Accommodation

The Land Commission has established guidelines for use in their consideration of applications for small scale accommodation uses in conjunction with farming activities, in recognition of the growing trend for agri-tourism uses as a means to enhance farm income and contribute to the economic viability and stability of farming. Accommodation uses will require the approval of the Land Commission. When and if that approval is granted, the use would still be subject to local regulations and bylaws.

Currently, the Zoning bylaw does not allow accommodation uses, except lodgers within the farm dwelling, or bed and breakfast operations. The Zoning Bylaw would require amendment to allow agri-tourist accommodation uses such as guest ranches, farm inns, and campsites in conjunction with a bona fide agricultural operation and consistent with conditions under the Land Commission Policy #375/97.

Homesite Severance

The Land Commission has established a policy to accommodate a farmer who wishes to dispose of the farm but retain a homesite on the land, in the interest of providing a consistent approach to such situations. The policy does not confer a right, but provides conditions under which an application to the Land Commission would be considered. The policy is applicable to land where the principal residence of the applicant has been owner-occupied since December 21, 1972.

Given the limiting conditions of ownership since 1972 this policy will likely be applicable only in retirement situations. The City of Kelowna should continue to support the concept of home site severance consistent with Land Commission Policy #025/78, to allow farmers to retire or sell the property and retain the homesite, and thereby make the balance of the property available for others to expand or enter the farm business.

An additional consideration may occur when the homesite in question is considered a heritage resource. It may be appropriate to consider additional site area for the heritage homesite severance in order to retain some semblance of the original stature and presence of the building in the farm context. The Land Commission could be requested to consider increased parcel sizes for home site severance's involving a heritage resource to preserve the agricultural character of the setting.

Parcels Less Than .8 hectares (2 Acres)

Section 19 (1) of the Land Commission Act exempts lands less than .8 hectares (2 acres), by separate title prior to December 21, 1972, from restrictions on the use of agricultural land. In addition, a Certificate of General Order issued in February 1974 provides a partial exemption for parcels less than .8 hectares created after December 21, 1972. Lands less than .8 hectares are still subject to Land Commission Act regulations regarding subdivision within and exclusion from the Land Reserve. These lands are still subject to all local legislation, bylaws, and regulations; however, it is within the City's mandate to consider the zoning and non-farm use of these lots.

An inventory of existing lots less than .8 hectares within the City of Kelowna indicates that there are a relatively small number of sites, approximately 350 outside of conventional urban subdivisions, with no particular geographic concentration. In fact, most of the existing sites are located within well-established agricultural areas, some of which will have been created under the Homesite Severance provisions. There are some sites near or adjacent to established urban areas, and in some cases act as a buffer from larger agricultural holdings. However, these lots are still in an agricultural context.

The non-farm use of these properties would likely have an impact on the adjacent agricultural operations. New residential or commercial development will generate greater potential for conflict. In addition, this type of development leads to greater speculation on other agricultural lands in the vicinity and reduces the viability of continuing agricultural activity. Given the potential impact on agricultural operations and expectations it would be appropriate for the City, as a general principle, to discourage non-farm use of lands less than 2 acres in an agricultural context.

Secondary Suites

City Council has recently approved a secondary suite strategy that would seek to encourage the legalization of secondary suites throughout the City and implement policies that would make it easier to develop a secondary suite as an affordable housing alternative in all areas of the City, including agricultural areas.

There are a number of positive impacts of allowing secondary suites in rural areas. There would be equitable treatment for all existing residences throughout the City. A secondary suite may provide some income or mortgage assistance for farmers. A secondary suite

would not directly impact the operational side of a farm if no new land were removed from production to add the unit. Units necessary for additional farm help may be provided in this way rather than providing separate units that would use productive land base and require additional septic systems.

Conversely, there is a general lack of available services in rural areas, and rural locations require a vehicle which increases the traffic on a substandard rural road network, and additional traffic increases potential automobile / farm vehicle conflict.

Secondary suites may not be a big issue given that the ALC already supports bed and breakfast, agri-tourist accommodation, farm worker accommodation, farm retail sales etc. In addition, the current Zoning bylaw allows a maximum of two boarders and lodgers in any single-family residence. As this issue may apply in all other jurisdictions throughout the Province the ALC has recently approved Policy # 770/98 which allows one suite per parcel, substantially within the footprint of an existing or proposed single family dwelling provided it is clearly secondary to the dwelling.

It is suggested that support for the general principle of secondary suites in rural / agricultural areas would be reasonable, subject to permitting one suite per parcel, either in the existing or new principal single family dwelling as per Land Commission Policy #770/98. The location of a suite in an accessory building or enlarging the footprint of an existing residence to accommodate a suite would require the approval of the Land Commission.

Growth Strategies Act

In June 1995 the Municipal Act was amended to provide for the preparation of a Regional Growth Strategy for the purpose of promoting human settlement that is socially, economically, and environmentally healthy and that makes efficient use of public facilities and services, land and other resources. A Regional Growth Strategy should work toward, among other things; maintaining the integrity of a secure and productive resource base, including the agriculture and forest land reserves [Section 849.(2)(e)].

The Central Okanagan Regional District (CORD) has commenced work on a Regional Growth Strategy, however, as that project is not yet complete, there is no official policy with which local Official Community Plans or other similar documents must be in compliance.

The spirit and intent of the City of Kelowna Agriculture Plan is one of maintaining the resource base, as embodied in the Agricultural Land Reserve, and enhancing the agriculture industry with the municipal mandate. However, it would be appropriate to reconsider this document in the context of a Regional Growth Strategy when that initiative has been completed, adopted by the Regional Board and accepted by local governments.

Official Community Plan

Recent amendments to the Municipal Act have provided authority for municipal governments to consider policy statements in Official Community Plans respecting the maintenance and enhancement of farming on land in a farming area or in an area designated for agricultural use in the Community Plan [Section 878. (1)(c)]. A community plan may designate permit areas for the protection of farming [Section 879. (1)(c)]. Where land has been designated as a development permit area under Section 879. (1)(c) that development permit may include requirements for screening, landscaping, fencing and siting of buildings or structures, in order to provide for the buffering or separation of development from farming on adjoining or reasonably adjacent land [Section 920. (10)]. In addition, a local government may, with the approval of the minister, make bylaws in relation to farming areas respecting the conduct of farm operations [Section 917. (1)].

One of the primary issues with respect to protection of farmland and farming in Kelowna relates to the impact of existing and future development on existing agricultural operations and the need to provide effective buffers. A major objective of this document is to establish an urban-rural boundary that limits the encroachment of urban development into farm areas, and where new development does occur to create sufficient buffers to reduce or eliminate potential conflict. However, it must be recognized that much of the conflict that occurs today is the result of existing development that cannot be altered, and that creating development permit areas for the protection of farming may have little impact and create additional bureaucracy. Urban-rural boundary and buffering issues are discussed in a later chapter and it is felt that resulting policies, including bonding to ensure compliance with any landscape buffer and fencing requirements, will establish the City of Kelowna's method to reduce conflict and protect farming. Formal development permit areas for the protection of farming should not be pursued at this time.

Zoning Bylaw

Intensive Agriculture

The Municipal Act [Section 915. (2)] provides for intensive agriculture as a permitted use if land is located in the Agricultural Land Reserve. No local government has the power to enact a bylaw that prohibits the use of land for any farm business unless the local government receives the approval of the minister responsible for the administration of the Farm Practices Protection (Right to Farm) Act, following enactment by Cabinet of a regulation specific to that local government.

Currently, the City of Kelowna Zoning Bylaw has a separate zone for intensive agriculture uses that would be considered unenforceable under the Municipal Act, Agricultural Land Commission Act, and the Farm Practices Protection (Right to Farm) Act. Within the City there are very few operations that are considered as intensive agriculture and several existing sites are non-conforming with current zoning. The existing intensive agriculture uses pre-date the current zoning bylaw and, therefore, are legal non-conforming uses. As such, they may continue in their present location as long as the use is not discontinued for a period of six (6) months.

The Municipal Act defines intensive agriculture as the confinement of poultry, livestock, or fur bearing animals and the growing of mushrooms. The confinement of poultry, livestock, or fur bearing animals is of concern due to the odour and insects associated with animal waste (manure) and storage. In addition, potential farm operations such as on-farm composting and compost storage before use or sale are of concern. Mushroom growing operations also have similar issues with the storage of compost prior to use or storage of manure prior to composting, although they may be somewhat reduced if the mushroom growing medium is purchased rather than composted on site. There would be the added concern regarding the storage of used compost prior to sale.

The objective is the protection of urban uses from the noxious odour and insect problems often associated with intensive agriculture uses. In addition, given the trend to increased agri-tourism uses such as bed and breakfast, direct farm marketing, orchard tours, winery tours, and tourist accommodation, it would be appropriate for the City to have the ability to control the location of intensive agriculture uses so that impacts on other farm operations do not arise. There are also other existing uses in rural areas, such as golf courses, that could be significantly affected by odour problems associated with intensive agriculture.

There are other methods such as setbacks, landscaped buffers, and minimum parcel size that can be incorporated into a zoning bylaw that may provide some level of control to reduce negative impacts. A separate Farm Bylaw could be used to establish specific criteria for allowing intensive agriculture uses, including designating specific areas where intensive agriculture would be prohibited or restricted. A requirement for rezoning would allow adjoining property owners, urban or rural, to participate in the decision making process through a public hearing, although the minister responsible for the administration of the FPPA has indicated that spot zoning for intensive agriculture is unlikely to be approved.

The City should commit to continue a process to address the scope and methods of addressing intensive agriculture to the satisfaction of the City, the Agricultural Land Commission, and the Ministry of Agriculture and Food, before seeking the approval of the Minister responsible for the administration of the Farm Practices Protection (Right to Farm) Act for any bylaw addressing intensive agriculture. It may also be appropriate to ensure that the definition of intensive agriculture does not include normal farm practices that might be considered as objectionable by some now or in the future.

Parcel Size

As discussed earlier, work done on behalf of the Okanagan Valley Tree Fruit Authority indicates an average size of a commercial orchard as being 8.0 ha (20 acres). The Ministry of Agriculture and Food has suggested parcel sizes for various commodities ranging from 2.0 ha (5 acres) for vegetables and berries, up to 8.0 ha (20 acres) for tree fruits, as minimum farm unit sizes.

Previous City of Kelowna consideration of a potential increase in the minimum parcel size throughout the agricultural community was met with a strong negative reaction on the part of farmers. Farmers felt that their economic livelihood was already strained and that further property restrictions were inappropriate. Consequently, the minimum parcel size in the general agricultural zone was left at 2.0 hectares (5 acres).

Another impact of smaller parcel sizes relates to the non-ALR rural land areas beyond the ALR on the periphery of the City. Development in these peripheral areas may have some impact on ALR lands and farming operations due to the need for access and to provide services to development in outlying areas. Increased utility and road corridors, plus increased traffic on existing corridors will result, impacting the ability of farmers to operate.

Some peripheral areas are future urban reserve areas, and lot patterns and road corridors necessary for development to 2.0 ha parcels may create difficulty in further urban densification in the future. Although 2.0 ha parcels may create difficulties; these rural lots may also reduce the pressure for similar sized lots within productive agricultural areas.

Consideration for an increase in lot sizes for lands outside the ALR to restrict development for future urban densification reasons, as well as containing sprawl, has been discussed in the past and may be appropriate. However, it is very likely that property owners will also feel that their rights are being compromised, and will resist initiatives to change the minimum parcel size. An increase in minimum parcel sizes in agricultural zones may not be appropriate at this time.

Additional Residences for Farm Help

Discussion and new policy to be based on forthcoming research by the Ministry of Agriculture and Food.

Non - Active Farm / Residential Fruit Tree Pest Control Bylaws

Tree fruit growers and other farmers strive to produce the highest quality possible in order to retain market share and optimize prices. To that end, commercial farm operations are very conscious of disease and pest control within their own businesses. In addition, there are other programs such as the Sterile Insect Release program to eradicate the Coddling Moth.

All of these efforts can be undermined if some farm operations or residential trees are not properly maintained. In particular, the issue of farms that, for whatever reason, are no longer active and are not properly attended may allow diseases and pests to flourish, with negative impact on adjoining farm businesses. There needs to be a control mechanism that requires inactive farms to be maintained or have the trees or other vegetation removed so that impacts on other operations are minimized. Active farms and organic operations would not be affected.

The issue is also one that knows no borders, and farm operations on a regional basis are subject to impacts of this nature. The City of Kelowna, in conjunction with the Central Okanagan Regional District, should investigate and pursue the establishment of a Non - Active Farm Bylaw to require maintenance or removal of trees and other vegetation on inactive farm operations. The administration of the bylaw, similar to other bylaws such as animal nuisances, noise control, burning, noxious weeds, and unsightly premises, could be through the Central Okanagan Regional District.

The issue of disease and pests in residential fruit trees is similar except that there is an enforcement problem. One of the attractions for people choosing to live in the Okanagan is the ability to have fruit trees in their backyards. These trees need to be maintained in a similar fashion to commercial orchards or the problem of diseases and pests will be impossible to control and efforts by farmers may be undermined. At the very least, the City and Regional District should consider educational programs directed at residential property owners regarding the importance and methods of fruit tree maintenance. It may also be appropriate to investigate the potential for inclusion of this issue as part of a Non - Active Orchard Bylaw, if enforcement concerns can be resolved.

Legislative Objectives

- To harmonize local bylaws and policies, respecting agricultural interests, with Provincial legislation.
- To consider local variations with respect to the Official Community Plan, Zoning and other Bylaws, where appropriate, toward agricultural enhancement.

Legislative Policies

The City of Kelowna will:

1. **Farm Practices Protection (Right to Farm) Act.** Support the provisions of the Farm Practices Protection (Right to Farm) Act, and consequential amendments to the Municipal Act and the Land Title Act, in the interest of contributing to a positive environment for farmers to conduct business;

2. **Bylaw Enforcement.** Continue to enforce local bylaws when nuisances, disturbances, or other breaches of bylaws are not related to the normal operation of a farm, as defined by the Farm Practices Protection (Right to Farm) Act;
3. **Bed and Breakfast.** Investigate any unique circumstances that would justify a request to the Land Commission to consider a local variance to Certificate of General Order #1157/93, to increase the maximum number of bedrooms to 4, for lands within the ALR, in the interest of providing an opportunity for additional farm income;
4. **Farm Retail Sales.** Pursue an amendment to the Zoning Bylaw to include a maximum floor space of 100 square metres or one third of the of the farm building, whichever is less, for the sale of off-farm products, consistent with Land Commission Certificate of General Order #263/95;
5. **Home Occupations.** Continue to support home occupations, as a source of additional income for farmers, consistent with Land Commission Certificate of General Order #997/95;
6. **Agri-tourist Accommodation.** Pursue an amendment to the Zoning Bylaw to include agri-tourist accommodation uses in conjunction with bona fide agricultural operation, consistent with conditions under the Land Commission Policy #375/97;
7. **Homesite Severance.** Continue to support the concept of homesite severance, consistent with Land Commission Policy #025/78;
8. **Heritage Resources.** Request the Land Commission to consider increased parcel sizes for home site severance involving a heritage resource, to preserve the agricultural character of the setting;
9. **Parcels Less Than .8 Hectares (2 Acres).** Discourage the non-farm use of parcels less than .8 hectares where such parcels are located in an agricultural area;
10. **Secondary Suites.** Support the provision of secondary suites in agricultural areas as per Land Commission Policy # 770/98, which allows one suite per parcel, substantially within the footprint of an existing or proposed single family dwelling provided it is clearly secondary to the single family dwelling. Suites in accessory buildings or enlarging the footprint of an existing residence for a suite would require an ALC application;
11. **Regional Growth Strategy.** Review the Agriculture Plan for consistency with the Regional Growth Strategy when that initiative has been approved by the Central Okanagan Regional District and accepted by local governments;
12. **Farm Development Permit Areas.** Not pursue amendments to the Official Community Plan regarding the establishment of development permit areas for the protection of farming, at this time, in favour of implementing buffer, fencing, and landscaping requirements through the Zoning Bylaw;

13. **Intensive Agriculture.** Commit to continue a process to address the scope and methods of addressing intensive agriculture to the satisfaction of the City, the Agricultural Land Commission, and the Ministry of Agriculture and Food, before seeking the approval of the Minister responsible for the administration of the Farm Practices Protection (Right to Farm) Act;
14. **Definition.** Support a definition of intensive agriculture in the Zoning Bylaw that does not include normal farm practices that might be considered as objectionable by some, now or in the future;
15. **Parcel Size.** Not pursue amendments to the Zoning Bylaw regarding an increase in the minimum parcel size for the general agricultural zone, at this time;
16. **Additional Residences for Farm Help.** (New policy will be based on forthcoming data from Ministry of Agriculture and Food).
17. **Non - Active Farms.** Investigate and pursue, in conjunction with the Central Okanagan Regional District, the establishment of a non - active farm bylaw to promote increased maintenance and pest control in farm areas, except for active orchards and organic operations, including potential application for residential fruit trees maintenance, with administration of the Bylaw by the Regional District;
18. **Residential Fruit Trees.** Pursue, in conjunction with the Central Okanagan Regional District, the creation of educational programs and brochures regarding the importance and methods of fruit tree maintenance in residential areas.



ENVIRONMENT

Environmental Issues

- Use of pesticides
- Livestock impact on water quality
- Watershed stewardship
- Wetland preservation
- Drainage impacts from lack of dredging
- Wildlife corridors
- Air quality due to burning

Pesticides

Spray schedules from the 1996-97 Tree Fruit Production Guide and the Grape Management Guide for Commercial Growers are only intended to provide a generalized reference to the types of sprays that may be used at various times of the year. Detailed consultations with crop experts are recommended before any spray is applied. Spray schedules change from time to time to reflect the kinds of insect or disease pressure that may occur. Only a few of the products available are actually used in an average year in the Kelowna area.

There may be a public perception that there is a problem, however, that may relate more to the nuisance factor for adjacent residential development. Certainly there are products used that have varying degrees of toxicity at the time of application. Some products used are for nutrition and are not harmful, yet the public perception is that anything sprayed in agricultural operations is harmful. The establishment of some educational pamphlets that outline the types of products used, time of year, and toxicity may be appropriate to help diffuse some of the negative connotation of living near agricultural operations in terms of impact on air and water quality. The public should also be made aware that farmers are required to have an Applicators License in order to use fertilizers and pesticides. Perhaps a coordinated effort to produce educational brochures, in conjunction with the Central Okanagan Agricultural Awareness Society, CORD, MAF, and BCFGA, would be appropriate.

Water Quality

The Ministry of Environment, Lands, and Parks (MELP) discontinued water quality testing of local watercourses in 1990. The City of Kelowna started a sampling program in 1992, which suggests no clear improvements or degradation in local streams to date. Agriculture may be a smaller contributor of non-point source pollution than other uses such as forestry, septic fields, or other urban runoff sources. Water may not contain detectable quantities of pollutants for any number of reasons; however, testing of sediment may provide information on cumulative impacts that would assist in identifying point and non-point source pollution. The monitoring of water quality is an expensive proposition, and other jurisdictions, in addition to the City of Kelowna, have an on-going interest in ensuring that water quality is maintained. It is suggested that the Ministry of

Environment, Lands, and Parks be encouraged to resume this function in the interest of all other agencies and jurisdictions.

Watershed Stewardship

The location of small-scale livestock operations or more intensive operations such as feedlots in proximity to watercourses is a potential source of water quality impacts. Material that is decomposing (manure) uses oxygen in the process and if this occurs in wetlands and watercourses the oxygen in the water is depleted, with potential impacts on fish habitat. All operations of this nature are encouraged to adhere to the Code of Agricultural Practice for Waste Management; however, there is no enforcement except through the Waste Management Act.

A publication by the Provincial government as part of the Stewardship Series entitled "Watershed Stewardship: A Guide For Agriculture" outlines best management practices, in tune with the Code of Agricultural Practice for Waste Management. This publication provides guidance on stream corridor / wetland protection, prevention of pollution, and habitat protection / restoration through site planning, waste management, pest management, irrigation and drainage management. General standards of 15 m to 30 m setbacks from watercourses or water sources for confined livestock areas, manure storage structures, and storage sites for fuel products, or fertilizers and pesticides, are suggested. In addition, livestock access to watercourses should be limited and surface runoff should be directed away from sources of contamination.

Educational opportunities for farmers to improve their operations with respect to watershed protection could be encouraged by MAF, in conjunction with the City Watershed Educators. In addition, the City of Kelowna Zoning Bylaw could consider environmental protection issues in rural zones regarding building siting for farm operations involving livestock, storage of manure, fertilizers and pesticides.

Wetlands

There are several wetland areas throughout Kelowna, associated primarily with existing stream corridors. Wetland areas tend to be located in low areas that also have potential for agriculture, although somewhat reduced due to wet conditions and occasional flooding. Not only do these areas represent hazards to other uses due to potential flooding; they are in turn, sensitive to impacts from other uses involving urban encroachment, recreational use, pesticides, fertilizers, and animal husbandry. In addition, watercourses and wetlands represent other values from a fish and wildlife habitat perspective that need to be protected.

There are a number of stream corridors, as identified in the OCP, where there are City public access and protection objectives. It must be remembered that such access should be accomplished in a manner sensitive to the riparian zone and the needs of the agricultural community in terms of their ability to continue to operate their farm businesses. Public access along stream corridors adjacent to agricultural operations may provide additional opportunities for education and experience of the farm lifestyle.

While wetlands may create potential flooding problems in the immediate area of the wetland, they also act as retention facilities that prevent downstream flooding. Areas of bog or peat have large subsurface storage capacity. In addition, the settling and filtering process that occurs in wetlands does contribute to overall water quality. Where wetlands occur in the vicinity of urban areas they can act as a natural buffer between urban and rural uses.

The City of Kelowna is currently preparing a Wetland Habitat Management Strategy that will identify wetland areas and recommend management strategies. The Agriculture Plan should be amended according to suggested management strategies, where appropriate, recognizing that where these wetlands occur in agricultural areas there needs to be a balance between the rights of the farmer to operate and their responsibility to operate in an environmentally sensitive manner.

Drainage

Some of the wetland conditions present in the Benvoulin Road area and the Swamp Road area may be attributable to the lack of dredging in Mission Creek, lack of ditch maintenance throughout the general area, and recent unusually wet years. A dry cycle may reduce the wet conditions.

It is recognized that over the years the level of Mission Creek bed has risen so that the water level is higher, at times, than the surrounding land outside the dike. That fact, in conjunction with the fact that the existing dike is constructed from porous material originally dredged from the Creek, may contribute to the wet conditions in the area.

However, it must also be recognized that these areas are flat lands in proximity to Okanagan Lake and that water tables will tend to be higher regardless of Mission Creek levels. Information from a recent Hydrogeological and Geotechnical Assessment conducted for City indicates that ground water contours converge into a discharge zone in the Swamp Road area.

Dredging of Mission Creek and increased maintenance levels in ditches will likely help reduce the impact of high water tables, but they in themselves may not be the whole solution. There should also be greater understanding and cooperation regarding ditch profile and vegetative cover to support appropriate drainage and water quality objectives.

An additional concern is that fish may have been found in some of the ditches in the area. Although the MELP has not inventoried the area, and these ditches are not formally classified as "fish bearing", it is their opinion that if fish are present then the ditch is fish bearing and the Federal Fisheries Act applies.

Wildlife Corridors

Within the City of Kelowna there are several areas that might be considered as wildlife corridors, primarily watercourses such as Mission, Mill (Kelowna), Bellvue, Priest, KLO, and Gopher Creeks. Other areas could include the Glenmore Highlands area, the South Slopes, or the East Rutland Bench area.

Although the OCP seeks the preservation of most of these watercourses as natural areas for habitat protection (primarily bird and fish habitat), many are also desirable as public access corridors. Community and environmental needs should also be balanced with the rights of property owners and in particular, agricultural operations within proximity to these selected stream corridors.

It is unlikely that significant wildlife movement for larger ungulates would occur in areas where there is considerable human activity. Wildlife corridors for terrestrial mammal movement would require the preservation of corridors in the range of 1 km in width. Corridors of this width do not currently exist within the agricultural areas of Kelowna, and it is unlikely that such corridors will be created.

More significant wildlife corridors are located outside the City of Kelowna boundaries, through Regional District jurisdiction adjacent to the City, some of which is Crown land. Concern has been expressed by members of the agriculture community that impacts from logging and development pressure on summer / winter pastures has forced wildlife into non-traditional areas, with resulting impacts on farm operations. Wildlife movement through agricultural areas increases damage to fruit trees and to forage crops. The City of Kelowna should encourage the Central Okanagan Regional District to consider the impacts on wildlife corridors when development proposals are brought forward. In addition, Ministry of Forests should be encouraged to maintain wildlife corridors through logging areas so that these animals are not forced to use agricultural areas.

Air Quality

The issue of air quality is a regional issue that has come to the forefront due to the prevailing conditions within the Okanagan Valley. Climatic conditions frequently create inversions that trap warmer air underneath colder air. A prolonged time frame for this occurrence means that emissions from many sources (industry, automobiles, wood burning fireplaces, open fires for orchard prunings or forestry burns) cannot escape from the valley, creating days where air quality is considered poor, especially for those individuals with respiratory problems. Currently, a permit is required for the burning of orchard waste, with appropriate conditions and timing, with the permit good for one month. The window in which burning is permitted is a six month time frame from October 15 to April 15. Extensions may be considered in particularly wet seasons. Individual extensions are considered on an application basis. The concern has been expressed by farmers that the allotted time frame does not allow sufficient time after snowmelt. Given that annual pruning is usually done in the winter, there may be nothing to burn for the first few months of the time window. It has been suggested that the time frame should be shifted toward the spring or extended to allow sufficient opportunity for farmers to burn. An extended burning window could also diffuse the impact of burning on any given day by not forcing farmers to all burn at the same time.

The point source contribution analysis for air quality impact is not detailed enough to determine the impact of farm / rural burning on air quality. More detailed modeling is needed, with detailed inputs on volumes being burned or emissions from other sources, to identify contribution levels. Any air quality study directed at improvements must consider the other sources. In addition, any regulations would need to be applied in a consistent manner throughout the Region.

From the perspective of the farm community, and the Farm Practices Protection (Right to Farm) Act, the burning of prunings is a farm practice that has always been used and would be considered "normal" within the context of orchard management. In addition, under the Waste Management Act, farm burning is exempt. There are some environmental stewardship issues that should be considered, however, the economic impact on farm operations, if burning were to be restricted, must be considered after a point source contribution analysis to determine the level of rural / farm burning contribution.

The Ministry of Agriculture and Food advises that most growers chip their prunings by using mowers and that the primary source of material to burn is from stumps generated during replanting, however, stumps must be stockpiled for two years prior to disposal by burning. The replant program administered by the OVTFA is likely to end by the year 2000, unless further initiatives are established. Conceivably, the level of rural burning attributable to agricultural activity will be reduced in the near future.

The obvious solution to reduce burning impact on air quality is to find an alternative to burning, however, such an alternative should be economically viable so that farmers are not impacted and thereby choose to burn as the only affordable alternative. Chipping pruning waste is an alternative that has merit, as long as the farmers are not forced to transport the waste to a specified location and are not charged a fee for the service. Perhaps the establishment of a mobile chipping business could be investigated, with the business supported by fees from the sale of the wood waste, rather than charging the farmer a service fee.

Another potential solution lies in the education, of any farm operator, business, or industry that burns, on the impact of burning and the encouragement or requirement to burn only on days when the venting index would support open burning.

Environmental Objectives

- To educate the public and farm operators on the impact of pesticide and fertilizer use.
- To monitor and maintain water quality in local watercourses and Okanagan Lake.
- To protect against further water quality impacts from intensive agricultural uses.
- To consider stream corridor wetland habitat protection and public access in a manner sensitive to the needs of the agricultural community.
- To reduce wildlife impacts on farm operations.
- To reduce burning impact on air quality.

Environmental Policies

The City of Kelowna will:

1. **Educational Brochures.** Encourage and support a coordinated effort to produce educational brochures on pesticide and fertilizer uses and their impact on adjacent residential area in conjunction with the Central Okanagan Agricultural Awareness Society, CORD, MAF, and BCFGA;
2. **Water Quality Monitoring.** Encourage the Ministry of Environment, Lands, and Parks to resume water quality testing and monitoring functions in the interest of all other agencies and jurisdictions;
3. **Wetland/Stream Protection.** Encourage the Ministry of Agriculture and Food, in conjunction City Watershed Educators, to provide educational opportunities for local farmers to become proactive with regard to watershed protection and habitat stewardship in tune with the Code of Agricultural Practice for Waste Management;
4. **Intensive Agriculture Zoning.** Consider a separate zone under the Zoning Bylaw for intensive agriculture uses that supports local control over location and setback requirements for livestock operations as outlined in the Watershed Stewardship publication of “A Guide for Agriculture”;
5. **Public Access Corridors.** Continue to seek habitat protection and public access along stream corridors, as identified in the OCP, in a manner sensitive to the riparian zone and the needs of the agricultural community;
6. **Wetland Buffers.** Support the retention and use of wetlands near urban areas as natural buffers between urban and rural uses;
7. **Wetland Habitat Management Strategy.** Amend this document, where appropriate in an agricultural context, based on recommended management strategies of the Wetland Habitat Management Strategy;
8. **Wildlife Corridors.** Encourage the Central Okanagan Regional District and the Ministry of Forests to consider the impacts of rural development and logging operations, respectively, on wildlife corridors and maintain appropriate corridors to avoid agricultural impacts;
9. **Ditch Maintenance.** Encourage the Ministry of Transportation and Highways and the City to work with the agricultural community to improve flow and ditch conditions in the Benvoulin / Mission Creek / Swamp Road area, incorporating a mutual understanding of drainage and water quality objectives, toward the ability to maximize flows and a reduction of wet conditions on adjoining agricultural lands;
10. **Air Quality Monitoring and Regulations.** Encourage the Federal Government, Ministry of Environment, Lands, and Parks, and the Central Okanagan Regional Air Quality Committee to pursue more detailed modeling of air quality to determine

point source contribution levels, toward the establishment of regulations for burning impacts on air quality, to be applied in a consistent manner throughout the Region;

11. **Mobile Chipping.** Encourage the establishment of private mobile chipping businesses, to provide an option to farmers instead of burning orchard waste;
12. **Venting Index.** Investigate, in conjunction with the Central Okanagan Regional Air Quality Committee, methods to advise the farming community of times when burning would be appropriate or not appropriate, based on a venting index, and consider a shift toward the spring or an extension to the current burning window to provide farmers sufficient time after snow melt and reduce the potential impact of burning on any given day.



TRANSPORTATION

Transportation Issues

- Road ends abutting agricultural land
- Road maintenance levels
- Road standards
- Corridors to service growth
- Grid Road Network
- Signage
- Recreational activities

Road Access

The value placed on the land by speculation as potential future development land far outweighs its value as productive agricultural land. Higher land prices make the assembly of economic orchard units difficult and increases the speculation on the urban-rural fringe. One of the ways in which land is perceived as future development land is through the establishment of roads (i.e. road ends or half roads) needed to service urban development adjacent to or butting into agricultural land. The message is that the next property is holding land for future development. In order to send a different message this requirement needs to be reconsidered when urban developments are approved.

Recent changes to the Land Title Act, [Section 86 (1) (x) and (xi)] regarding increased access to land in an agricultural land reserve, now provide the Approving Officer greater discretion when considering requirements for access that would impact lands designated or used for farming. An Approving Officer may refuse a subdivision if there would be unreasonable interference with farming operations due to lack of buffering or separation, or where the extent or location of highways would unreasonably or unnecessarily increase access to land in the ALR.

It is recognized that there will be occasions when the next property does become development land and that for the sake of continuity in the road network access must be preserved. However, there are methods where potential future access could be preserved while reducing potential impact on adjoining properties. Evaluation of proposals from an agricultural perspective is discussed in a publication by MAF entitled "Subdivision Near Agriculture: A Guide for Approving Officers".

The Approving Officer should be encouraged to consider the provision of buffers, by way of a restrictive covenant in favour of the City, of sufficient width between urban uses and agricultural land. The buffer would serve to reduce or eliminate conflict on the urban rural fringe while still preserving future access potential, without a road frontage sending the wrong message. Buffer widths should be established at standard road or half road widths where adjoining land is not designated for development in the OCP. The Approving Officer should also be encouraged to not require access to adjoining lands via road ends where lands are not designated for development in the OCP.

Road Maintenance

An issue that presents some difficulty for the farming community is that of the maintenance level on rural farm roads. Most of the roads in farming areas were created as rural standard roads under the jurisdiction of the Ministry of Transportation and Highways (MoTH). Currently those roads are maintained by contractors responsible to MoTH. The primary concern is that roads developed at a rural standard for farm use are increasingly being used by a growing urban community and recreational users, with resultant deterioration of roads not built to withstand the volumes of traffic or typical speeds. In addition, certain routes through agricultural areas may experience truck traffic associated with logging or gravel extraction or buses for farm tours that impact road conditions. A low level of maintenance over time has also contributed to the problem.

Currently some roads designated as part of the 20 Year Major Road Network Plan are identified for improvements from Development Cost Charges (Transportation Plan Figure 7.8), which are dependent on growth. All the other rural roads are maintained from a limited annual budget, which means there is a need to prioritize road maintenance. Priorities should be established firstly, on safety issues and secondly, the level of use, by traffic volume and type, including agricultural users.

Another issue with respect to road maintenance is the timing when improvements are undertaken. Typically, the most opportune time to do road maintenance is during the warm dry summer and fall seasons. Similarly, the busiest time for farmers is during the summer and fall harvest season when they will most likely be using the roads to transport equipment and crops. Another concern is the possible interruption to water service during construction or maintenance. Access to water is less critical in the spring and more critical from mid-May through to the fall. Once the priorities in terms of road maintenance are established it would also be appropriate to consider the timing of that work to be offset from busy times for various commodities or when assured access to water would be most critical. Typical harvest schedules are well documented.

Road Standards

Figures 7.20a and 7.20 of the Transportation Plan outline the 1995 and 2013 Road Classifications. The standards for right-of-way width, pavement width, and other needs such as parking, sidewalks, and boulevards are outlined in these classifications for arterial, collector, and local roads. These standards relate primarily to urban situations and may not always be applicable in a rural context. Currently, the City of Kelowna Subdivision Bylaw requires a pavement width of 7.3 m for rural local and collector roads, within a 20 metre right-of-way.

A 1994 study done for the Township of Langley entitled “Langley Township Country Roads: Identification and Maintenance Guidelines” outlines rural road standards based on the needs of the rural agricultural community as well as other road users. The standard pavement width is 6.0 m where there are less than 1000 vehicle trips per day and 6.7 m where there are between 1000 and 3000 vehicle trips per day. The minimum shoulder width is 1.5 m in all cases, with the potential for 2.0 m if equestrian activity is included. The width of hard surface of the shoulder varies depending on use (pedestrian / bikes / horses) and could be hard surface, gravel, grass, or a combination, depending on need. The pavement width plus the shoulder is considered sufficient width for farm vehicles /

equipment to pull to one side while leaving enough room for another vehicle to pass without compromising on coming traffic.

The City may need to consider a separate Rural Collector Road and a Rural Local Road classification and design standard as outlined in the above noted study, for inclusion in the Subdivision Bylaw. Figure 5.8 of the Transportation Plan identifies the proposed bikeway network for the City, including rural roads where improvements to the shoulders for bike traffic would be required. As part of the exercise, the Transportation Plan could also identify which corridors could be designated as pedestrian / bicycle / equestrian routes, in order to determine shoulder width required on specific roads.

Roads with over 3000 vehicle trips per day could still be considered as typical arterial or collector roads, with standards as prescribed in the Transportation Plan, as these roads are generally servicing residential growth areas rather than strictly rural or agricultural traffic.

The width of the right-of-way would still need to remain at 20 m, even with a reduced pavement width, due to the need to provide sight distance setbacks, shoulders for bike lanes, ditches, utility poles, and other utilities within the public corridor. Under the Land Title Act, upon subdivision of land the City of Kelowna can require a maximum of 20 m, without compensation. Any land required over the 20 m width would require a negotiated settlement with the property owner as well as approval of the Agricultural Land Commission.

It may be appropriate to consider the impact on specific farm operations to determine how road dedications will be attained through the subdivision process. With no impact on the farm operation the full dedication would be required and if the loss of land would impact the farm operation the City could take a road reserve, to be exercised at the time any road widening is necessary, based on safety or traffic volume issues.

For a home site severance or a simple lot line adjustment, the City should pursue only minimal road dedications. In the case of homesite severance, dedication should be on the severed portion only. Section 4 roads should be reviewed on a case by case basis. Ultimately, it must be remembered that the Approving Officer may require full dedication at the time of subdivision, based on the need to resolve safety issues.

Corridors to Service Growth

Roads designated as part of the 20 Year Major Road Network Plan have been identified in the 20 Year Servicing Plan, as the corridors necessary to service growth throughout the City of Kelowna. These roads will be improved as needed for development. In farm areas these roads are intended to become the more attractive routes for non farm traffic, which will leave the majority of other rural roads for uses associated with agricultural operations. It may also be appropriate to treat the roads intended as the major routes by increasing visibility with painted lines marking bike lanes or fog lines.

New growth areas within or beyond agricultural areas should be discouraged, as such growth nodes would require upgrading of existing roads or the construction of new roads that create greater property and traffic impacts, and conflict with agricultural activities and the environment.

Grid Road Network

The Kelowna Official Community Plan and Transportation Plan outline the 20 Year Major Road Network for the City. It must be recognized that this network is a projection of future needs based on projected growth within the 20 year planning horizon. Due to the uncertainty of long term future development there is a need to identify corridors for roads beyond the 20 year horizon.

The Ministry of Transportation and Highways, in conjunction with the City, is in the process of preparing a Major Street Network Plan that would identify long term road corridor needs. This process should ultimately be expanded to include CORD, Lake Country, and the Land Commission, to achieve a regional consensus on future road corridor protection on the east side of Lake Okanagan.

Signage

The issue of signage in rural areas, either as directional for farm businesses or cautionary due to farm activity, is significant, as any signs permitted would likely be within the public road right-of-way. There has been reluctance to approve signs for farm purposes because there are no National or Provincial standards for agricultural signage. Without standards there could be confusion with respect to intent of messages and/or competition that creates a proliferation of signs that interfere with highway signage necessary for directions or safety. The need to maintain visibility and clarity is especially important at intersections, where most accidents occur.

There are a number of circumstances that would benefit from the provision of standardized agricultural signage. Safety considerations that include hidden driveways, agricultural trucks turning, slow moving farm traffic, spray drift, and farm equipment crossings are all issues that could require signage. It may be appropriate for farmers to propose signage for specific sites that the City could consider based on safety needs. In this way the City could initiate research and development of a signage warrant policy.

Increased attention to landscape / ditch maintenance, within the right-of-way, in the vicinity of driveways, crossings, and sharp curves could reduce the conflict and need for signage. In addition, it would be appropriate for the farming community to ensure a proper level of landscape maintenance within private property to increase visibility at driveway or crossing locations. The need for signage may be reduced as a result.

There may also be an opportunity for additional signage that is educational in nature or business oriented, to be located at the urban / rural fringe. Such signage as "Agriculture in Progress" would send a warning that motorists are entering an agricultural area and that agricultural traffic (trucks, tractors, spray equipment) spray drift, livestock and equestrian activity should be expected. Signage at this interface, on private property, could also direct people to farm businesses that rely on visitors for part of the farm income.

Recreational Activities

A growing consideration throughout the community is the use of city roads in general for recreational activities such as bicycle or marathon road races. This issue is of particular concern where rural roads are utilized, due to the potential impact of conflict with farm traffic or normal farm practices such as spraying.

The agricultural community has not indicated that they feel these activities should be prohibited, recognizing that these roads are public facilities. The timely notification of intended events may allow farmers to modify or schedule their operations in a manner sensitive to the public use of existing road corridors. It would be appropriate for race organizers to establish a notification process (advertising, flyers, etc.) for agricultural properties that allow the agricultural community to respond to the potential impact of their operations on such activities. In addition, event organizers should be required to advise all participants of potential hazards when utilizing roads in a working agricultural area.

Transportation Objectives

- To support alternatives that reduce unnecessary road access in agricultural areas and reduce conflict on the urban / rural fringe.
- To promote an increased level of maintenance on rural roads to the benefit of the agricultural community.
- To formulate appropriate road standards for rural roads for non-vehicular users.
- To establish criteria on how road dedications will be attained in rural areas.
- To encourage non-farm traffic use of major roads rather than local rural roads.
- To support the protection of long term road network corridors.
- To support the development of agricultural signage only in circumstances that would provide potential safety benefits.

Transportation Policies

The City of Kelowna will:

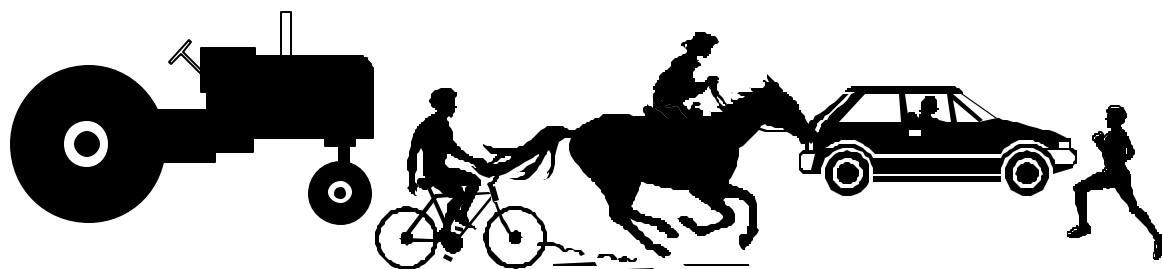
1. **Agricultural Buffers.** Encourage the Approving Officer to require buffers, under a restrictive covenant in favour of the City, adjacent to agricultural land in accord with the Ministry of Agriculture and Food publication "Subdivision Near Agriculture: A Guide for Approving Officers";
2. **Buffer Widths.** Require that buffer widths be established at standard road or half road widths where adjoining land is not designated for development in the OCP;
3. **Road Ends.** Encourage the Approving Officer to not require road ends abutting agricultural land where the land is not designated for development in the OCP;

4. **Road Maintenance Priority.** Encourage the Ministry of Transportation and Highways or the City, to establish rural road maintenance priorities based on safety issues and by traffic volume and type, including agricultural, logging, and gravel extraction traffic;
5. **Maintenance Schedule.** Encourage the Ministry of Transportation and Highways or the City, when establishing a schedule, to offset rural road maintenance from times when agricultural community needs regarding access to water are critical and from typical harvest schedules;
6. **Right-of-Way Width.** Retain the minimum 20 m right-of-way standard for all local rural roads;
7. **Rural Road Standards.** Consider amendments to the Transportation Plan to establish separate rural collector and rural local road classification and design standards, including consideration for pedestrian / bicycle / equestrian needs within the design standard, based on agricultural considerations, for inclusion in the Subdivision Bylaw;
8. **Equestrian Routes.** Consider the establishment of equestrian route mapping, on existing corridors, for inclusion in the Transportation Plan;
9. **Road Dedications.** Encourage the Approving Officer to consider the impact of road dedications on farm operations and establish dedication requirements that provide for:
 - full dedication where there is no impact on the farm operation;
 - road reserves where there is impact on the farm operation;
 - minimal dedications for home site severance or lot line adjustments,
 - dedications of Section 4 roads to be reviewed on a case by case basis,

recognizing that the Approving Officer may require full dedication at the time of subdivision, based on the need to resolve safety issues;

10. **Non-farm Traffic Routes.** Continue to use the 20 Year Servicing Plan as a guide to upgrade existing roads or construct identified new roads to service growth, as the preferred route for non-farm traffic;
11. **Identification.** Consider the use of painted lines for bike lanes / fog lines that identify major roads as the preferred route for non-farm traffic;
12. **New Growth Areas.** Discourage the establishment of new growth areas within or beyond agricultural areas that create additional traffic pressure on the local rural road network;
13. **Major Street Network.** Continue the process with the Ministry of Transportation and Highways toward the establishment of a Major Street Network Plan, and expand the process to include, CORD, Lake Country, and the Land Commission;

14. **Safety Signage.** Consider the development of signs for agricultural areas that promote the recognition of safety issues in agricultural areas with respect to hidden driveways, trucks turning, slow farm traffic, spray drift, and farm equipment crossings;
15. **Agricultural Signage.** Consider the use of commercial / educational signs at the urban / rural interface only, that warn motorists that agricultural activity should be expected or that direct traffic to farm business / agri-tourism opportunities;
16. **Landscape / Ditch Maintenance.** Encourage a higher level of landscape / ditch maintenance, within the public right-of-way and on private land, to improve driver sight distance and visibility at crossings, intersections, driveways, and sharp curves, and thus reduce the need for signage;
17. **Recreational Activities.** Require that race organizers establish a notification process for agricultural properties that allows the agricultural community to respond to the potential impact of their operations on recreational activities and that organizers advise all participants of potential hazards in working agricultural areas.



UTILITIES

Water Supply Issues

- Continued access to water supply
- Protection of water quality
- Cost of water
- Potential system expansions
- Decision making

Continued Access to Water Supply

The availability of an adequate water supply is fundamental to the survival of agriculture in the City. Since most of the water used for agricultural purposes comes from watersheds with limited storage, the amount of water available for distribution by water purveyors depends on climatic conditions and is highly variable from year to year. The amount available in drought years is significantly less than in normal runoff years. The Ministry of Environment (MOE) established criteria in the early '70's for the design of large irrigation systems. The design criteria used are essentially that the water systems must be capable of supplying peak demands at least 29 years out of thirty. This drought year definition was established for tree fruit crops which are considered to be the highest water use crop and the most susceptible to injury due to water shortage. The criteria has resulted in a conservative design of the major water systems and no Water District has come close to running out of water in the past 20 years, in contrast to earlier years when water shortages were common.

The three large Districts have added water supply facilities in conjunction with increased irrigated areas and residential development so that the amount of water available for each user is at least as much as was the case before the developments were added.

The three Irrigation Districts all have some surplus water available at the present time but not enough to supply all the potentially irrigable land in their future service areas. The Districts do, however, have long range plans to augment the amount of water supply available should it become necessary to do so. A summary of these potential projects with the amount of water that each would provide is indicated in **Table 7 - Future Water Supply Projects**.

These water supply projects are adequate to permit all ALR lands within the City to be serviced, however, there are non-agricultural lands within the service areas and lands outside the City boundaries that likely will want water in the future and may use up these reserves. There are more potential water development projects available but they are very expensive and well beyond the costs that are traditionally used. It should be noted that much of the agricultural land not presently irrigated is very marginal and not likely to be irrigated soon.

Table 7 - Future Water Supply Projects

District	Project	Additional Water Supply
BMID	1. Gopher Flats Reservoir	3400 da-m³
GEID	1. Vector Well No. 2 2. Okanagan Lake Pump Station	1100 da-m ³ 2200 da-m ³ Total: 3300 da-m³
SEKID	1. Turtle Lake Reservoir 2. Miller Road Reservoir 3. KLO Creek	840 da-m ³ 620 da-m ³ 370 da-m ³ Total: 1830 da-m³

Note: da-m³ means cubic decametre (1 cubic decametre equals 1000 cubic metres)

The irrigated land in the Mission Creek Water Users Community area has been reduced substantially by residential subdivisions so the amount of water available for this group is much higher on a per unit basis than was previously the case. There is very little agricultural land that is not irrigated in this sector.

On-going water efficiency programs and continued improvements in irrigation equipment are expected to further reduce water use by 10 - 30%. Water efficiency measures combined with the identified water supply projects should provide enough water to supply all demands in the foreseeable future.

The technology of irrigation systems has changed considerably in recent years and the newer systems are much more efficient than the older ones. The newer installations monitor soil moisture and only apply the amount of irrigation water necessary. However, the conversion to more efficient irrigation systems may not be taking place as quickly as the Districts would like. At least part of the problem is the lack of financial incentive for the users to convert, considering the current basis that all Districts charge for water is a flat rate per land area. This method does not recognize or compensate for efficient irrigation systems; therefore, there is little incentive for users to improve their irrigation systems.

Agricultural water users generally are perceived by as being inefficient in the use of water. In reality, any wastage of water is probably less than perceived, and other users may be less efficient than commercial irrigators. The Association of B.C. Irrigation Districts (Water Supply Association), with the assistance of the Ministry of Agriculture, undertook a comprehensive study into the management of irrigation district water systems in 1990.

The findings of the study, prepared by Kerr, Wood Leidal Associates Ltd. entitled "Summary Report on Demand Management of Irrigation District Water Supplies in the Okanagan Valley", were that an effective demand side management (DSM) strategy, including universal metering, public education and conversion to drip / trickle irrigation systems could save as much as one-third of the total annual water use for agriculture. The costs of the DSM are quite high and would need to be phased in over time.

The Irrigation Districts have all implemented some form of on going water conservation programs. Peak flows to individual lots are regulated by control devices such as flow control valves and/or pressure regulators. Water bailiffs are employed by the three Districts to patrol and monitor water use. SEKID has installed flow meters on all irrigation services and has supplied soil moisture monitors to all commercial irrigators. The District is currently reviewing the metering data and is working on a strategy to implement further water conservation measures. GEID has supplied flow meters and moisture sensors to a number of users and has employed a technician to work with farmers to evaluate the effectiveness of these devices.

Protection of Water Quality

The quality of water supplied by the major irrigation systems is of limited consequence for agricultural users but because the system is also used for domestic purposes there is potential for a major cost impact. The water supplied by the three major systems generally is within the Canadian Water Quality Guidelines for irrigation purposes. High turbidity levels can be a problem with microjet or drip systems and most operators with these types of systems require filters to remove suspended particles.

While water quality is not a particular problem for irrigation users it is a very important issue for Irrigation Districts. There are frequent periods when the Canadian Drinking Water Guideline limits are exceeded and many residential users become upset when their drinking water is discoloured or turbid. Residential consumers in Canada have come to expect water that is free from colour, turbidity, odour and objectionable taste. While considerable effort has been made and fairly large amounts of money spent to reduce the levels of objectionable constituents, there continues to be a demand for more aesthetically pleasing water. A number of studies have concluded that to provide effective colour and turbidity removal it will be necessary to construct conventional treatment plants with settling and filtration. Unfortunately, because the present distribution systems are combined irrigation / domestic systems, the amount of water that needs to be treated is very large and the costs are extremely high. For example, a study conducted for SEKID in 1994 by a Consulting Engineering firm, Dayton and Knight Ltd., estimated that a water treatment plant at the Hydraulic Creek intake would cost \$45 Million, or \$21,500 per residential service. A less expensive option, discussed in the same report, would be to install a separate distribution system for domestic water and treat only the domestic component. The cost of this option was estimated to be \$23 Million or \$11,000 per household. This amount is still considered to be well beyond the affordability of most users. Other less expensive (and less desirable) options include 'Point of Entry' devices, satellite treatment plants to serve concentrated areas of residential users, and Bottle Water Plants. The foregoing options and costs are specific to SEKID but studies undertaken for the other Districts indicate similar treatment strategies and costs.

In addition to the aesthetic concerns of colour and turbidity, there is also the very real possibility of a giardiasis and/or cryptosporidium outbreak, such as occurred in BMID in 1987 and the City of Kelowna in 1996. These types of gastrointestinal infections are indications of compromised source water and the likely solution may be suitable water treatment or an alternate source.

A probable scenario for major improvements in water quality for residential users will be to gradually install separate domestic and irrigation systems with the domestic systems using conventional treatment facilities. The domestic system would initially supply only the areas of concentrated residential development with the less densely populated areas using in-home or point-of-use treatment devices. The domestic systems would gradually be expanded as residential growth increases. The impact on irrigation of operating separate systems is made evident by **Table 6** on page 60, which shows that domestic users are paying up to 80% of the operating costs of the combined system. The costs of operating a separate irrigation system would at least double the irrigation rates being paid now.

A primary concern with respect to the protection of water sources is the need to maintain the quality of the watershed. A watershed is all of the water and all of the land that drains into a common catchment area. The City of Kelowna Environment Division has been active in the Kelowna area watersheds. The Environment Division provides watershed education; encourages, organizes and participates in watershed stewardship activities; and is also involved in watershed restoration. These programs address many different aspects of the watershed. The Clean Water Education Campaign (summer, 1997) used the BC Environment brochures to educate the various sectors of the watershed on the impacts of agriculture, pleasure boating, septic systems, urban runoff and non-point source pollution.

Watersheds transcend political and jurisdictional boundaries and therefore stakeholders need to work together to improve and maintain watershed health. The City of Kelowna is part of the Kelowna Area Watershed Initiative, a group consisting of agency, industry, water purveyors and political interests. This group has been meeting since June 1997 and has agreed that the Mill Creek Watershed will be the first watershed to focus its efforts on.

The City should continue to participate in and support programs directed towards watershed management and best management toward protection and maintenance of clean water sources.

Cost of Water

Several factors could have a significant impact on future irrigation rates:

Ageing Infrastructure

Most of the water supply infrastructure in place in the Irrigation Districts was constructed in the late 1960's and is about 20 - 30 years old. The operating costs have been low but can be expected to increase as the systems age. Some components such as pumps, chlorinators and regulating valves are approaching their life expectancy of 25 years and replacement will be necessary in the near term. Pipelines have a life expectancy of 50 years or more so it will be some time before major pipeline replacements are necessary.

Many of the ditches and control structures in the Mission Flats area are nearly 100 years old and have been poorly maintained in recent years. The ability of these systems to continue to deliver irrigation water is questionable.

Water License Fees

It is anticipated the Water License Fees will increase significantly in the near term. The present rate calculates to about \$2.50 per hectare (\$1.00 per acre) but indications are that this rate is likely to be increased.

Energy Costs

Energy costs are an important component of irrigation rates and represent about \$20.00 per hectare per year for GEID, which is nearly one-third of the total irrigation rate. West Kootenay Power (WKP) has a separate electrical rate schedule for irrigation users and the rate is significantly lower than most other rate schedules. WKP has stated in the past that the rate is lower than the cost of service and they likely will be applying to BCUC for a restructuring of electrical tariffs, which will increase irrigation rates at a faster pace than for other customers. Increases in electrical costs will have a much bigger impact on users with private systems as they all utilize pumping systems. Individual pumping systems are inherently more inefficient than community pumping units.

Urbanization

As parts of the Irrigation Districts are being urbanized new and improved roads are necessary. Upgrading of roads often results in modifications and sometimes the replacement of water system components well before the end of their life expectancy. Irrigation Districts usually absorb most of the costs of these changes through Capital Works programs but some of the costs are recovered through annual irrigation rates. Urbanization also makes maintenance and operation of water systems more expensive, which will increase irrigation rates.

Water Quality Improvements

Major capital outlays for water quality improvements are being considered by the three main Districts. The water quality improvements will be made to benefit residential users but it will most likely be necessary to separate the domestic and irrigation systems. If this happens the irrigators will lose the economic benefits of the combined system.

While the foregoing cost increases will have a significant impact on future irrigation rates, it is unlikely that the rates will ever become a large part of an agriculturist's budget and therefore not a major concern to the survival of agriculture in the City. However, short-term increases may impact individual operations in uncertain economic conditions that cause hardships for farmers.

Potential System Expansions

One of the issues identified is whether there is adequate water available to irrigate all the agriculture land in the City that is within the ALR. It is an important long term servicing issue to know whether all agriculture lands can be supplied and by which water purveyor. In particular, there are fairly large tracts of land that are not within any Water District and cannot be economically served by the City system.

Prior to 1995, it was City policy that the Irrigation Districts would be permitted to supply only those lands that were within the District boundaries as they existed in 1973. The City system would supply all lands not within the Water Districts. In the early 1990's the City recognized that this policy was impractical and that it would be much more economic for the Water Districts to expand to supply some of the un-serviced properties. The City proposed the development of a Kelowna Water Servicing Plan, and the Kelowna Joint Water Committee (KJWC) endorsed this proposal. An agreement was reached by the water purveyors on water supply areas for most of the lands in the City. The areas to be supplied outside each District is referred to as 'Future Service Areas' and are outlined in more detail in the 1995 "Water Servicing Plan". **Map No. 13 - Water Supply Areas** outlines the respective existing and future water supply areas. Although the Benvoulin – Mission Creek and South Okanagan Mission Irrigation District areas are indicated as future City service areas it is unlikely that the City would provide water in areas that are intended to remain as agricultural. SOMID and the Benvoulin – Mission Creek Water Users groups should remain as private utilities to serve agricultural needs.

While the future service areas are delineated by the Water Servicing Plan, the question of whether and how the land could be supplied was left up to the Districts to develop long term servicing plans. To assist in this process, an estimate of the amount of agricultural land not being irrigated was made. The estimate was made using air photos and District assessment rolls.

The results of the review, shown on **Table 8 - Serviced and Un-serviced Lands**, indicates that about 6,175 hectares are irrigated out of a total of 9,550 ha of land in the ALR. Of the remaining 3,375 ha not irrigated, some of the land is in low swampy areas that would not benefit from irrigation and some land is too steep to irrigate. Much of the remaining land is located along the eastern boundary of the City at upper elevations. Table 8 also shows the amounts of un-serviced agricultural land within the existing and future service area of each water purveyor and the amount of water required to supply these lands.

The table shows that GEID and SEKID do not have sufficient water available at present to supply all un-serviced land. In reality, the water is available but there is a lack of infrastructure to provide service to some areas. Within their service areas the deficit amounts are relatively small and each has long term plans to develop resources which could supply the lands should the owners want water.

BMID has adequate water to supply the undeveloped lands but the capacity of the mainline from Mission Creek may be too small to deliver the flows required. Construction of the Gopher Flats reservoir would resolve this problem as well as a number of other distribution system and water quality constraints.

- █ LAKE COUNTRY
- █ RUTLAND WATERWORKS
- █ CITY SERVICED AREA
- █ FUTURE CITY SERVICE AREA
- █ MCKINLEY LANDING WATERWORKS
- █ FUTURE MCKINLEY LANDING WATERWORKS
- █ BLACK MOUNTAIN IRRIGATION DISTRICT
- █ FUTURE BLACK MOUNTAIN IRRIGATION DISTRICT
- █ GLENMORE-ELLISON IMPROVEMENT DISTRICT
- █ FUTURE GLENMORE-ELLISON IMPROVEMENT DISTRICT
- █ SOUTH EAST KELOWNA IRRIGATION DISTRICT
- █ FUTURE SOUTH EAST KELOWNA IRRIG.DISTICT

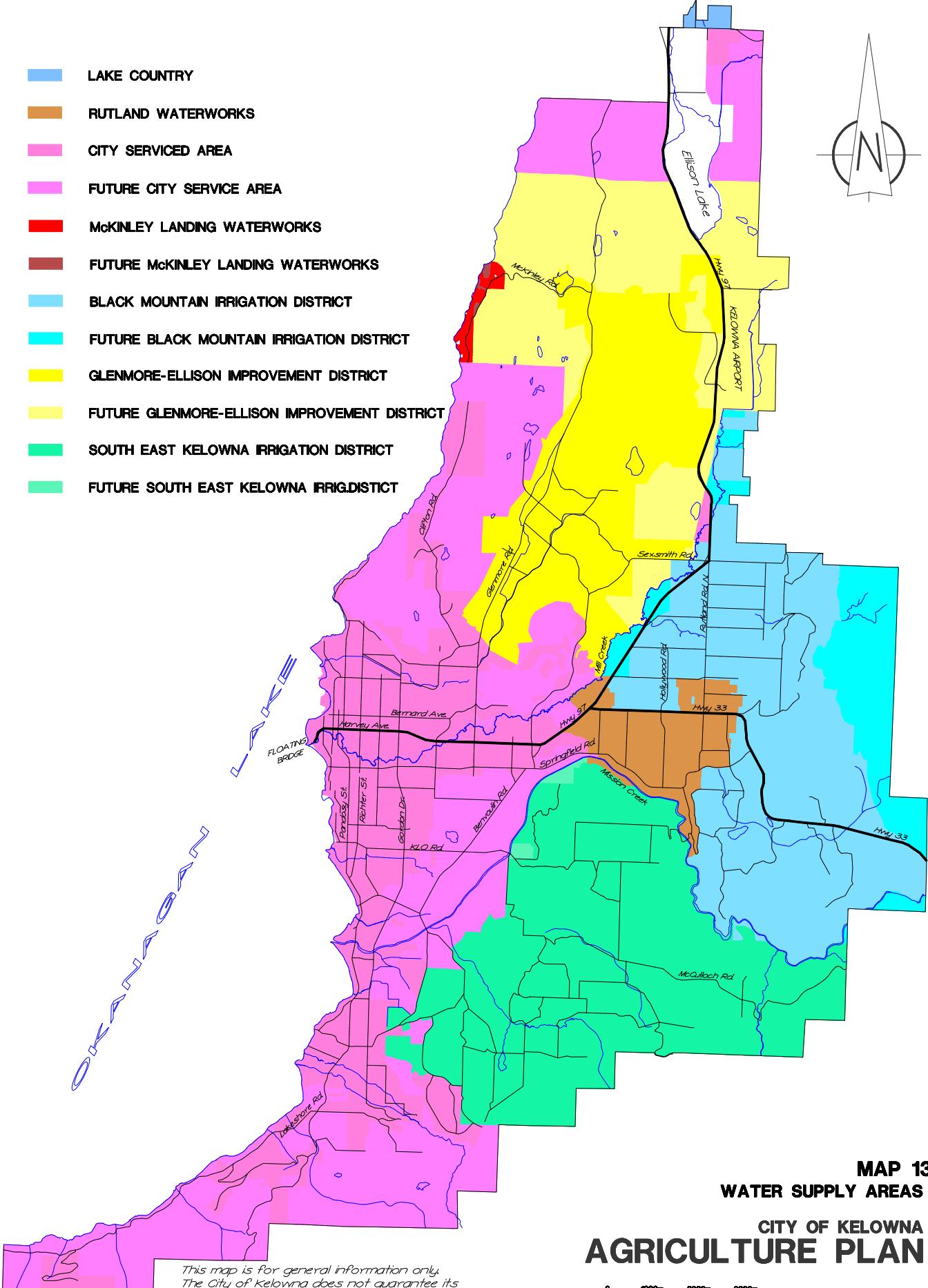
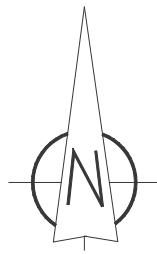


Table 8 - Serviced and Un-serviced Lands

DISTRICT	BMID	GEID	SEKID	SOMID	Mission WUC's	Private Systems
Total Land Area Serviced (ha)	2,750 ⁽¹⁾	1,600 ⁽²⁾	2,193	n/a	150	450
Irrigated Land Serviced (ha)	2,145 ⁽¹⁾	1,280	2,070	80	150	450
Dry Land in ALR (ha)	1,500	280	240	none	none	unknown
Peak Annual Water Requirement (da-m) ⁽³⁾						
Present Users	19,210	7,950	14,950	600	560	unknown
Future Agricultural Users	4,620	1,700	1,800	-	-	unknown
Total Present & Future Users	23,830	9,650	16,750	600	560	unknown
Water Available - 1996	24,080	9,450	15,990	600	560	n/a

(1) Totals for BMID include Scotty Creek Area, which is outside City

(2) Totals for GEID include Ellison Area which is outside City

(3) da-m³ means cubic decametre (1 cubic decametre equals 1000 cubic metres)

There are also lands outside the City boundaries that are developable for either agriculture or residential purposes and to utilize the property would require a supply of water. In particular there are sizeable parcels east of the City that have additional use potential. These lands have not been factored into the water supply/availability equation because new users are supplied on a 'first come, first served' basis with no consideration given to whether the properties are in the City or not. The Districts generally have been prepared to supply new lands providing that the full cost of new works is borne by the new development.

A very important consideration in supplying water to additional land is the upgrading of distribution systems that will be necessary. Most of the un-irrigated land lies at the outer extremities of the Districts and the works needed to provide enough distribution system capacity to supply a significant amount of water are quite extensive. The cost of these works will be high and will be reflected in the Districts Capital Works fees thereby being a major detriment to new users. Of particular significance is the large block of un-irrigated land east of BMID. This block is the largest un-serviced area in the City. BMID has adequate water supplies to serve the properties but the extensive distribution system needed to service the area will be expensive. This area is nearly all in the ALR.

At the present time water is available to supply all un-serviced agriculture land in the City however the costs may be very high to some areas and there is no surety that water will continue to be available if land owners outside the Districts are served.

Much of the land intended to be within the future service area of the City of Kelowna system is serviced with private irrigation systems or wells for agriculture irrigation purposes. Similarly to the Irrigation Districts, the City has water available and distribution systems in close proximity, but the cost of extending water service to these lands would

likely outweigh the economic return from agriculture. It may be more economical for these groups, in particular the Mission Creek / Benvoulin Water Users Groups and other private systems to continue to operate as suppliers of agricultural irrigation water. Restoration and maintenance of the system will require on-going commitment on the part of the user groups. An update of the 1979 Ministry of Environment Study to identify potential funding sources to assist these user groups may be appropriate.

Certain lands, some adjacent to each Irrigation District or the City service area, are unserviced because they are outside, and in many cases at the extreme end, of their respective distribution systems. The Kelowna Joint Water Committee Water Servicing Plan outlined the intended water supplier for all areas, based on the capabilities of each water purveyor, and upon topographic constraints. In some cases it will be necessary to amend Irrigation District boundaries and the City of Kelowna should support the amendments as required. In addition, there are specific circumstances where urban developments in the future will be required to upgrade or extend water distribution facilities, and that may have some benefit to agriculture. Urban development on gravel extraction lands south of Quail Ridge Boulevard could provide increased availability of water as part of the GEID system for lands on the north side of Quail Ridge Boulevard. Similarly, development of lands in the Mission Ridge area or Crawford Estates could provide infrastructure, as part of the City system, that would increase water availability to agricultural lands south of Dehart Road and east of Crawford Road. It must be recognized that actual water service to these lands is limited, with improvements still paid for by the benefiting agricultural property owners, and that these costs could outweigh potential agricultural returns.

Water Supply Objectives

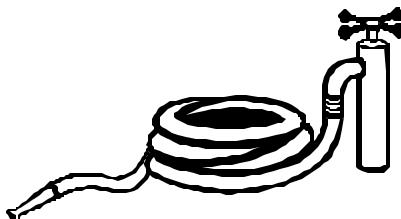
- To maintain the availability of an adequate supply of water for the agricultural community.
- To minimize the cost impact of potential water quality improvement measures on irrigation users.
- To minimize the short-term impact of Irrigation District operations on irrigation rates.
- To irrigate all the usable agricultural land in the City that is in the ALR.
- To support decision making with respect to Irrigation District operations with the needs of the agricultural community as a priority.

Water Supply Policies

The City of Kelowna will:

1. **Irrigation Priority.** Encourage Irrigation Districts to protect the needs of the agricultural users so that they are not compromised by service extensions to non-agricultural or development lands;
2. **Demand Management.** Encourage Irrigation Districts to implement demand side management strategies;

3. **Conservation.** Encourage Irrigation Districts to maintain on-going water efficiency and conservation programs;
4. **Water Quality.** Encourage water purveyors to provide water consistent with all applicable guidelines and regulations while remaining sensitive to irrigation customer needs;
5. **Clean Water Program.** Continue to participate in and support programs directed towards watershed management and best management toward, protection and maintenance of clean water sources;
6. **Irrigation Rates.** Encourage Irrigation Districts to pursue operational strategies that maintain short term irrigation rates during uncertain economic conditions;
7. **Servicing Plans.** Support Irrigation District long term servicing plans to supply agricultural lands should the owners want water for agricultural purposes, in accord with the Water Servicing Plan prepared for the Kelowna Joint Water Committee;
8. **Private Systems.** Encourage the Mission Creek / Benvoulin Water Users groups, SOMID, and other private systems to continue to operate as suppliers of irrigation water for those areas intended to remain as agricultural;
9. **Maintenance.** Encourage the operators of private irrigation systems to restore and maintain these systems for the on-going benefit of agriculture;
10. **Update Study.** Support an update of the 1979 Study by the Ministry of Environment of the Mission Creek Water Users groups irrigation systems to identify potential funding sources to assist in restoration and maintenance of the systems;
11. **Irrigation District Boundaries.** Support the necessary amendments to Irrigation District Boundaries to allow expansion to un-serviced areas, in accord with the Kelowna Water Servicing Plan;
12. **Urban Development.** Consider the extension or upgrading of water supply infrastructure through urban development towards providing irrigation service to lands north of Quail Ridge Boulevard and southwest of Dehart Road / Crawford Road, for agricultural purposes.



Drainage Issues

- Improvement measures in drainage problem areas
- Downstream flood protection
- Lack of dredging in Mission Creek
- Placement of fill in drainage problem areas

Drainage Problem Areas

On-farm drainage is not the responsibility of the City. Drainage ditches and watercourses within public rights-of-way are a shared provincial / municipal responsibility at this time, however, and its adequacy directly impacts on the ability of individual farmers to improve their on-farm drainage. Resolution of drainage issues should include the involvement of the Land Commission. There are a number of specific problem areas where improvements may have some benefit to agriculture. Resolution of drainage issues should include the involvement of the Land Commission.

Area North of Reid's Corner

The general area north of Reid's Corner from Edwards Road to Bulman Road along the east side of Mill (Kelowna) Creek has been identified as an area with unique drainage characteristics. This poorly drained area occurs at least in part, due to flooding from Mill Creek. Alleviation of the drainage problem may require deepening and widening of the creek, a potentially contentious issue due to the modification of a natural drainage way. Downstream flooding may also occur due to periodic high flows.

The Ellison Basins Drainage Management Plan includes the Upper Mill (Kelowna) Creek Basin and recommends a program of culvert and in-channel upgrades and hydraulic improvements that could alleviate the nuisance factor of the occasional flooding of adjacent farmland under existing conditions. The cost of these improvements should be weighed against the negative impact, if any, of the occasional flood on agricultural land. Creek channel improvements may increase the ability to convey flood flows; however, it must be recognized that this area is a floodplain.

The Basin Management Plan also discusses a high development scenario where lands east of the ALR, within the Regional District, could be developed with up to a factor of 25 % impervious conditions. This scenario identifies the potential for channel improvements, in-channel wetland construction, and 3 detention / wetland facilities, between the Airport and Edwards Road, along the east side of Mill Creek, all located within the ALR. The area of prime concern would be south of Bulman Road due to added flow from Scotty Creek at Bulman Road. The periodic high flows from rainfall events or spring snow melt would be directed to detention facilities as temporary storage at peak times, with gradual release over time. The establishment of constructed detention facilities and wetlands could limit the extent of flooding on surrounding agricultural lands as well as protect downstream areas. Dry detention facilities east of the Airport and immediately south of Bulman Road could be utilized for forage crops.

Currently there is a natural wetland area in the Kelowna Springs area that could be enhanced to hold greater volumes of storm water runoff, provide an opportunity to improve water quality prior to release into Mill Creek, and provide a natural buffer between industrial development and more productive agricultural lands to the east and north. An increase in the waterfowl habitat potential in this area must be balanced with the need to maintain clear approaches to the Kelowna Airport. An overall wetland management concept for the area is being pursued at this time. The process to establish the wetland boundary should include the Land Commission.

Although the Ellison Area OCP, prepared by the Central Okanagan Regional District, does not envisage significant urban development east of the City of Kelowna boundary it should be recognized that development could have an impact on downstream storm water detention needs. In addition to potential impact on ALR lands needed for detention facilities, there would be significant cost factor over and above the improvements necessary to manage drainage under existing conditions, should any significant urban development occur. There should be a process to consider the impact of potential development, and any Provincial or Regional cost sharing responsibilities.

Robert Lake area

Robert Lake has no natural discharge channel and the margins of the lake may flood, depending on the amount of water inflow from snowmelt and rainfall. The water levels could be controlled by construction of a drainage outlet to municipal ditches. The outlet would need to be underground since an open ditch to traverse the intervening height of land would have to be overly deep and cause safety and maintenance concerns. Although flooding could be controlled by development of an adequate outlet, the agricultural capability of the affected lands would still be severely curtailed by the strongly saline soil conditions that exist.

The construction of an outlet, presumably to the east arm of Brandt's Creek, would be an expensive proposition to protect surrounding farmland from occasional high water, particularly if poor soil conditions would still exist. In addition, more water introduced to Brandt's Creek may increase the size of required detention facilities further downstream.

The Brandt's Creek Basin Study describes the Robert Lake area as a sink, absorbing runoff from surrounding hillsides, with water lost through evapotranspiration or as subsurface drainage to ground water. The Basin Study recommends that building on the perimeter of Robert Lake be restricted to avoid hazardous conditions and ensure storage capacity. In addition, the placement of fill material should be prohibited until some assessment of impact on drainage is completed.

Near Valley Road - Cross / Longhill Road Intersection

This relatively small area of poorly drained soils currently has the water table partially controlled by municipal ditches. Even with adequate drainage, soil capability is still substantially curtailed (i.e. Class 4) by saline soil conditions.

The Brandt's Creek Basin Study recommends channel improvements to the east arm of Brandt's Creek south of Longhill Road and 2 detention facilities east of Valley Road in the ALR. The first would be located at the southeast corner of the Longhill - Valley Road intersection and the second would be located east of Valley Road opposite the Raisanen Road area. The dry detention facilities are necessary to protect downstream areas and the channel improvements would assist in improving farm drainage from the east.

Mission-Benvoulin Flats area

Drainage can be improved in this area by ensuring that ditches, pumping, and other infrastructure is sufficient not only to control run-off but also provide individual land owners with the ability to dispose of excess on-farm water from tile drains and on-farm ditches. This implies that ditches have the capacity to remove excess water so that on-farm ground water tables can be maintained at depths that are adequate for most agricultural cropping and cultivation (a freeboard of 1 m is generally satisfactory).

Proper ditch construction (i.e. sloped sides to minimize sloughing and 'cave-ins') as well as ongoing maintenance (i.e. periodic cleaning and vegetation control) are also required. As well, sufficient pumping capacity from regional ditches to Mission Creek (or other disposal) is also needed during periods of high water so that adequate freeboards are maintained in the agricultural areas. The practice of piling materials from ditch construction/cleaning adjacent to the ditches should be discouraged since the resulting berm restricts surface water from access to the ditches.

The main areas of very poorly drained soils are located near Mission Creek and south of the creek, including an area of organic soils adjacent to, and west of Swamp Road. Organic soils are susceptible to accelerated decomposition and subsidence if over drained, therefore, special attention should be given to lowering the water table the minimum amount required for crop production. During the winter months, depending on agricultural land use (i.e. annual vs. perennial crops) the water table can be allowed to rise in the soil to minimize decomposition.

The Mission Creek Basin Study and the draft Hydrogeological and Geotechnical Assessment identifies the areas adjacent to lower Mission Creek as a discharge area for most of the Mission Creek Watershed. In particular the area south of Mission Creek and west of Swamp Road is impacted by a combination of ground water discharge, high water table associated with Okanagan Lake, and direct contact between Mission Creek and the shallow ground water conditions. Due to the large volumes, draining the ground water is not considered a practical solution. In general the Basin Study recommends the use of detention facilities, channel improvements and ditch maintenance to manage drainage. The Study also recommends improvements in specific sub-watersheds.

The Swamp Road and the Thomson Creek sub-watersheds will require improved ditch maintenance, regular maintenance of the existing overflow diversion to Thomson Creek, additional pumping capacity for the wetland / detention facility adjacent to Mission Creek at Gordon Drive, and an additional detention facility east of Gordon Drive on Thomson Creek to handle overflow from the diversion. The natural wetland conditions in the area should be retained and filling curtailed.

During parts of the summer irrigation is required on the affected lands as well. The possibility of using the drainage ditches as distribution systems for irrigation water, at least for parts of the area, should be investigated. A system of 'baffles' in the ditches could be used, perhaps, to regulate water levels and supplementary water, as required, could be extracted from Mission Creek (or the shallow groundwater table).

A more detailed study for the Swamp Road and Thomson Creek sub-watersheds should be conducted to establish cost estimates for works and on-going maintenance and to determine the potential for a net agricultural benefit to the surrounding farmlands. In addition to establishing the overall storm water management needs for the area, the study should also investigate drainage needs for and impacts of potential park development on the drainage conditions in the general area toward a drainage management plan. In addition, it would be appropriate to investigate the potential for senior government cost sharing for the study and works, based on their interest in agricultural benefits.

Downstream Flood Protection

In addition to the above noted areas with specific drainage problems there are a number of other circumstances where drainage issues occur due to downstream capacity problems, or where drainage works are required to protect downstream uses, or where natural wetlands exist in farm areas. Downstream capacity in existing urban areas cannot be increased without major disturbances to existing communities or major cost. The use of detention facilities would reduce the need for more costly creek channel upgrades. It must be recognized that the proposed detention facilities, in most cases, would be for the temporary storage of storm water in dry basins. All of these sites would be located within the ALR either because they occur naturally or because existing urban uses preclude the development of detention facilities.

Insufficient capacity in downstream works has contributed to potential flood conditions in certain areas. Campbell Brook, in the area north of Moyer Road, becomes a piped system extending west under Rutland Road North and Highway 97 to Mill (Kelowna) Creek. This area becomes a water retention area at certain times of the year, partially due to the piped portion being insufficient to handle increased flows and partially to a natural wetland in a low clay depression where water accumulates. The Ellison Basins Management Plan recommends that this area be enhanced as a wetland due to downstream capacity limits and water quality improvement prior to discharge into Mill (Kelowna) Creek. Gopher Creek is also a piped system through the developed portion of Rutland, beginning at Springfield Road. The Gopher Creek Basin Study recommends an engineered dry detention facility on Gopher Creek south of Springfield Road due to insufficient capacity in the piped system to handle storm water flows from upstream uses.

Sites in several Basin Management Plans (Highway 97 north of Scandia, east of Valley Road, near McCulloch Road - Gulley Road intersection, Francis Brook at McKenzie Road) are also required to protect downstream land uses from flood hazard. The Highway 97, Valley Road, and McCulloch Road sites would be engineered dry detention facilities, and the Francis Brook site would be an enhanced wetland of an existing sink.

Currently the excess storm water run-off from portions of the South Rutland area may find its' way to the irrigation channel for the Benvoulin Water Users Group. The Basin Study recommends two options for consideration. A separate dry detention facility east of Mayer Road is proposed for ground disposal or the irrigation channel passes through the proposed Mayer Road detention facility, with the irrigation channel as a permanent wetland channel for quality control, while the storm water overflow would be to dry detention areas adjacent to the channel for ground disposal. Any decisions regarding the impact of storm water disposal on the irrigation channel should involve the Benvoulin Water Users Group.

Several sites have also been identified as potential detention facilities primarily for water quality improvements. Two sites east of Mission Creek in the Hall Road area would be engineered wet detention facilities, prior to discharge to Mission Creek. Natural wetlands at Rumohr Creek and Priest Creek (Casorso Marsh) confluence with Mission Creek would be enhanced wetlands. Natural wetlands within agricultural areas should be retained or enhanced to provide storm water protection and quality improvements. Options for storm water retention other than detention facilities should be fully explored prior to using agricultural lands for downstream flood protection. Where options for storm water retention are limited and agricultural lands become targeted for detention facilities it would be appropriate to consider dry detention facilities so that some agricultural activities could still be pursued within the proposed sites.

An additional concern expressed by the agricultural community is the potential impact of urban development on adjacent agricultural operations from run-off or other affects on the groundwater regime or water table conditions. Agricultural land should not be considered as appropriate ground disposal areas for urban drainage. The Stormwater Policy and Design Manual includes requirements for development to manage their drainage and direct flows to urban drainage works and away from adjacent land. The Stormwater Policy and Design Manual should be amended to require investigation of potential impacts on groundwater or water table conditions and mitigation measures established where appropriate.

Lack of Dredging in Mission Creek

Some of the wetland conditions present in the Benvoulin Road area and the Swamp Road area may be attributable to the lack of dredging in Mission Creek, and lack of ditch maintenance throughout the general area.

It is recognized that over the years the level of Mission Creek bed has risen so that the water level is higher, at times, than the surrounding land outside the dike. That fact, in conjunction with the fact that the existing dike is constructed from porous material originally dredged from the Creek, may contribute to the wet conditions in the area.

However, it must also be recognized that these areas are flat lands in proximity to Okanagan Lake and that water tables will tend to be higher regardless of Mission Creek levels. A recent Hydrogeological and Geotechnical Assessment conducted for the City indicates that ground water contours converge into a discharge zone in the Swamp Road area.

Dredging of Mission Creek and increased maintenance levels in ditches may help reduce the impact of high water tables, but they in themselves may not be the whole solution. There is also the contention that fish spawning beds have silted over due to lack of maintenance and that fish stocks have depleted, partially due to lack of suitable spawning habitat in Mission Creek.

Given the importance of Mission Creek as a fish spawning channel there is a need to balance drainage issues with the maintenance of fish habitat. The Ministry of Environment, Lands, and Parks should investigate the impact of dredging in the lower reaches of Mission Creek on fish habitat to ascertain if there is potential to lower Mission Creek bed to create a more positive drainage flow to the benefit of adjoining City and agricultural lands, as well as improvement for fish spawning habitat.

Placement of Fill

The placement of fill material in order to improve the capability of a given site for farming is generally a supportable enterprise. There are circumstances, however, where the placement of fill may have an impact on the drainage pattern or groundwater / water table conditions of adjoining properties. Permits for the placement of fill under the Soil Conservation Act are approved by the Land Commission and the City. Regardless of the Land Commission decision, the City has the authority to refuse to issue a soil removal or fill placement permit and place additional conditions on such a permit.

In known drainage problem areas it may be appropriate to require, as part of the approval process for the placement of fill, a drainage impact assessment by a qualified professional, to determine the likely impacts on adjoining lands and recommend potential mitigation measures. The level of assessment could range from simple lot grading plans to hydrogeological assessment, based on the magnitude of the drainage problem, depth to groundwater, and site coverage and depth of the proposed fill area.

Drainage Objectives

- To support drainage improvement measures within specific agricultural problem areas.
- To limit the impact of drainage improvements on agricultural areas.
- To investigate the impact of Mission Creek dredging on water table conditions and fish habitat.
- To limit the impact of fill placement on drainage conditions.

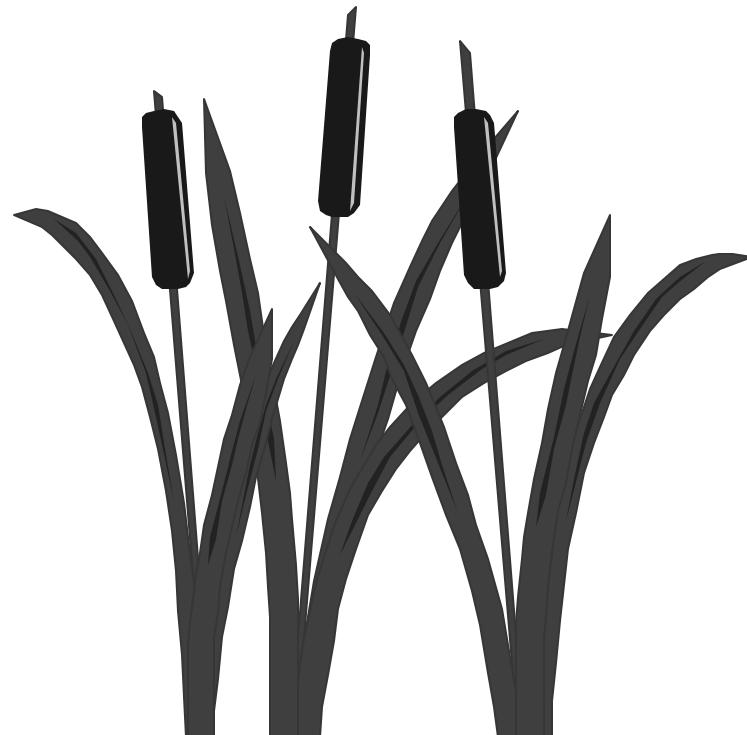
Drainage Policies

The City of Kelowna will:

1. **Mill (Kelowna) Creek.** Support a program of culvert improvements, in-channel upgrades, and hydraulic improvements to alleviate occasional flooding in the Upper Mill (Kelowna Creek) Basin, as recommended in the Ellison Basins Drainage Management Plan;

2. **Kelowna Springs.** Support enhancement of the natural wetland in the Kelowna Springs area for water quality improvements and as a natural buffer between urban industrial uses and agricultural lands to the north and east, and include the Land Commission in the decision making process to establish the wetland boundary;
3. **Airport.** Consider the impact of increased bird habitat on the Kelowna Airport operations as part of any improvements to the Kelowna Springs wetland area;
4. **Cost Sharing.** Establish a process to consider the impact on drainage requirements of potential development outside City boundaries, and any Provincial or Regional cost sharing responsibilities;
5. **Robert Lake.** Support limitations on land use in the vicinity of Robert Lake to avoid hazardous conditions and ensure storage capacity, as recommended in the Brandt's Creek Basin Study;
6. **Brandt's Creek.** Support a program of channel improvements to the east arm of Brandt's Creek east of Valley Road, as recommended in the Brandt's Creek Basin Study;
7. **Swamp Road.** Support the retention of the natural wetland in the Swamp Road area, including the curtailing of filling activities;
8. **Drainage Study.** Conduct a more detailed drainage study for the Swamp Road and Thomson Creek sub-watersheds, including the Mission sportsfields, to establish cost estimates for works and on-going maintenance, and to determine the potential for a net agricultural benefit to surrounding farmlands. The study should also investigate the drainage needs for and impacts of potential park development on the drainage conditions toward a drainage management plan. The potential for senior government cost sharing for the study and works, based on their interest in agricultural benefits, should also be investigated;
9. **Irrigation.** Investigate the potential to use the drainage ditches in the Swamp Road - Thomson Creek sub-watersheds as distribution systems for irrigation water during parts of the summer;
10. **Benvoulin Water Users Group.** Include the Benvoulin Water Users Group in any decisions regarding the impact of storm water disposal on their irrigation channel;
11. **Natural Wetlands.** Support the retention or enhancement of existing natural wetlands within agricultural areas to provide storm water protection and water quality improvements;
12. **Downstream Protection.** Explore options other than detention facilities, for storm water retention, prior to using agricultural lands for downstream flood protection;

13. **Dry Detention.** Support the use of dry detention facilities, where options for storm water retention are limited and agricultural lands become targeted for detention facilities, so that some agricultural activities could still be pursued within the proposed sites;
14. **Stormwater Policy and Design Manual.** Pursue an amendment to the Stormwater Policy and Design Manual to include a requirement for development to investigate the impact of development on drainage conditions, the groundwater regime and water table conditions, including recommendations for mitigation to prevent impact to adjoining lands;
15. **Mission Creek Dredging.** Encourage the Ministry of Environment, Lands and Parks to continue to monitor the lower reaches of Mission Creek and consider dredging to lower the creek bed, when appropriate, toward the creation of a more positive drainage flow to the benefit of adjoining City and agricultural lands;
16. **Placement of Fill.** Require, in known drainage problem areas, a drainage impact assessment by a qualified professional, to determine the likely impacts on adjoining lands and potential mitigation measures, with the level of assessment based on the magnitude of the drainage problem, depth to groundwater, and site coverage and depth of the proposed fill area.



URBAN – RURAL/AGRICULTURAL AREA AND BOUNDARIES RATIONALIZATION

Urban - Rural/Agricultural Boundary Issues

- Defined urban - rural/agricultural boundary
- Associated community growth needs
- Isolated areas
- Regional context
- Landscape Buffer and Fencing Specifications
- Urban buffers
- Rural buffers
- Parcel size
- Equestrian precinct
- Gravel extraction
- Application criteria

Urban – Rural/Agricultural Boundary

Grape Production

The Grape Atlas site suitability classes are indicated on **Map 7 - Grape Suitability Atlas**. Areas with Class 1 grape site suitability do not occur within the City boundaries. Generally, the areas with Class 2 or 3 site suitability for grape production include the Okanagan Mission area (and west), the lower elevations of South and East Kelowna, the Belgo area and the Rutland benches. More specifically, parts of the Okanagan Mission starting at approximately Barnaby Road and extending west along Lakeshore Road; the Rutland benches; areas along Mine Hill with south to south west aspects extending to Belgo Pond have a longer frost free season than other grape growing areas. Parts of the Okanagan Mission area also benefit from the moderating influences of Okanagan Lake. Lands in a diagonal from approximately the intersection of DeHart Road and Gordon Drive in the Okanagan Mission to about Dall Road (in East Kelowna) have a greater accumulation of Growing Degree Days (a measure of the amount of heat during the growing season). These latter areas also have a lower risk of autumn freeze, and therefore generally have a longer frost free season than other grape growing areas in the City.

Areas with Class 4 site suitability are generally unsuited to grape production except under special circumstances depending on the site, the grape variety chosen, and management skills of the operator. The low suitability areas of the Benvoulin Flats, Mission Flats, Glenmore Valley, are subject to high water tables and/or a short growing season and/or late spring frost and/or early fall frosts. Higher elevations such as Southeast Kelowna are of low climatic suitability because of the high risk of a short growing season and the high risk of extreme minimum winter temperatures less than -25 degrees Celsius for prolonged periods of time.

City lands that are suited for grape production as well as those that are poorly suited are usually suited to the production of a variety of other crops such as a selection of tree fruits, vegetables, berry crops, currents, hay and forage, turf, cereals, Christmas trees, one of the many niche crops, mushrooms, greenhouses, or various kinds of livestock including exotic animals, poultry, and birds such as quail and pheasants.

Tree Fruit Production

The City of Kelowna has a selection of climates and soils suitable for a variety of tree fruits and that the area of the City with soils that are suitable for tree fruit production is relatively large, as outlined on **Maps 8 and 9**. Areas not particularly suited to tree fruit production are often suited to other crops such as hay and forage, cereals, vegetables, berries, Christmas trees, niche crops, greenhouse crops, mushrooms, or various kinds of livestock including poultry and exotic animals.

Small Fruits, Vegetables, and Other Production

The Okanagan Valley (including the Kelowna area) is widely known for the production of tree fruits and grapes. Many people assume that if the land has low or poor suitability/capability for these crops then the land has little agricultural value. There is a wide range of other agricultural crops that are possible, such as vegetables, small fruits (berries), forages, etc. on most of Kelowna's agricultural lands.

Vegetable crops can be grown in all areas of the City. Strawberries and raspberries can be produced on all of the sites identified as high to moderate suitability for tree fruits and grapes. Highbush blueberries can be grown in areas of high or moderate suitability for McIntosh apples or grapes and in areas where strawberries and raspberries can be grown. High rated grape growing areas or areas suited for tender peaches and apricots may permit some commercial blackberry production. Currents may be grown in similar areas as apples, other tree fruits, grapes, strawberries, raspberries or blueberries. Nuts such as filberts (hazelnuts) may be grown in various parts of Kelowna on a commercial basis and soil requirements are similar to those of grapes and tree fruits. Production of other nut crops such as various types of walnuts, heartnut and butternut is limited to similar areas as tender peaches and tender apricots.

Specialty Crops

Lands that are suited for tree fruits, grapes and other local crops are also generally suited for niche crops, or the ingredients for niche products. Christmas tree production within the City is possible on all lands suitable for tree fruit and grape production as well as lands suitable for strawberries, raspberries and vegetables.

Non-soil bound agriculture for greenhouse or mushroom production is not limited by agricultural capability of the land on which these operations are situated. Use of urban land for such uses would probably not be economic, however, marginal ALR lands would be a practical choice.

Forage and hay such as grasses and alfalfa can be produced in most agricultural areas of the City which are not unduly limited by high water tables.

Office and field reviews of both the CLI Soil Capability for Agriculture ratings as well as the more detailed BCLI Land Capability for Agriculture ratings confirm the generally high agricultural capability of City's lands in the ALR. Furthermore, the boundaries of the ALR rather precisely define these capabilities. Enhancements to the capabilities relate mainly to the supply of irrigation water for currently unserviced land and to the development of a comprehensive land drainage system in the Mission-Benvoulin Flats area.

Reviews of the climate and soil suitability for tree fruit production and grape site suitability mapping confirms that substantial City area is suited for these crops. As well, a wide range of small fruits, vegetables and field crops, as well as 'niche' crops are suited for production in the City's ALR, although all may not have similar suitability's in any particular location. These crops provide alternative options to tree fruits and grapes, particularly where these latter crops are poorly suited. Opportunities for non-soil bound crops such as greenhouses and mushrooms also exist as do those relating to the livestock industry although the latter may be inhibited by high land costs.

Given the capability and suitability of agricultural lands as described above, and the variety of cropping options available, it would be appropriate to confirm support for the ALR and establish an urban - rural/agricultural boundary as outlined on **Map 14 - Urban - Rural/Agricultural Boundary**. Lands identified on Map 14 as ALR lands proposed for non-farm use would not necessarily be excluded from the ALR. Some of these lands may be retained in the ALR but be supported for non-farm uses. Establishing an urban - rural/agricultural boundary that uses existing roads, topographic features, or watercourses would be appropriate. Urban uses should be directed to land within the urban defined area, in the interest of reducing development and speculative pressure on agricultural lands. Further extensions of existing urban areas into farmland should be discouraged. Where new developments are supported on the urban fringe, sufficient buffers should be created as part of the urban development. In addition, the consideration of farmland as future development land may frustrate the OCP objective of increasing density within existing urban areas.

There are several agricultural areas where questions regarding suitability or capability have arisen. The Agricultural Land Capability Review and Cropping Options Study has clarified the situation and provided direction with respect to potential solutions or enhancements to retain these areas within the agricultural boundary.

The Quail Ridge - Dry Valley Road area is suitable for a variety of crops and would be more productive with an increase in the availability of irrigation water. Development of urban uses to the south of Lochrem Road would provide the infrastructure to bring water to the vicinity and support of that development would be of benefit to agriculture. Lands north of Lochrem Road in the Dry Valley Road area should remain in the ALR, as part of the rural/agricultural defined area.

The area east of Valley Road and south of Longhill Road has been identified as an area less suited for agricultural production due to drainage concerns, saline soil conditions, and frost impediments. However, an opportunity to pursue other forms of agriculture such as greenhouse facilities, nurseries, and other non soil-bound agriculture would be appropriate in this location. Such uses would provide an economic return from the land and create a compatible transition between urban uses west of Valley Road to the more

productive tree fruit lands east of the toe of the slope. It would also be appropriate to consider the creation of smaller, transitional lots west of the toe of the slope that could be used for non-soil bound agricultural operations or hobby farms. Parcel sizes less than 2.0 ha (5acres) could be considered where the toe of the slope warrants retention of the balance of the land to the east within the existing orchard units. This provision would be consistent with the direction of the emerging Glenmore/Clifton/Dilworth Sector Plan. Overall, lands east of Valley Road would remain in the ALR, as part of the rural/agricultural defined area and be supported for non-soil - bound agricultural activities and smaller hobby farm parcels.

The Land Commission has expressed concern over the notion of large houses backing onto farmland and suggested the need for more detailed study of the drainage problem to identify the source and if there is a feasible solution. It must be recognized that current drainage conditions are partially the result of several unusually wet years and that the City's drainage financial resources are limited and priorities may lie elsewhere.

As part of hobby farm subdivision approvals it would be appropriate, by restrictive covenant, to require that any new housing be located adjacent to Valley Road to reduce impact on the farmland to the east. In addition, hobby farm subdivisions would require road dedications and development cost charge's that could be used to upgrade the road and the east arm of Brandt's Creek to implement drainage improvements.

Land to the south of the proposed extension of Summit Drive from Valley Road to Dilworth Mountain has been previously identified as future development land for the logical extension of the Golfview subdivision, with the new road forming the urban - rural boundary. Land Commission support for this idea was predicated on a road location as far south as possible. Subsequently, a more northerly road location was agreed upon, however, the Land Commission approval of the road location required that land south of the road be consolidated and remain in the ALR. Previous City consideration of this idea was originally part of the exercise in negotiating the purchase of the road right-of-way and it is felt that the City position should not change as an indication of good faith in this matter, but the OCP should be amended to reflect the retention of this land in the ALR at this time.

Two large ALR properties south of Springfield Road between Cooper Road and Spall Road have been a long-standing source of discussion and disagreement on ALR status. Given the proximity to a major Urban Town Centre and location along a major City arterial road the City will continue to support the future exclusion or non-farm use of these properties.

ALR lands east of Dilworth Drive/Rifle Road north of Mt. Baldy Drive have been suggested by owners as future urban land due to potential urban uses surrounding the area, however, this area is suitable for some tree fruits, berries, and vegetables. Some on-site drainage improvements and reclamation of land inappropriately filled would increase productivity and support retention of this area in ALR, as part of the rural/agricultural defined area. Further consideration of portions of this area for other uses may be appropriate when an alignment for the extension of McCurdy Road from Highway 97 to Dilworth Drive has been identified.

Land southwest of Crawford and Dehart Roads has also been considered as future development land due to lack of water, and more particularly the expense of providing water as prohibitive to agricultural use. Other urban development in the vicinity may provide an opportunity to bring water to this area in the future. The land has suitability for tree fruits and grapes, among other crops, and should be retained in the ALR pending the future resolution of water supply issues.

Associated Community Growth Needs

There are several areas identified by the City as necessary for provision of public open space or other community needs that, due largely to the size of parcels necessary, are not possible within existing urban areas. As the City endeavours to protect and enhance agricultural values in Kelowna, it is simultaneously important to ensure that the needs of a growing urban community can be achieved.

The Glenmore Valley has been identified in the Official Community Plan as a growth area, and as a logical step to development in the Glenmore Highlands and the south and north McKinley areas in the future. Given that growth will be directed to these areas there is a need for a major District Park to serve future population in a location that will, ultimately, be central to this northern sector of the City. An appropriate location is being identified through the Glenmore/Clifton/Dilworth Sector Plan process. The City should seek the approval of the Agricultural Land Commission, through their consideration of the Sector Plan, to designate a site as Major Park / Open Space within the OCP.

The South Pandosy, North Mission, and Southwest Mission areas have also been identified as major growth areas that require the establishment of a centrally located District Park. The City has developed sportsfields east of Gordon Drive and south of Mission Creek, however, additional development of sportsfields and associated major recreation facilities in the area is deemed necessary to serve these future growth areas.

The general area has been described as a ground water discharge area and natural wetland that would be impractical to drain, and the ground water conditions are an impediment to agricultural activity. The Mission Creek Basin Study has indicated that improved drainage works in the area could provide a positive drainage flow that may alleviate excess water conditions, except during extreme storm conditions.

A more detailed study for the Swamp Road and Thomson Creek sub-watersheds should be conducted to establish cost estimates for works and on-going maintenance and to determine the potential for a net agricultural benefit to the surrounding farmlands. In addition to establishing the overall storm water management needs for the area, the study should also investigate drainage needs for and impacts of potential park development on the drainage conditions in the general area toward a drainage management plan.

The Land Commission has agreed in principle to the location of District Park facilities on land already filled, with further playing fields being built at a lower elevation on a portion to the south of the existing filled area, subject to the construction and committed operation of major pumping facilities designed to provide agricultural irrigation/drainage for the organic soil unit. The extent of new playfield development will be determined based on an

analysis of the agricultural benefit being provided by a specific City drainage works proposal.

The City should seek the approval of the Land Commission to use the balance of City owned land in the area for future open space and major recreation facility needs for the southern portion of Kelowna, based on a net agricultural benefit for adjoining farmlands as determined by the drainage management plan for the Swamp Road and Thomson Creek Sub-watersheds.

In addition, City owned land in the East Kelowna area has been identified as possible park development land. Although the future need for more sportsfields throughout the community would support additional development on the East Kelowna site, development at the Mission Sportsfields would be the priority. Additional sportsfield development in East Kelowna should not be pursued at this time.

Other civic needs related to the long term commitment to the Glenmore Landfill Site and the ultimate need for a new sewage treatment plant east of Burtch Road, have been acknowledged by the Land Commission as part of the Official Community Plan. These lands would not need to be excluded from the ALR. The Glenmore Landfill site may ultimately be converted to recreation or agriculture uses when the life of the current landfill is exhausted. The sewage treatment plant site, although permanent infrastructure, could include agricultural or other compatible uses, as a transition to the remaining agricultural lands in the area.

In dialogue between the City of Kelowna and the Agricultural Land Commission during the evolution of this Plan, a number of other sites to be designated for non-farm uses were advanced by the City, but not supported by the Commission. As part of on-going communication between the two jurisdictions, additional dialogue in these regards may assist in resolving differences.

Isolated Areas

There are two potential issues with respect to consideration of isolated areas. The first is the issue of existing or potential new urban uses within an agricultural area, the other an issue of rural or agricultural areas isolated from the general agricultural context.

Existing urban development within an agricultural area contributes to urban-rural conflict, adds to the speculative value of surrounding agricultural lands, and speculation weakens farmer capitalization. New urban development, even if appropriately buffered, also increases speculation and discourages farm investment. The City should not support extensions to existing developments or new development within agricultural areas, regardless of ALR status.

Existing rural/agricultural lands isolated from the agricultural context, regardless of agricultural capability, may be impacted by a number of factors that are not conducive to continuing agricultural production. One such location that has come under increasing pressure is the feedlot west of Highway 97, north of Leathead Road. Although this site is not directly threatened by urban pressure for development, it has become surrounded by urban uses that are impacted by the noxious odours created by the operation. The community need to remove this land from the ALR is not predicated on agricultural

capability, but rather, the recognition that a City has grown up around it and the feedlot is not an appropriate neighbour from an environmental and urban perspective. There is no question that this land would support other types of agriculture. However, it is unlikely that the legal non-conforming feedlot operation will be relocated without exclusion from the ALR.

Another issue with respect to this site is the City need to extend McCurdy Road to the west to the proposed North End Connector, and ultimately to Rifle Road. The Land Commission has conditionally consented to a major road designation and exclusion of the lands south of McCurdy Road as indicated on Map 14, subject to Land Commission involvement in the major road planning exercise. Therefore the City supports the removal of a portion of the existing feedlot site south of the proposed westerly extension of McCurdy Road, from the ALR, and will forward the necessary road design documentation to the Land Commission as part of the road planning exercise.

Lands to the west of the proposed Burch Road extension in the Munson Road area have also been identified as becoming isolated by what will become a major component of the City road network. On-going discussion with several property owners and the Land Commission has identified a number of alternatives. The City should continue to pursue a memorandum of agreement with the respective property owners and the Land Commission toward resolution of the road network and ALR status issues.

Regional Context

The City of Kelowna is located within the larger context of the Central Okanagan Regional District and has common boundaries with the District of Lake Country to the north and Electoral Area I to the east and south. Land use on either side of the City / Regional District boundary is an issue from the perspective of impact on adjacent uses both inside and outside the City.

The Central Okanagan Regional District has recently completed an OCP for the Ellison Area and a Rural Land Use Bylaw for the Highway 33 East area is currently in the formal adoption process by the Regional Board. In addition, the District of Lake Country has also adopted an Official Community Plan.

The Regional District planning initiatives reflect the existing rural character of the Ellison and Highway 33 East areas and generally support the retention of agriculture within their respective planning areas. The District of Lake Country has adopted an OCP that seeks to intensify land uses within existing urban areas and the Town Centre, and institute an urban containment area that protects rural / agricultural elements.

To that end there needs to be continued cooperation between the City of Kelowna, the District of Lake Country, and the Central Okanagan Regional District to ensure the ongoing compatibility of land uses on either side of the boundary toward the preservation of farming in the City, Lake Country, and Regional District.

Landscape Buffer Specifications and Fencing Specifications

Where physical urban-rural boundaries do not currently exist, or are difficult to establish, buffering or transition areas need to be created that provide some level of protection for

both urban residents and farm operations. The Provincial Agricultural Land Commission has established Landscape Buffer Specifications and Fencing Specifications to assist in this regard.

The buffer specifications include a combination of setbacks, fencing, existing vegetation, landscaping, as a physical and visual barrier, with varying degrees of width and landscape intensity depending on the desired level of protection. The buffer areas are intended to be established on the non-farm property. A vegetative screen (evergreen hedge) of 3.0 m and fencing would provide minimum visual screening and protection of farmland from trespass and vandalism. A 6.0 m landscape screen (medium height trees, plus screening and trespass shrubs) and fence would provide protect farmland from trespass and vandalism and provide minimum protection to non-farm development from dust and pesticide spray. A 15.0 m landscape screen (double row of medium height trees - conifer and deciduous, plus screening and trespass shrubs) and fence would provide a visual screen and airborne particle protection. A 20.0 m buffer would, including a berm in the standard landscape screen plus a fence, would provide protection from noise as well as airborne particle and visual screening.

The Zoning Bylaw should be amended to include setbacks and landscape buffer requirements consistent with the Land Commission Landscape Buffer Specifications and Fencing Specifications. Minimum widths should be considered on the basis of desired level of protection and should be established at standard road or half road widths, to support the potential need for future road, park, or public access corridors. In addition, the provision of bonding for the necessary works should be required at the time of rezoning, subdivision, and/or building permit to ensure compliance.

Urban Buffers

New developments adjacent to agricultural areas will be required to establish appropriate setbacks, fencing and landscape buffers on urban lands, as noted above, to mitigate potential conflict. In addition, for developments other than single or two family residential uses, there should be consideration of appropriate site planning measures that locate access roads, storage areas, or other spaces between agricultural lands and proposed buildings or public use areas.

In addition to the requirements for landscape buffers and fencing, it would be appropriate to consider the need for a covenant registered on the title, as part of the subdivision approval, that advises prospective buyers and land owners of the potential impacts of living near farm operations and conditions of the Farm Practices Protection (Right to Farm) Act. It may also be appropriate to support amendments to the Real Estate Act that requires disclosure to prospective buyers of these same conditions.

Rural Buffers

Where existing development abuts agricultural areas, and there is no option to provide buffering on the urban side, agricultural operators are encouraged to provide buffering wherever possible. Such buffering, in the form of farm houses and other buildings (not housing animals), storage areas, parking, internal roads etc., could remove some of the conflicts associated with farm operations. However, most farm operations are well established and changes of this nature may be minimal. In addition, it must be

recognized that in most cases the agricultural operations were in existence first and that as long as normal farm practices are maintained the farmer can continue to operate under the Farm Practices Protection (Right to Farm) Act.

Another alternative would be to consider complementary agricultural uses as a transition between existing urban development and farm operations. Encouragement of other farm uses, where permitted by the Agricultural Land Commission, may provide an opportunity to make a change on farm properties that could reduce conflict and not impact farm economics in a negative manner. Consideration of buffers in this manner should not be construed as support for subdivision to smaller agricultural units.

Parcel Size: Agricultural Land

The current minimum parcel size for the general agricultural zone in the Kelowna Zoning Bylaw is 2.0 ha. (5 acres). Larger parcel sizes generally support a wider range of cropping options. The MAF suggests the following parcel sizes for various commodities in terms of minimum farm unit sizes:

Tree Fruits	- 6 to 8 ha. (15 to 20 acre) minimum
Grapes	- 4 ha. (10 acre) minimum - (prefer 6 – 8 ha.)
Vegetables	- 2 ha. (5 acre) minimum
Berries	- 2 ha. (5 acre) minimum

Approximately 35 % of the land in the ALR in Kelowna is in small parcel sizes (e.g. less than 5 ha). The small sizes tend to limit agriculture cropping options because of restrictions due to economic considerations (e.g. operating capital). The value of agricultural production may also be insufficient for supporting a farm family and off-site income is required. To enhance the value of the ALR for agriculture, the subdivisions of agricultural land into smaller parcels should be generally discouraged, except where positive benefits to agriculture can be shown.

Smaller lot sizes also add to the speculative value of surrounding agricultural lands, and speculation weakens farmer capitalization. The establishment of transition areas, of smaller lots sizes for hobby farms or as buffers with compatible land uses, may be of some benefit or increase speculation. It would be appropriate to request the Ministry of Agriculture and Food to monitor productivity as related to lot size and density of plantings to provide further information with respect to economic farm units. Any future consideration of support for smaller agricultural lots or transition development should be based on evidence that smaller units are viable farm operations.

Parcel Size: Non - Agricultural Land

Growth and development in non-agricultural areas beyond the currently farmed areas inside and outside the City creates impacts, particularly traffic impacts, that make it more difficult for farmers to conduct business in a normal manner.

While recognizing that the minimum parcel size within the City of Kelowna is 2.0 ha (5.0 ac.), it may be appropriate to discourage subdivision to smaller parcel sizes beyond agricultural areas in order to reduce negative impacts on the farming community. In this regard, it may also be appropriate to encourage the Central Okanagan Regional District

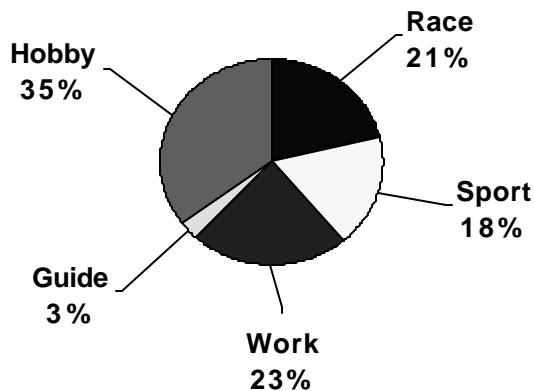
and the Ministry of Environment, Land and Parks to consider maintaining larger minimum parcel sizes for Crown Lands within and adjacent to the City in recognition of the provincial interest in retaining farming.

Equestrian Precinct

According to a Ministry of Agriculture and Food publication entitled "B.C. Horses: A Significant Agricultural Activity" by Mark Robbins, the B.C. horse industry is large, will continue to grow, and is a major user of small land parcels around urban areas. Horses are a commodity, they use other agricultural products, and support feed and equipment dealers, veterinarians, and other farm based goods and services.

The Okanagan has the second highest horse population in B.C. behind the lower mainland area and the trend indicates declining horse ownership in more remote areas with an increase around more urban areas. This shift has occurred primarily due to growth in the recreational (hobby) aspects of the horse industry. **Figure 1** indicates the percentage of horse ownership in B.C. by the type of activity (sector). The racing, sport, work, and guiding sectors are considered as the horse business side and accounts for 65 % of horse ownership and 68 % of economic activity. The recreational (hobby) sector accounts for 35 % of horse ownership and 32 % of the economic activity.

Figure 1 - Horses in B.C. - Percentage by Sector



Source: B.C. Horses: A Significant Agricultural Activity, Mark Robbins, Ministry of Agriculture, Fisheries, and Food, 1994.

The industry can be viewed alternately as one that is a viable use of small holdings that enhances the rural atmosphere, provides effective buffers, and preserves land for future production or one where the rural residential lifestyle often associated with recreational equestrian activity, increases the value of land.

Within the City of Kelowna, there are several areas that have become equestrian oriented, although there are numerous parcels all over Kelowna where the owners keep horses for business or recreation. Gordon Drive / Casorso Road area north of Mission

Creek, Gallagher Road area, and north of Sexsmith Road west of Highway 97 are locations where equestrian activities dominate the rural landscape.

The horse industry may provide an opportunity for transition or buffering from more intensive urban uses while maintaining compatibility with other agricultural pursuits. In addition, location in a transition area provides an opportunity for other uses, such as veterinary services, in close proximity to the urban community without the need for access through other farm areas where traffic impacts may be a concern. Operations of this nature may also be viable industry that preserves the land base as agricultural.

However, smaller lot sizes tend to limit agriculture cropping options, and add to the speculative value of surrounding agricultural lands, which weakens farmer capitalization. The fewer cropping options on smaller parcels means that a number of parcels would need to be acquired, to maintain viability for other agricultural pursuits, and the higher value of smaller parcels could be prohibitive.

The notion of creating and promoting an equestrian precinct may have the benefit of targeting this type of use to a specific area so that there is reduced impact on other agricultural areas. However, if the impact is one that reduces the future potential of those and adjacent lands, that would be inappropriate.

It would be more appropriate to support equestrian activities by encouraging such uses to locate in rural areas where the impact on farmland would be minimal. The creation of smaller lots as a transition, for equestrian uses or other hobby farm pursuits, should not be supported and the subdivision of agricultural land into smaller parcels, in general, should be discouraged, in order to preserve the wider cropping option potential of larger parcels.

Gravel Extraction

The Kelowna Official Community Plan identified the general location of known and probable sand and gravel deposits based on information received from the Department of Energy, Mines, and Resources. In addition, the OCP established several policies relating to sand and gravel resources that seek to limit gravel extraction on ALR lands and using sources outside the ALR before considering sites in the ALR. The OCP also recommends the preparation of a detailed inventory and a strategy for ensuring adequate supplies for the future.

The City has established a budget for this project and it is anticipated a Sand and Gravel Inventory and Strategy study will be completed in 1999. Upon completion of that project, any potential bearing on agricultural activities within the City will be reviewed in the context of the Agriculture Plan.

ALR Application criteria

The Agriculture Plan notwithstanding, any property owner has the legal right to apply to for the exclusion, subdivision, or non-farm use of land within the ALR. Applications are reviewed by the City, with comments and/or recommendations forwarded to the Provincial Agricultural Land Commission for a decision. Any application, where land in the ALR is zoned to permit agriculture or farm use in a bylaw, or an amendment to the OCP

is required, may not proceed unless authorized by a resolution of the City. The City may refuse such authorization.

The Agriculture Plan designates an urban - rural/agricultural boundary (Map 14), and within the defined agricultural area the exclusion, subdivision, or non-farm use of ALR lands will generally not be supported. General non-support for ALR applications would be in the interest of protecting farmland through retention of larger parcels, protection of the land base from impacts of urban encroachment, reducing land speculation and the cost of entering the farm business, and encouraging increased farm capitalization.

As noted above, any property owner has the right to make an application and it would be appropriate to establish criteria to assist Council in determining if authorization to proceed is warranted. Such criteria may also assist prospective applicants in determining the potential level of support prior to making an application.

Applicants should substantiate the limitations to farming (for a full range of cropping options) based on soil capability, climate, topography (slope), elevation, and/or drainage/wetland conditions. In addition to the above required background data, any City decision will use the following criteria as the basis for support or non-support of individual applications:

- Location / use context in terms of impact on adjacent agricultural properties with respect to conflict of uses and speculation/land value;
- Necessity for urban growth needs or as logical infill;
- Availability of sufficient services, particularly road access and sanitary sewer, and the impact of expansion of these services on adjacent agricultural properties;
- Benefits or sensitivity to agriculture in the form of buffering or complementary / transition uses.

Urban - Rural/Agricultural Boundary Objectives

- To establish a defined urban - rural/agricultural boundary based on agricultural suitability and on specific community park needs or isolated areas.
- To support the use of landscape buffer and fencing specifications with respect to new development adjacent to or in an agricultural context.
- To support site planning and other measures that provide urban buffers for agricultural protection.
- To encourage site development measures in agricultural areas to provide buffering where urban development already exists.
- To maintain the agricultural land base in as large a parcel size as possible.
- To support other agricultural uses as a transition or buffer between urban and rural uses.
- To support the preparation of a sand and gravel extraction policy.
- To establish policies with respect to isolated urban developments in rural areas.
- To establish policies with respect to rural areas isolated by urban development.
- To seek the approval of the Agricultural Land Commission for the non-farm use of specific lands for public park needs.
- To consider ALR application criteria.

Urban - Rural/Agricultural Boundary Policies

The City of Kelowna will:

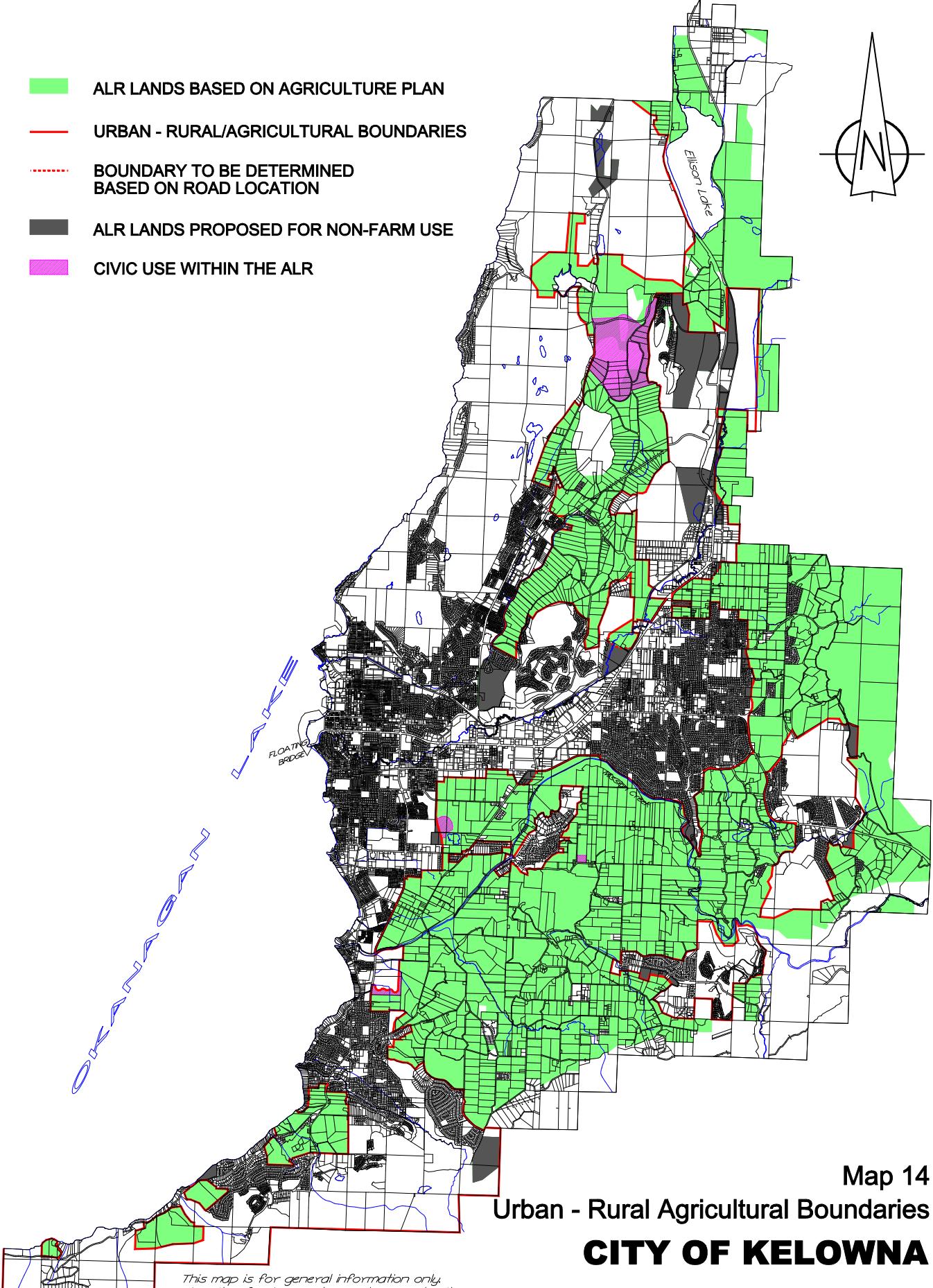
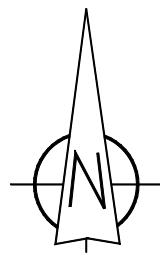
1. **Defined Urban - Rural/Agricultural Boundary.** Confirm support for the Agricultural Land Reserve and establish a defined urban - rural/agricultural boundary, as indicated on Map 14 - Urban - Rural/Agricultural Boundary, utilizing existing roads, topographic features, or watercourses wherever possible;
2. **Farmland Preservation.** Direct urban uses to land within the urban portion of the defined urban – rural / agricultural boundary, in the interest of reducing development and speculative pressure, toward the preservation of agricultural lands and discourage further extension of existing urban areas into agricultural lands;
3. **Regional Cooperation.** Continue cooperative efforts between the City of Kelowna, the District of Lake Country, and the Central Okanagan Regional District to ensure the ongoing compatibility of land uses on either side of the boundary toward the preservation of farming in the City, Lake Country, and Regional District;
4. **Landscape Buffer Specifications and Fencing Specifications.** Amend the Zoning Bylaw to include setbacks and landscape buffer and fencing requirements consistent with the Land Commission specifications, with consideration for minimum setback requirements at standard road or half road widths to support the potential need for future road, park, or public access corridors;
5. **Bonding.** Require the provision of bonding for landscape buffer and fencing requirements adjacent to agricultural lands at the time of rezoning, subdivision, and/or building permit, in accordance with the Municipal Act;
6. **Urban Buffers.** Require new development, adjacent to agricultural areas, to establish setbacks, fencing and landscape buffers on the urban side of the defined urban – rural/agricultural boundary;
7. **Site Planning Measures.** Consider the use of site planning measures such as locating internal access roads, storage areas, or other appropriate spaces between agricultural lands and proposed buildings or public use areas, for developments requiring a Development Permit;
8. **Covenants.** Consider the need for a covenant registered on the title, as part of a subdivision approval, that advises prospective buyers and land owners of the potential impact of living near farm operations and the conditions of the Farm Practices Protection (Right to Farm) Act;
9. **Disclosure.** Support amendments to the Real Estate Act that requires disclosure to prospective buyers of the potential impact of living near farm operations and the conditions of the Farm Practices Protection (Right to Farm) Act;
10. **Rural Buffers.** Encourage agricultural operators to consider buffering from urban uses, wherever possible, in the form of farm houses and other buildings not housing animals, storage areas, parking, internal roads, or other site planning measures;

11. **Transition Uses.** Consider complementary agricultural uses as a transition between existing urban development and farm operations, with consideration of such uses not to be construed as support for subdivision to smaller parcels;
12. **Parcel Size: Agricultural Land.** Discourage the subdivision of agricultural land into smaller parcels, except where positive benefits to agriculture can be demonstrated;
13. **Parcel Size: Non - Agricultural Land.** Discourage subdivision to smaller parcel sizes on lands beyond agricultural areas in order to reduce negative impacts on the farming community and encourage the Central Okanagan Regional District and the Ministry of Environment, Land and Parks to consider maintaining larger minimum parcel sizes for Crown Lands within and adjacent to the City in recognition of the provincial interest in retaining farming;
14. **Monitoring.** Request the Ministry of Agriculture and Food to monitor productivity as related to parcel size and density of plantings, with any consideration of support for smaller agricultural lots or transition development based on evidence of the viability of smaller farm units;
15. **Equestrian Precinct.** Encourage equestrian uses to locate in rural areas where the impact on productive farmland would be minimal, rather than support the creation of a specific equestrian precinct;
16. **Sand and Gravel Extraction.** Reaffirm the direction established in the OCP with respect to sand and gravel extraction in the ALR, pending completion of a Sand and Gravel Inventory and Strategy Study;
17. **Isolated Development.** In general, not support extensions to existing development or new development isolated within agricultural areas, regardless of ALR status;
18. **Marshall Feedlot.** Pursue a major road planning exercise which includes the Agricultural Land Commission, based on Land Commission conditional consent for the westerly extension of McCurdy Road, toward the exclusion of the Marshall Feedlot site south of the agreed upon road alignment, in order to resolve road network and land use conflict issues;
19. **Burtsch / Munson Road.** Pursue a memorandum of agreement with the respective property owners and the Land Commission toward resolution of road network and ALR status issues for lands to the west of the proposed Burtsch Road extension in the Munson Road area;
20. **Mission Sportsfields.** Seek the approval of the Land Commission for use of a portion of the existing Mission Sportsfields site for major district park facilities and an OCP Major Park / Open Space designation for the use of the balance of the city owned lands adjacent to the Mission Sportsfields for additional sportsfield development, based on a net agricultural benefit for adjoining farmlands as determined by the drainage management plan for the Swamp Road and Thomson Creek Sub-watersheds;

21. **Glenmore District Park.** Seek Agricultural Land Commission concurrence toward the release of ALR land to serve as a District Park site at a location that maximizes facility potential, possibly in conjunction with other civic resources;
22. **East Kelowna Ballfields.** Not pursue the development of additional sportsfields at the East Kelowna site, at this time;
23. **Other Civic Needs.** Reaffirm the direction of the OCP, as endorsed by the Land Commission, for the location of the Glenmore Landfill site and a new Sewage Treatment Plant site east of Burtch Road, within the ALR;
24. **East of Valley Road.** Encourage non-soil bound agricultural activities in the bottom lands east of Valley Road, and support the creation of smaller lots west of the toe of the slope for hobby farms, as a transition to more productive lands to the east;
25. **Summit Drive.** Continue to support the future urban use of land south of the extension of Summit Drive from Valley Road to Dilworth Mountain at this time, pending on-going discussions with the Land Commission;
26. **Springfield Road.** Continue to support the future exclusion or non-farm use of two properties south of Springfield Road between Cooper Road and Spall Road;
27. **ALR Application Criteria.** Require applicants to substantiate the marginal nature of farming (for a full range of cropping options) based on soil capability, climate, topography (slope), elevation, and/or drainage/wetland conditions. In addition to the above background data, any City decision will use the following criteria as the basis of support or non-support of individual applications:
 - Location / use context in terms of impact on adjacent agricultural properties with respect to conflict of uses and speculation/land value;
 - Necessity for urban growth needs or as logical infill;
 - Availability of sufficient services, particularly road access and sanitary sewer, and the impact of expansion of these services on adjacent agricultural properties;
 - Benefits or sensitivity to agriculture in the form of buffering or complementary / transition uses.



- ALR LANDS BASED ON AGRICULTURE PLAN
- URBAN - RURAL/AGRICULTURAL BOUNDARIES
- BOUNDARY TO BE DETERMINED
BASED ON ROAD LOCATION
- ALR LANDS PROPOSED FOR NON-FARM USE
- CIVIC USE WITHIN THE ALR



ECONOMIC ENHANCEMENT

Economic Enhancement Issues

- Economic enhancement
- Public education and promotion
- Signage
- Secondary processing
- Farmer's market
- Direct Farm Marketing
- Agri-tourism
- Role of the Provincial Agricultural Land Commission
- Role of the Ministry of Agriculture and Food
- Role of the Agricultural Advisory Committee
- Decision making

Economic enhancement

Grape Production

The grapes currently produced in the Kelowna area are predominantly winery grapes for white wine because there is a greater selection of grape varieties for white wine and most red grape varieties for wine require more heat units than is usually available in Kelowna. Wine quality is better when yields per acre are restricted, which could realize higher prices and ready markets.

The grape and wine industry should be encouraged to continue to increase the quality of grapes produced in order to advance the growing reputation of local wine products and increase their market share both locally and internationally.

Tree Fruit Production

A review of the CSMTF and SSMTF make it clear that the City of Kelowna has a selection of climates and soils suitable for a variety of tree fruits and the area suitable for tree fruit production is relatively large. Based on the maps, there is substantially more area within the City that is suited to the production of prunes & plums, apples, pears, sweet and sour cherries and hardy apricots than there is for the production of hardy or tender peaches, and tender apricots.

Current trends in agricultural management, and in particular, supported by the OVTFA administered replant program, is a change to high density plantings with dwarf trees. Because the trees are smaller and can be planted closer together, there are considerably more trees per acre. Although each tree does not produce the same amount of fruit as a larger tree, the number of trees in production provides greater yields per acre. In addition, smaller trees are significantly easier to spray, prune, and pick, providing cost savings from a management perspective.

The Province should be encouraged to continue the replant program to higher density plantings, especially in higher value varieties, specialized packaging (value added), or plant varieties that do not suffer a competitive cost disadvantage with other producing regions, such as Washington State.

Small Fruits, Vegetables, and Other Production

A variety of small fruits and vegetables are examples, in addition to the production of tree fruits or grapes, of the diversity of farm production possible on most of Kelowna's agricultural lands. Although not directly enhancing the land capability as such, promoting and fostering an awareness of the importance of these other crops will help develop an appreciation for the value of the lands in the ALR.

Horticultural specialists estimate that there is enough demand for Okanagan **strawberries, raspberries, and highbush blueberries** in Alberta to justify additional planting and local demand could justify additional planting for "U-Pick" operations.

There is strong local demand for field grown vegetables of all kinds including tomatoes and sweet corn as a "U-Pick" crop, or as crops sold via vegetable stands. The Interior Vegetable Marketing Agency Co-operative advises that increased sales opportunities exist for a selection of field grown vegetables provided that these are produced with consistency and are of top quality. Examples of crops for which the Agency has growing demand are as follows:

Potatoes of suitable quantity and quality are required by the Agency including demand for good quality bright red and clear skin yellow potatoes. The Agency buys about 900 t of potatoes annually to fulfill its commitments and to maintain its market. Sales of potatoes produced for the Agency in 1996 totaled 2970 t. The Agency has no potato storage of its own and good quality on-farm storage is required. Production technology is said to require upgrading (use of sprout inhibitors).

The Agency feels that the use of dehumidifiers and kiln dryers for **onions** instead of relying on the weather to field dry onions as is done today, would permit producers to regain lost markets and would also permit the production of the larger onions (10 to 15 cm dia.) required by the market.

All **peppers** produced and offered for sale are sold. In 1996 the Agency sold 2160 x 11 kg cartons (24 t). There is a market for more of all kinds of field grown peppers (including Hungarian peppers).

Greenhouses can produce 15 to 20 times more products per unit area than field grown crops. In addition to being used for tomato, cucumber and pepper production, greenhouses are also used for growing lettuce, radishes, other vegetable crops, and crops such as herbs and flowers including potted plants, foliage plants and bedding plants. There is, as well, a growing market for locally produced greenhouse crops including peppers, house plants and garden plants.

The Interior Vegetable Marketing Agency Cooperative advises that there may be demand for more production of **greenhouse tomatoes and cucumbers** if expansion is regulated and gradual. Sales in 1996 were 29,435 x 9 kg cartons of greenhouse tomatoes and 50,246 x 8 kg cartons of greenhouse cucumbers. The Agency regulates the production and sale of greenhouse tomatoes and cucumbers by consulting the producers who ship through the Agency. Greenhouse production of tomatoes and cucumbers return an estimated premium of 40% over field grown tomatoes or cucumbers.

Constraints to growth of the greenhouse vegetable industry are the need for three-phase power on-site, an economical source of heat (natural gas preferred), and light during the winter months. The Agency advises that Coastal greenhouse production is 50 times the size of the Interior production. However, Interior production is able to fill a need with small wholesalers because Coastal production is unable to keep up with demand. Interior marketing costs are also said to be substantially lower than Coastal costs.

There are local markets for all kinds of mushrooms according to crop advisors.

The value of organically produced products sold in the Vancouver market in 1995 is said by the Certified Organic Associations of British Columbia (COABC) to have exceeded \$80 million. Most of the products were imported.

Niche markets for medicinal herbs is an international market with demands that fluctuate wildly as buyers worldwide try to secure a yearly supplies. Local buyers have not generally received the volume or quality they need for their markets from local producers. A good business plan and market research and marketing skills are required for the successful production and sale of medicinal herbs. Buyers of medicinal herbs and roots may want these to be produced by organic methods often because pesticides needed to control pests in these crops have not yet been registered.

Medicinal herbs have recently received a lot of attention from federal regulators and Food and Drug Administration officials. License fees for the sale of medicinal herbs have increased, and regulators want to classify them as pharmaceuticals for safety reasons. Proof of any medicinal claims related to the use of herbs may be required in the future.

The Christmas tree specialist of the B.C. Ministry of Agriculture, Fisheries and Food suggests that there is enough demand in the Kelowna area to justify additional planting of **Christmas trees**. Sixty percent of households use live Christmas trees and most of these in Kelowna are imported.

Continued grower consultation with Ministry of Agriculture and Food staff regarding agricultural management, crop selection and market opportunities, and site selection for grapes, tree fruits, berries, vegetables, niche crops, and Christmas trees, including organic production, should be encouraged. In addition, inquiries regarding the interpretation of the Grape Suitability Atlas and OVTFA Tree Fruit Suitability Mapping should be directed to qualified staff at the Ministry.

The potential for increased production of vegetables of all kinds, but particularly tomatoes, corn, potatoes, onions, and field grown peppers, as well as greenhouse tomatoes and cucumbers should be encouraged through co-operative efforts of the Ministry of Agriculture and Food and the Interior Vegetable Marketing Agency Co-operative

Limitations to expansion of the Interior Vegetable Marketing Agency Co-operative operations are (1) the lack of high volume of desired crops; (2) lack of consistent quality that meets buyer demand; and (3) lack of storage and handling facilities. The Agency has recommended the establishment of distribution centres, although producers have not accepted this recommendation. The development of distribution centres would allow producers to deliver their product to one location, as needed and would also permit wholesalers to buy in one location instead of accessing producers in various locations to pick up part loads of produce. It would also allow producers to make up mixed loads in one location for direct marketing rather than driving around to many other producer farms. The Agency believes that product inspection to regulate quality in a vegetable distribution centre located in the Interior (e.g. Kelowna) would permit it to double its present business simply by providing better service and quality.

A distribution centre in Kelowna, as identified by the Interior Vegetable Marketing Agency Co-operative, should be supported to facilitate greater quality control, storage and handling capacity, and to provide an opportunity for one stop shopping for wholesalers. A facility of this nature could also provide for greater use of local produce by local major retailers who need to purchase in bulk quantities or mixed loads.

Economic opportunities for increased greenhouse production should be supported by encouraging such uses to locate on the more marginal agricultural lands, such as the east side of Valley Road, or in areas where transition uses which are compatible with both urban and farm uses, would be of benefit.

A profile of the Construction, Tourism, and Agriculture Industries, prepared by Impax Policy Services International for the Economic Development Commission of the Central Okanagan Regional District, was recently completed (May 1997). Other economic opportunities as suggested in this study, such as restructuring the tree fruit resource, corporate restructuring, simplifying wine industry regulations, networking and collaboration in the wine industry, tree fruit / wine industry linkages, and public sector technology infrastructure, would best be pursued on a valley wide basis.

Enhancement of Areas with Agricultural Capability Limitations

The summer-dry Okanagan climate including the Kelowna area means that adequate supplemental irrigation is critical for commercial agricultural production in the City of Kelowna - without irrigation, commercial agriculture would not be possible.

Poor land drainage inhibits some areas of the City from achieving their agricultural potential. The main areas are Mission-Benvoulin Flats and the area north of Reid's Corner along Mill Creek. Smaller, scattered areas occur elsewhere as well, for example along Valley Road, around Roberts Lake, and the organic soil area near Swamp Road.

Sub-Area Details

Quail Ridge - Dry Valley Area:

This ALR area lying generally west of the Kelowna Airport includes substantial land that is currently agriculturally undeveloped. The mostly undeveloped nature of the area should not be mistaken for poor agricultural capability. Increased availability of water would enhance the production capability of lands to the north of Lochrem Road. New urban development south of Lochrem Road could provide the infrastructure to make water available in the area.

The Glenmore Valley:

The lands in the vicinity of Valley Road and Cross/Longhill Roads consist of a relatively small area of poorly drained soils, with the water table partially controlled by municipal ditches. Even with adequate drainage, soil capability is still substantially curtailed (i.e. Class 4) by saline soil conditions. Improved drainage would reduce the high water tables in these heavy textured soils and salinity could be reduced over time by irrigation. This would improve the soils so that they could produce a broader selection of forage and hay, and surface rooted vegetables.

The lower slopes of the valley are considered by some to be limited for tree fruits and grapes due to potential for frost during blossoming, early fall frost and low winter temperatures. Encouragement of non-soil bound agricultural uses on these marginal lands would be more appropriate, including the potential for buffering and transition through compatible uses.

Valley Bottom from the Vicinity of Old Vernon Road North to Duck Lake:

Ongoing slight to moderate limitations vary through the area ranging from dense, clayey subsoil, to ongoing minor water table impediments. The poorly drained area occurs at least in part, due to flooding from Mill Creek. Downstream flooding may also occur due to periodic high flows. Some areas have a water table at less than 50 cm and are susceptible to flooding (e.g. in the vicinity of Bulman Road). These areas are seasonally suitable for forage and hay crops in current conditions. Artificial drainage and flood control would substantially improve the soil capability for agriculture and crop suitability. Enhancement of the natural wetland in the Kelowna Springs area could provide increased storm water storage capacity and create a natural buffer for agricultural lands to the north and east.

The East Rutland Benches:

The eastern portion extending to the eastern City boundary and including the valley between Black Knight and Iron Mountains is currently undeveloped and used mostly for native grazing due to irrigation not being available. Portions of the land adjacent to the eastern City boundary have lower capabilities due to increasingly steep topography and shallowness to bedrock. Bringing water to the un-irrigated area east of the present BMID boundary would likely be more expensive than the probable returns from agricultural activities on these lands. The retention of the grazing and forage use in the area would be appropriate.

Benvoulin Flats - Mission Creek Area:

This area is the largest in the City with soil drainage impediments. Poor soil drainage is most limiting during the spring and early summer periods due to snow melt and high levels in Okanagan Lake and Mission Creek. Seepage from the bench lands also contributes to poor drainage on the adjacent lowlands. The area generally south of Casorso Road and south of Mission Creek including the City's playing fields and Michaelbrook Golf Course and the organic soils in the vicinity of Swamp Road periodically flood in the early summer during freshet runoff in Mission Creek.

Improved drainage of the entire area is needed to improve the agriculture capability and crop suitability of the land. During parts of the summer, irrigation is required on the affected lands as well.

Southeast Kelowna Area:

The ongoing limitations reflect the extra expertise required to manage irrigation on these coarse textured soils, as well as topographic limitations and stoniness in some locations. Some land scattered through Southeast Kelowna is currently undeveloped for agriculture (e.g. that located near the intersection of Dehart and Crawford Roads). These lands are generally undeveloped not because of low agricultural capability but for other reasons such as lack of irrigation water. The potential to enhance the capability of the Crawford / Dehart area through the provision of water, possibly through assistance from additional urban development in the area, should be pursued, recognizing that the ultimate users of the water would need to pay for the service.

Public Education and Promotion

The Okanagan Valley (including the Kelowna area) is widely known for the production of tree fruits and grapes. Many people assume that if the land has low or poor suitability/capability for these crops then the land has little agricultural value. Areas not particularly suited to tree fruit production are often suited to other crops such as hay and forage, cereals, vegetables, berries, Christmas trees, niche crops, greenhouse crops, mushrooms, or various kinds of livestock including poultry and exotic animals. Although not directly enhancing the land capability as such, promoting and fostering an awareness of the importance of these other crops will help develop an appreciation for the value of the lands in the ALR.

The Central Okanagan Agricultural Awareness Society (COAAS) was registered as a society in 1994 to promote heightened public awareness of the value and the role of agriculture to the economic and social health of the Central Okanagan Region.

A project to determine if support exists for the enhancement of agriculture activities through the establishment of a position of coordinator was recently completed. The project was to assess current awareness initiatives in CORD and other jurisdictions, document the economic contribution of agriculture, and recommend options for an action and implementation plan. The results of that exercise indicate a preferred option of

creating a full time coordinator position by seeking financial support from industry, individual farmer, member organizations, and government.

The City of Kelowna could consider some form of support for COAAS, either direct financial support toward a full time coordinator, or possibly contributions in kind, in the form of assistance with advertising, communications, publications, etc.

The Okanagan Valley wine industry has become much more successful, due to not only providing a quality product, but also through promoting itself and these efforts should be supported and encouraged to continue. The tree fruit and vegetable industries should be encouraged to become more proactive in this manner, and not only educate the community as to the role and value of agriculture, but promote the business of agriculture.

Through the establishment of such things as "Agriculture Week", combined with educational brochures that encourage the community to support agriculture by buying local produce in season, and product tasting of new or exotic varieties, tours to U-pick sites or farm retail sales locations, blossom excursions, etc. the profile of agriculture could be raised. City should, in conjunction with, MAF, BCFG / BCTF, OVTFA, EDC, Chamber of Commerce, and COAAS, consider the preparation of information brochures that promote the local agriculture industry.

The recommendations for disease and pest control are provided to the agricultural industry via Production Guides. There are many potential products listed in the Tree Fruit Production Guide and the Grape Management Guide because the recommendations are made for these crops in all parts of the province. Local advisors provide farmers with information regarding the suitability of individual products for their circumstances. Only a few of the products available are actually used in an average year in the Kelowna area, however, there may be a public perception that any product used in an agricultural operation is dangerous or the method and timing of application is a concern. The creation of educational pamphlets that outline the types of products used, time of year, and toxicity may be appropriate to help diffuse some of the negative connotation of living near agricultural operations. The public should also be made aware that Provincial regulations require that users of dangerous pesticides obtain an applicators license. Perhaps a coordinated effort to produce educational brochures, in conjunction with the Central Okanagan Agricultural Awareness Society, CORD, MAF, and BCFG, would be appropriate. In addition, it would be appropriate to encourage the farming community to provide some notification to adjoining residents, where applicable, when application of fertilizers and pesticides is to take place. Greater communication in this regard could be a positive step in reducing potential conflict.

One of the attractions for many people choosing to live in the Okanagan is the ability to have fruit trees right in their own backyard. These trees need to be maintained in a similar fashion to commercial orchards or the problem of diseases and pests will be impossible to control and efforts by farmers will be undermined. Any educational brochures and programs designed to provide information regarding the hazards of fertilizer and pesticide use should also include information for urban residential property owners, regarding the importance and methods of fruit tree maintenance.

Signage

The issue of signage as related to agriculture encompasses several areas: signage related to traffic safety in agricultural areas, signage related to sensitivity to agricultural operations, and signage related to farm businesses. Signage for safety or agriculture area awareness has been discussed under the Transportation Chapter. This discussion relates to the need for signage that advertises or directs people to specific areas or farm businesses toward the enhancement of those businesses.

On-site signs advertising a specific farm business are regulated by the City of Kelowna Sign Bylaw. Off-site signage, generally within the public road right-of-way, is regulated by either the City or the Ministry of Transportation and Highways.

As part of the general direction of enhancing agriculture the Land Commission and the City have, and will continue, to investigate and modify the regulations toward increasing the ability of farmers to supplement their income from sources other than strictly growing or producing a farm product. To that end, Land Commission policies and City zoning have or will reflect changes for such uses as bed and breakfast, home occupations, farm retail sales, and other direct farm marketing or agri-tourism related businesses. In order for these businesses to survive they need to be able to advertise or otherwise direct people to the business in question, and that includes off-site signage.

The issue is complicated by the concern that excessive signage, particularly in rural areas, detracts from the visual character of the area and may create competitive circumstances that interfere with signage necessary for route information or safety needs. Visual character could also be threatened by a lack of coordination or standards for such signage.

The City should, in conjunction with the Ministry of Transportation and Highways, the Ministry of Agriculture and Food, Central Okanagan Regional District, and the Direct Farm Marketing Association, coordinate a process to investigate and establish standards with respect to the form of agricultural business signage. The process should also include consideration of appropriate locations for such signage, policy direction on combination, clustering, or grouping of signs, and an implementation procedure.

Secondary Processing

Current Land Commission regulations allow certain types of on-farm processing, including some processing of off-farm produce when combined with farm produce. On farm processing of farm products may include cleaning, sorting, separating, grading, packing, size reduction, mixing, drying, heat treatment, cold treatments, chemical and biological treatment. There may be other limited secondary processing possibilities, particularly in the expanding niche crop market, with such ideas as pre-cut, packaged salad mixes, pre-peeled and pre-cut packaged vegetables, frozen organic vegetables, baby vegetables, jams, jellies, salsa, preserves, dried flowers, various juices (apple, current, others), specialty items such as Oyster or Shiitake mushrooms, garlic and ethnic vegetables.

The entrepreneurial flexibility to generate ideas needs to be encouraged through a willingness to consider these ideas as an opportunity to expand the traditional definition of agriculture, in the interest of preserving farmers and farmland. The City and the Land Commission should continue to consider farm business ideas with merit, that may include some limited secondary processing as supplemental to farming, and where there is minimal impact on the continuing farm operation or surrounding operations.

Farmer's Market

As local growers and producers continue to operate in a marketplace that is subject to much competition and the vagaries of the weather, there will likely be the need to find other avenues to supplement farm income. In addition to the possibilities of destination type direct farm marketing and agri-tourism uses, the ability to market produce and other farm related products locally could provide another source of income. In order to attract sufficient numbers of people to buy such products, a central location where numerous products are available would be preferable. Development of a farmers market may also support the sale of produce at near retail prices, thereby, providing greater profit margin for growers to offset the costs of transportation.

Currently there is a temporary Farmer's Market that operates twice a week from the Orchard Park parking lot on the northeast corner of Dilworth Drive and Springfield Road.

As this operation is on land that is currently used as a parking lot that may have some future development use, the long term potential for continuing in this location is questionable. However, the notion of locating in a central area accessible to a large portion of the community is integral to the survival of such a seasonal operation.

A Farmers Market on a non-ALR site, or on an ALR site located near the urban – rural edge and not detrimental to adjacent agricultural operations would be preferable. In addition, any potential site should be located in close proximity to a major town centre and accessible from a major city arterial road that carries the significant volumes of traffic necessary to support such a business.

The creation of a permanent Farmer's Market that provides a convenient, accessible location that does not significantly intrude into agricultural areas would be of benefit to the agricultural community. In addition, such a use could provide a substantial buffer that protects adjoining agricultural uses while retaining an agricultural component on the land. It may also be possible to pursue a demonstration agriculture project in conjunction with a farmers market to provide educational, tourism, and buffering opportunities.

The City of Kelowna supports the concept of establishing a permanent farmers market in an accessible, central location and invites the business and development community to come forward with ideas for consideration. It may also be appropriate for government, or a consortium of interests such as the Land Commission, Ministry of Agriculture and Food, BC Fruit Growers Association, Interior Vegetable Marketing Agency Co-operative, BC Wine Institute, Central Okanagan Agricultural Awareness Society, and others to consider the potential of creating such a facility. The City should also coordinate discussions directed at determining the potential for such a facility and the potential for involvement of other agencies or a local champion.

Direct Farm Marketing

Direct Marketing provides a method for farm businesses to increase farm income. The Kelowna Farmers and Crafters Market (a co-op) is a direct farm marketing organization. The Southern Interior Farm Marketing Association is another that has member farms in the City as well as other areas of the Okanagan/Similkameen Valleys and promotes its members' products and is more involved in Agri-Tourism. Some producers are members of both organizations.

Direct marketing has many facets. It includes marketing of the farm operation itself as farm entertainment or destination, or the sale of farm produce from individual roadside stands, roadside markets, and pick-your-own operations (PYO). Some operations can include a restaurant, winery lounge, bakery, processing facility, or other related business on site.

Community farmers markets are usually located in a central location and are often managed on a co-operative basis. They are also sometimes owned and operated by an individual, corporation or municipality and are often supported by service clubs, local business organizations and Chambers of Commerce.

Less frequent practices of direct marketing include gift baskets and mail order sales, direct sales to retail outlets; rent-a-tree or vine; and land rental of garden plots (allotment gardens). Many direct marketing operations combine a variety of efforts to achieve success. Some farm operations use on-farm processing to add value to their products. A wide selection of farm products can be processed including leather, wool and wood products. All of these operations provide a form of community supported agriculture. Direct marketers must adhere to local, provincial and federal regulations.

The intent of the definition of "farm operation" in the provincial Farm Practices Protection (Right to Farm) Act (FPPA) is to support the production, processing and marketing of products produced on the farm and, within limits, of products not directly produced on the farm. The limits of sale of processed farm products or fresh products not produced on the farm are partially set by the Agricultural Land Commission Certificate of General Order #726/95 and are contained in part, within the intent of the FPPA.

The kinds and origin of farm products processed on the farm are included within the intent of the FPPA. Output processing means the processing of products produced on the farm to add value such as washing, grading, packing and storage, or processing into juice, leather, wine, alfalfa pellets, compost, etc. Input processing refers to the processing of material brought onto the farm and consumed on the farm as part of the farm operation (such as compost for mushrooms, milling of food stock for animal feed, mixing sand and wood or other soil amendments for greenhouse or nursery crops, etc.). Other forms of output processing (such as other farmers products brought onto the farm to combine with a farmers product, or to extend the processing season) have maximum proportions by volume (50 %) of off-farm ingredients that can be combined with the farmers own products over a calendar year.

The City of Kelowna will continue to address the needs of local farmers through support for a variety of direct farm marketing, as provided for within the Land Commission regulations, local Zoning regulations, and support for additional measures such as increased secondary processing, farm business signage, and farm business brochures. Assistance to the local Direct Farm Marketing associations, perhaps through the Central Okanagan Agricultural Awareness Society, to advertise and prepare brochures could also be encouraged.

Agri-tourism

The agriculture industry, in general, is suffering from declining incomes and employment, an uncertain economic future, and increasing interest in urban development within rural areas. Part of the solution for this situation is the notion of supplementing farm income through economic diversification of the farm business. Diversification in the form of **agri-tourism** requires little in the way of major investment and relies on the existing infrastructure and agrarian landscape.

Agri-Tourism involves direct marketing, and expands the concept of the farm as an entertainment, educational, or destination point in order to diversify the farm operation and the farm sources of income. Agri-tourism is recognized world-wide as a legitimate way to enhance farm income and thereby contribute to the stability of rural areas. Many farmers want to capitalize on the rural lifestyle by offering city dwellers the opportunity to experience farm life and products. Activities may include: traditional road side stands, hay rides, farm tours, cross-country ski trails, ice skating, festivals to celebrate blossom time or harvest; promotional activities such as wine festivals; on farm dining or product tasting; educational tours for schools and outings for seniors; on farm stays such as bed and breakfast; guest ranches; and working holidays on the farm. The Agricultural Land Commission has recently (Aug. 1997) issued an Agri-tourist Accommodation Policy that deals with agri-tourism and tourist accommodation within the ALR.

Agri-tourism is not covered by the official statistics, but it is an important contributor to the agriculture sector. Farms that pursue agri-tourism opportunities may generate a significant portion of their revenue through tours, souvenir, and product sales. Winery tours are big business, with tour buses making regular rounds of the welcoming wineries. There is a strong connection between the agriculture industry and tourism. The orchard industry has been a strong attraction for "pass through" traffic historically, while the wine industry can attract people for stays of several days or more for wine tours and tasting. In the past, the benefits have flowed more from agriculture to tourism than the reverse, but with innovations like the J-license, which allows wineries to serve meals, and agri-touring, and local retailing of specialty items, the agriculture industry may now benefit more from the strengths of tourism.

Similarly to the issues of secondary processing or direct farm marketing, the entrepreneurial flexibility to generate ideas needs to be encouraged through a willingness to consider these ideas as an opportunity to expand the traditional definition of agriculture.

There are benefits in proximity to larger urban centres in terms of increased short term visitors, however, there needs to be the potential for longer stays through marketing the area as a destination. Part of creating the destination aspect of agri-tourism is a critical mass of farm businesses, around which to base the marketing of a local agricultural identity. However, it must also be recognized that there is not room in the market place for every farm operation to cater to the tourism sector. If all farms pursued this form of income supplement, it is likely that only some would survive.

As it is, there is the strong likelihood that agri-tourism businesses will survive as much on accessibility as marketing, unless there is a destination component that supports organized tours or long term visits for farm vacations or working holidays. Although there may be some rationale for focusing the location of agri-tourism uses to more visible or accessible locations, as opposed to support for agri-tourism uses anywhere within the ALR, any farm operation has the right to pursue such uses within the context of existing provincial and City regulations. At the very least, there should be some consideration of the location as part of the farm operation business plan. In addition, the City needs to control the location of future intensive agriculture uses, given that such uses may have a negative impact on agri-tourism viability.

Agri-tourism businesses tend to be small scale, family operated businesses that are not likely to have the means to promote their businesses aggressively. Encouragement of the creation or expansion of associations representing the interests of agri-tourism businesses and direct farm marketing operations is critical to broadening the ability of these operations to market themselves and advocate for supportive policies from all levels of government, and their agencies. Assistance with organization could be provided through the auspices of the Central Okanagan Agricultural Awareness Society, including the potential for assistance with the preparation of promotional material and advertising in support of local farm businesses.

The agriculture industry, and the agri-tourism / direct farm marketing sector in particular, should be encouraged to form stronger relationships with the Chamber of Commerce and the Okanagan / Similkameen Tourism Association.

In addition to the promotion of agri-tourism and direct farm marketing businesses within the community, there needs to be consideration of an integrated approach that creates linkages to the cultural and heritage tourism sectors, in terms of marketing an identity of Kelowna. The role of the Orchard Industry Museum, in this regard, would be significant.

Finally, it must be remembered that the intention of supporting agri-tourism and direct farm marketing businesses is to realize an overall improvement to the economics of farming, without impacting the ability of adjoining farm operations to sustain their business.

Role of the Agricultural Land Commission

The Agricultural Land Commission draft publication entitled "Planning for Agriculture: The Local Contribution" describes the Agricultural Land Commission mandate as one of "preserving agricultural land as defined by the ALR, to encourage farming, and to ensure that land uses within the ALR remain compatible with agriculture. In its first 20 years, the Commission has directed most of its efforts toward achieving the preservation aspect of

its mandate. Ensuring compatibility between farm and non-farm uses has also been an important part of the Commission's work".

The local agricultural community has expressed the concern that the Land Commission has not fully considered the other aspect of their mandate, which is to encourage farming. Land Commission efforts in this regard have been expressed through ensuring the compatibility of adjoining uses, working with and through local governments on planning projects, and in some case outlining conditions in ALC decisions that enhance agriculture on a site specific basis.

In addition, the Land Commission has over time introduced or modified policies with respect to secondary uses such as bed and breakfast, farm retail sales, home occupations, and agri-tourist accommodation that provide alternatives to increase income for farmers. While not directly enhancing or encouraging farming, these initiatives do provide some potential support to assist farmers in remaining on the land, recognizing that if we do not preserve farmers it becomes even more difficult to preserve farmland.

The Land Commission has not had the budget or staff to undertake initiatives or programs to directly encourage farming, however, it is felt that the Commission may be in a better position to advocate for increased government recognition of the economic problems experienced by the farming community. The Land Commission should be encouraged to fulfill their complete mandate and the City could assist by advocating for greater senior government commitment to that end in terms of budget allocations for the Land Commission.

Role of the Ministry of Agriculture and Food

The Ministry of Agriculture and Food has been an active participant in the B.C. agriculture industry for over 100 years with responsibilities and activities within the total food industry – from farm to marketplace. Ministry functions included linking agricultural programs with other Provincial ministries and agencies, economic and marketing services exploring new opportunities, extension services providing advice and support for individual farmers, and other specialized services for field crops, tree fruits, horticulture, livestock, and poultry.

Recent provincial restructuring has seen a shift of the Ministry responsibilities and budget to a role of industry development, resource management and planning. Industry development entails working with the industry to promote self-reliance, diversification, value-added products, market development, and job creation. Resource management and planning entails maintaining or increasing land and water quality, quantity, and utilization. Ministry responsibilities also include the implementation of the Farm Practices Protection (Right to Farm) Act and the new Crop Insurance Program.

Some of the initiatives contained in this document outline the need for a greater role for the Ministry of Agriculture and Food in servicing on-going industry needs, and as an active participant promoting educational programs, providing advice and support to local farmers on local issues, and as an advocate to encourage farming in general. The participation and support of the Ministry of Agriculture and Food is seen as vital to encouraging farming and the City could assist by advocating for greater senior government commitment to that end in terms of budget allocations for the Ministry of Agriculture and Food.

Role of the Agricultural Advisory Committee

Currently the City of Kelowna has an Agricultural Advisory Committee (AAC), comprised of local members of the farming community, to provide advice to Council on agricultural issues relating to specific applications and agricultural policy.

The formal adoption of the Agriculture Plan may create a situation where there is less emphasis on the AAC to provide advice with respect to specific applications. However, there may be a greater need to formulate a process to oversee the ongoing implementation of this policy document. It is suggested that an expanded role for the AAC, including Council representation, toward enhancement of the agricultural industry and implementation of this document, would be appropriate. It would also be appropriate to consider broader representation on the AAC from sources such as the Ministry of Agriculture and Food, various marketing agencies or grower/producer organizations.

Decision Making

Currently decisions with respect to applications for exclusion, subdivision, and non-farm use of ALR lands rests with the Provincial Agricultural Land Commission. The Land Commission may enter into an agreement with a municipality to enable the local government to exercise some or all of the Commission's power to decide applications under Section 22 of the Land Commission Act. Section 22 of the Act includes decisions on the use of land within the ALR and the subdivision of land within the ALR. Section 22 does not include the power to decide on exclusion applications.

The Agriculture Plan could form the basis of an agreement under which the Land Commission would consider the delegation of some decision making powers, with respect to land use and subdivision within the ALR, to the City of Kelowna. Such an agreement would likely need to include direction on minimum parcel sizes for various uses and commodities. Kelowna City Council should consider initiation of discussions with the Land Commission in this regard.

Economic Enhancement Objectives

- To outline economic enhancement opportunities for specific crops, facilities, and programs.
- To consider specific enhancement opportunities for areas with drainage or irrigation impediments.
- To support public awareness, education, and promotion programs in the interest of enhancing agriculture.

- To promote the agriculture industry through advertising, brochures, and signage programs.
- To encourage new ideas that preserve farming through opportunities for supplementing farm income.
- To consider opportunities to provide a permanent farmers market.
- To support alternative income sources through direct farm marketing and agri-tourism initiatives.
- To consider the roles of the Provincial Agricultural Land Commission and the Ministry of Agriculture and Food.
- To consider the role of the Agricultural Advisory Committee within the City of Kelowna.
- To consider the Agriculture Plan as the basis for an agreement with the Provincial Agricultural Land Commission regarding decision making with respect to ALR matters.

Economic Enhancement Policies

The City of Kelowna will:

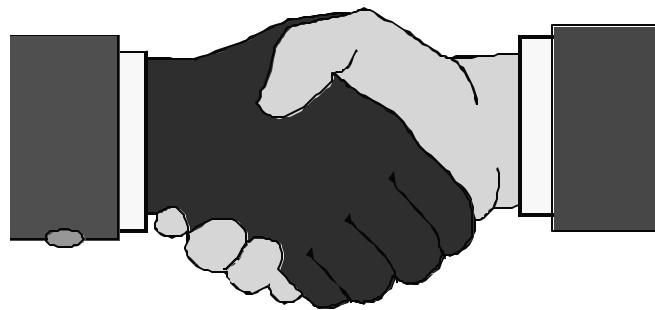
1. **Grape and Wine Industry.** Encourage the grape and wine industry to continue to increase the quality of grapes produced in order to advance the growing reputation of local wine products and increase their market share both locally and internationally;
2. **Replant Program.** Encourage the Province to continue the tree fruit replant program to higher density plantings, especially in higher value varieties, specialized packaging (value added), or plant varieties that do not suffer a competitive cost disadvantage with other producing regions, such as Washington State;
3. **Ministry of Agriculture and Food.** Encourage continued grower consultation with Ministry of Agriculture and Food staff regarding agricultural management, crop selection and market opportunities, and site selection for grapes, tree fruits, berries, vegetables, niche crops, Christmas trees, and organic production, including inquiries to qualified staff at the Ministry regarding the interpretation of the Grape Suitability Atlas and OVTFA Tree Fruit Suitability Mapping;
4. **Vegetable Production.** Encourage, through co-operative efforts of the Ministry of Agriculture and Food and the Interior Vegetable Marketing Agency Co-operative, the potential for increased production of vegetables of all kinds, but particularly tomatoes, corn, potatoes, onions, and field grown peppers, as well as greenhouse tomatoes and cucumbers;
5. **Vegetable Distribution Centre.** Support a distribution centre in Kelowna, as identified by the Interior Vegetable Marketing Agency Co-operative, to facilitate greater quality control, storage and handling capacity, and to provide an opportunity for one stop shopping for wholesalers;

6. **Greenhouse Production.** Support economic opportunities for increased greenhouse production by encouraging such uses to locate on the more marginal agricultural lands, such as the east side of Valley Road, or in areas where transition uses compatible with both urban and farm uses would be of benefit;
7. **Economic Development Commission.** Encourage the Economic Development Commission to pursue other economic opportunities, on a valley wide basis, through such initiatives as restructuring the tree fruit resource, corporate restructuring, simplifying wine industry regulations, networking and collaboration in the wine industry, tree fruit / wine industry linkages, and public sector technology infrastructure;
8. **Area North of Lochrem Road.** Require improvements to the water supply infrastructure to the lands north of Lochrem Road, through urban development of lands to the south, to enhance the production capability of the lands in the Quail Ridge – Dry Valley Road area;
9. **Valley / Longhill Road Area.** Support improved drainage for lands in the vicinity of Valley Road and Cross/Longhill Roads, to reduce the high water tables, with continued irrigation to reduce salinity over time, to support production of a broader selection of forage and hay, and surface rooted vegetables;
10. **East of Valley Road.** Encourage non-soil bound agricultural uses on the frost impacted areas east of Valley Road so that these marginal lands could be more appropriately utilized, including the potential for buffering and transition through compatible uses;
11. **Bulman Road Area.** Support channel improvements to Mill (Kelowna) Creek in the vicinity of Bulman Road to provide improved drainage and flood control, to support greater agriculture and crop suitability over the current forage and hay crops;
12. **Kelowna Springs Area.** Support enhancement of the natural wetland in the Kelowna Springs area to provide increased storm water storage capacity and create a natural buffer for agricultural lands to the north and east;
13. **East Rutland Bench Area.** Support the retention of the grazing and forage use in the area of the East Rutland Benches given that bringing water to the unirrigated area east of the present BMID boundary would likely be more expensive than the probable returns from agricultural activities on these lands;
14. **Benvoulin Flats - Mission Creek Area.** Encourage on-farm drainage improvements for the general Benvoulin Flats - Mission Creek Area and support drainage improvements in the public ditch system to assist on-farm drainage;
15. **Crawford / Dehart Area.** Support the potential enhancement of the capability of the Crawford / Dehart area through the provision of water, possibly through assistance from additional urban development in the area, recognizing that the ultimate users of the water would need to pay for the service;

16. **Central Okanagan Agricultural Awareness Society.** Consider some form of support for the Central Okanagan Agricultural Awareness Society, either as direct financial support toward a full time coordinator, or possibly contributions in kind, in the form of assistance with advertising, communications, publications, etc.;
17. **Promotion.** Encourage the tree fruit and vegetable industries to become more proactive in self promotion, and not only educate the community as to the role and value of agriculture, but also to promote the business of agriculture;
18. **Educational Brochures.** Consider, in conjunction with, MAF, BCFG / BCTF, OVTFA, EDC, Chamber of Commerce, and COAAS, the preparation of information brochures that promote the local agriculture industry through the establishment of such things as "Agriculture Week" or other festivals, combined with educational brochures that encourage the community to support agriculture by buying local produce in season, and product tasting of new or exotic varieties, tours to U-pick sites or farm retail sales locations, blossom excursions, etc.;
19. **Pesticide Educational Brochures.** Encourage and support a coordinated effort to produce educational brochures on pesticide and fertilizer uses and their impact on adjacent residential area, including the importance and methods of fruit tree maintenance in residential areas, in conjunction with the Central Okanagan Agricultural Awareness Society, CORD, MAF, and BCFG. Any brochures should also emphasize the requirements for a Pesticide Applicators License and encourage on-going education programs on pesticide and fertilizer use;
20. **Grower Communication.** Encourage the farming community to provide some notification to adjoining residents, where applicable, when application of fertilizers and pesticides is to take place, as greater communication in this regard could be a positive step in reducing potential conflict;
21. **Agriculture Signage Standards.** Coordinate, in conjunction with the Ministry of Transportation and Highways, the Ministry of Agriculture and Food, Central Okanagan Regional District, and the Direct Farm Marketing Association, a process to investigate and establish standards with respect to the form of agricultural business signage. The process should include appropriate locations for such signage, policy direction on combination, clustering, or grouping of signs, and an implementation procedure;
22. **Limited Secondary Processing.** Encourage the Land Commission to continue to consider farm business ideas with merit, that may include some limited secondary processing as supplemental to farming, and where there is minimal impact on the continuing farm operation or surrounding operations, in the interest of preserving farmers and farmland;
23. **Permanent Farmers Market.** Support the concept of establishing a permanent farmers market, on a non-ALR site or on an ALR site located near the urban – rural edge not detrimental to adjacent agricultural operations, in an accessible, central location and invite the business and development community to come forward with ideas for consideration, including the potential for a demonstration agriculture project in conjunction with a farmers market to provide educational, tourism, and buffering opportunities;

24. **Farmers Market Potential.** Coordinate discussions directed at determining the potential for a permanent farmers market facility and the potential for involvement of other agencies, or a local champion;
25. **Direct Farm Marketing.** Support direct farm marketing, as provided for within the Land Commission regulations and local Zoning regulations, and support additional measures such as increased secondary processing, farm business signage, and farm business brochures to address the needs of local farmers;
26. **Promotional Assistance.** Encourage the Central Okanagan Agricultural Awareness Society to assist the local Direct Farm Marketing associations and agri-tourism businesses with the preparation of promotional material and advertising in support of local farm businesses;
27. **Business Associations.** Encourage the creation or expansion of associations representing the interests of local agri-tourism businesses and direct farm marketing operations, as critical to broadening the ability of these operations to market themselves and advocate for supportive policies from all levels of government, and their agencies;
28. **Linkages.** Encourage the agriculture industry, and the agri-tourism / direct farm marketing sector in particular, to form stronger relationships with the Chamber of Commerce and the Okanagan / Similkameen Tourism Association;
29. **Integration.** Support the establishment of a process to consider, in addition to the promotion of agri-tourism and direct farm marketing businesses within the community, an integrated approach that creates linkages to the cultural and heritage tourism sectors, in terms of marketing an identity of Kelowna;
30. **Agricultural Land Commission.** Encourage the Agricultural Land Commission to fulfill their complete mandate of encouraging farming, and the City could assist by advocating for greater senior government commitment to that end in terms of budget allocations for the Land Commission;
31. **Ministry of Agriculture and Food.** Support the greater participation of the Ministry of Agriculture and Food, as vital to encouraging farming, and the City could assist by advocating for greater senior government commitment to that end in terms of budget allocations for the Ministry of Agriculture and Food.
32. **Agricultural Advisory Committee.** Consider an expanded role for the Agricultural Advisory Committee, including Council representation and broader representation on the AAC from sources such as the Ministry of Agriculture and Food, various marketing agencies or grower/producer organizations, toward enhancement of the agricultural industry and implementation of this document;

33. **Decision Making.** Consider initiation of discussions with the Land Commission, with the Agriculture Plan as the basis of an agreement, toward the delegation of some decision making powers, with respect to land use and subdivision within the ALR, to the City of Kelowna.



IMPLEMENTATION

Upon the adoption of the Agriculture Plan into the Official Community Plan there are a number of amendments that will need to be incorporated in the OCP and other City documents. Some of the policies are restatements of, supportive of, or expansions of current OCP policies. In addition, there are numerous follow-up actions recommended to provide on-going management of the City role in agricultural matters, as well as referrals to other agencies where specific issues are not within the City of Kelowna mandate.

Official Community Plan Amendments

Amend the **GOALS FOR KELOWNA** by replacing Goal 8 with the following two goals:

8. To maintain agriculture as a viable sector of the City's economy;
9. To preserve land within the City which is suited to agriculture now or in the long term;"

Add the following policies to Chapter 2:

- 2.4.21 Wetland Buffers.** Support the retention and use of wetlands near urban areas as natural buffers between urban and rural uses;
- 2.4.22 Natural Wetlands.** Support the retention or enhancement of existing natural wetlands within agricultural areas to provide storm water protection and water quality improvements.

Replace Policy 7.4.13 with the following:

- 7.4.13 Decision Making.** Consider initiation of discussions with the Land Commission, with the Agriculture Plan as the basis of an agreement, toward the delegation of some decision making powers, with respect to land use and subdivision within the ALR, to the City of Kelowna;

Add the following policies to Chapter 7:

- 7.4.15 Farm Practices Protection (Right to Farm) Act.** Support the provisions of the Farm Practices Protection (Right to Farm) Act, and consequential amendments to the Municipal Act and the Land Title Act, in the interest of contributing to a positive environment for farmers to conduct business;
- 7.4.16 Defined Urban - Rural/Agricultural Boundary.** Confirm support for the Agricultural Land Reserve and establish a defined urban - rural/agricultural boundary, as indicated on Map 7.2 - Urban - Rural/Agricultural Boundary, utilizing existing roads, topographic features, or watercourses wherever possible;
- 7.4.17 Farmland Preservation.** Direct urban uses to land within urban portion of the defined urban - rural / agricultural boundary, in the interest of reducing development and speculative pressure, toward the preservation of agricultural lands and discourage further extension of existing urban areas into agricultural lands;
- 7.4.18 Isolated Development.** In general, not support extensions to existing development or new development isolated within agricultural areas, regardless of ALR status;

- 7.4.19 Parcels Less Than .8 Hectares (2 Acres).** Discourage the non-farm use of parcels less than .8 hectares where such parcels are located in an agricultural area;
- 7.4.20 Intensive Agriculture.** Commit to continue a process to address the scope and methods of addressing intensive agriculture to the satisfaction of the City, the Agricultural Land Commission, and the Ministry of Agriculture and Food, before seeking the approval of the Minister responsible for the administration of the Farm Practices Protection (Right to Farm) Act;
- 7.4.21 Intensive Agriculture Zoning.** Consider a separate zone under the Zoning Bylaw for intensive agriculture uses that supports local control over location and setback requirements for livestock operations as outlined in the Watershed Stewardship publication of "A Guide for Agriculture";
- 7.4.22 Bonding.** Require the provision of bonding for landscape buffer and fencing requirements adjacent to agricultural land at the time of rezoning, subdivision, and/or building permit, in accordance with the Municipal Act;
- 7.4.23 Transition Uses.** Consider complementary agricultural uses as a transition between existing urban development and farm operations, with consideration of such uses not to be construed as support for subdivision to smaller parcels;
- 7.4.24 Parcel Size: Agricultural Land.** Discourage the subdivision of agricultural land into smaller parcels, except where positive benefits to agriculture can be demonstrated;
- 7.4.25 Central Okanagan Agricultural Awareness Society.** Consider some form of support for the Central Okanagan Agricultural Awareness Society, either as direct financial support toward a full time coordinator, or possibly contributions in kind, in the form of assistance with advertising, communications, publications, etc.;
- 7.4.26 Permanent Farmers Market.** Support the concept of establishing a permanent farmers market, on a non-ALR site or on an ALR site located near the urban – rural edge not detrimental to adjacent agricultural operations, in an accessible, central location and invite the business and development community to come forward with ideas for consideration, including the potential for a demonstration agriculture project in conjunction with a farmers market to provide educational, tourism, and buffering opportunities;
- 7.4.27 Agricultural Advisory Committee.** Consider an expanded role for the Agricultural Advisory Committee, including Council representation and broader representation on the AAC from sources such as the Ministry of Agriculture and Food, various marketing agencies or grower/producer organizations, toward enhancement of the agricultural industry and implementation of this document;

Add Map 7.2 – Urban – Rural/Agricultural Boundaries to Chapter 7.

Replace Policy 11.11.4 with the following:

11.11.4 Irrigation District Boundaries and Standards. Support the necessary amendments to Irrigation District Boundaries to allow expansion to un-serviced areas, in accord with the Kelowna Water Servicing Plan and encourage new installations to be made to City standards;

Add the following policies to Chapter 11:

11.11.7 Private Systems. Encourage the Mission Creek / Benvoulin Water Users groups, SOMID, and other private systems to continue to operate as suppliers of irrigation water for those areas intended to remain as agricultural.

11.17.5 Cost Sharing. Establish a process to consider the impact on drainage requirements of potential development outside City boundaries, and any Provincial or Regional cost sharing responsibilities.

Amend Chapter 16 as follows:

Under “Initiatives in Agriculture”,

Delete the first, second, and fourth bulleted sentences.

Add the following below the remaining bulleted sentence:

- initiate discussions with the Agricultural Land Commission toward delegation of some decision-making powers to the City of Kelowna, with the Agriculture Plan as the basis for an agreement;
- pursue as exclusion or non-farm use within the ALR, those properties identified on Map 7.2 as proposed non-farm use or civic use, plus a site for a future Glenmore District Park;
- pursue the review of those zones applicable to the ALR in cooperation with the Agricultural Land Commission and the Ministry of Agriculture and Food, and within three years seek the approval of the Minister responsible for administration of the Farm Practices Protection (Right to Farm) Act following enactment by Cabinet of a regulation under Section 713 of the Municipal Act;
- initiate discussions with the private sector regarding potential for a farmer’s market;
- expand the Terms of Reference for the Agricultural Advisory Committee to include broader representation as an implementation committee for the Agriculture Plan.

Referrals for Action

Planning and Development Services (P & D S)
 Works and Utilities (W & U)
 Parks and Leisure Services (P & L S)
 Finance and Corporate Services (F & C S)
 Ministry of Agriculture and Food (MAF)
 Agricultural Land Commission (ALC)
 Ministry of Environment, Land and Parks (MoELP)
 Ministry of Transportation and Highways (MoTH)
 Kelowna Joint Water Committee (KJWC)
 Central Okanagan Agricultural Awareness Society (COAAS)
 Central Okanagan Regional District (CORD)
 Economic Development Commission (EDC)
 B.C. Fruit Growers Association (BCFGA)

<u>Legislative Policies</u>	Action
Bed and Breakfast. Investigate any unique circumstances that would justify a request to the Land Commission to consider a local variance to Certificate of General Order #1157/93, to increase the maximum number of bedrooms to 4, for lands within the ALR, in the interest of providing an opportunity for additional farm income;	Referral: P & D S
Farm Retail Sales. Pursue an amendment to the Zoning Bylaw to include a maximum floor space of 100 square metres or one third of the farm building, whichever is less, for the sale of off-farm products, consistent with Land Commission Certificate of General Order #263/95;	Referral: P & D S - Zoning Bylaw
Heritage Resources. Request the Land Commission to consider increased parcel sizes for home site severance involving a heritage resource, to preserve the agricultural character of the setting;	Referral: P & D S and ALC
Secondary Suites. Support the provision of secondary suites in agricultural areas as per Land Commission Policy # 770/98, which allows one suite per parcel, substantially within the footprint of an existing or proposed single family dwelling provided it is clearly secondary to the single family dwelling. Suites in accessory buildings or enlarging the footprint of an existing residence for a suite would require an ALC application;	Referral: P & D S
Regional Growth Strategy. Review the Agriculture Plan for consistency with the Regional Growth Strategy when that initiative has been approved by the Central Okanagan Regional District and accepted by local governments;	Referral: P & D S
Farm Development Permit Areas. Not pursue amendments to the Official Community Plan regarding the establishment of development permit areas for the protection of farming, at this time, in favour of implementing buffer, fencing, and landscaping requirements through the Zoning Bylaw;	Referral: P & D S – Zoning Bylaw
Definition. Support a definition of intensive agriculture in the Zoning Bylaw that does not include normal farm practices that might be considered as objectionable by some, now or in the future;	Referral: P & D S – Zoning Bylaw
Additional Residences for Farm Help. (New policy will be based on forthcoming data from Ministry of Agriculture and Food)	Referral: P & D S (Inspections)

Non - Active Farms. Investigate and pursue, in conjunction with the Central Okanagan Regional District, the establishment of an non - active farm bylaw to promote increased maintenance and pest control in farm areas, except for active orchards and organic operations, including potential application for residential fruit trees maintenance, with administration of the Bylaw by the Regional District;	Referral: P & D S and CORD
Residential Fruit Trees. Pursue, in conjunction with the Central Okanagan Regional District, the creation of educational programs and brochures regarding the importance and methods of fruit tree maintenance in residential areas.	Referral: P & D S and CORD
Environmental Policies	Action
Educational Brochures. Encourage and support a coordinated effort to produce educational brochures on pesticide and fertilizer uses and their impact on adjacent residential area in conjunction with the Central Okanagan Agricultural Awareness Society, CORD, MAF, and BCFGA;	Referral: P & D S
Water Quality Monitoring. Encourage the Ministry of Environment, Lands, and Parks to resume water quality testing and monitoring functions in the interest of all other agencies and jurisdictions;	Referral: MoELP
Wetland/Stream Protection. Encourage the Ministry of Agriculture and Food, in conjunction City Watershed Educators, to provide educational opportunities for local farmers to become proactive with regard to watershed protection and habitat stewardship in tune with the Code of Agricultural Practice for Waste Management;	Referral: W & U and MAF
Wildlife Corridors. Encourage the Central Okanagan Regional District and the Ministry of Forests to consider the impacts of rural development and logging operations, respectively, on wildlife corridors and maintain appropriate corridors to avoid agricultural impacts;	Referral: CORD & Ministry of Forests
Ditch Maintenance. Encourage the Ministry of Transportation and Highways and the City to work with the agricultural community to improve flow and ditch conditions in the Benvoulin / Mission Creek / Swamp Road area, incorporating a mutual understanding of drainage and water quality objectives, toward the ability to maximize flows and a reduction of wet conditions on adjoining agricultural lands;	Referral: W & U and MoTH
Air Quality Monitoring and Regulations. Encourage the Federal Government, Ministry of Environment, Lands, and Parks, and the Central Okanagan Regional Air Quality Committee to pursue more detailed modeling of air quality to determine point source contribution levels, toward the establishment of regulations for burning impacts on air quality, to be applied in a consistent manner throughout the Region;	Referral: W & U, Regional Air Quality Committee and MoELP
Mobile Chipping. Encourage the establishment of private mobile chipping businesses, to provide an option to farmers instead of burning orchard waste;	Referral: W & U
Venting Index. Investigate, in conjunction with the Central Okanagan Regional Air Quality Committee, methods to advise the farming community of times when burning would be appropriate or not appropriate, based on a venting index, and consider a shift toward the spring or an extension to the current burning window to provide farmers sufficient time after snow melt and reduce the potential impact of burning on any given day.	Referral: W & U and Regional Air Quality Committee

Transportation Policies	Action
Agricultural Buffers. Encourage the Approving Officer to require buffers, under a restrictive covenant in favour of the City, adjacent to agricultural land in accord with the Ministry of Agriculture and Food publication "Subdivision Near Agriculture: A Guide for Approving Officers;	Referral: Approving Officer
Buffer Widths. Require that buffer widths be established at standard road or half road widths where adjoining land is not designated for development in the OCP;	Referral: Approving Officer
Road Ends. Encourage the Approving Officer to not require road ends abutting agricultural land where the land is not designated for development in the OCP;	Referral: Approving Officer
Road Maintenance Priority. Encourage the Ministry of Transportation and Highways or the City, to establish rural road maintenance priorities based on safety issues and by traffic volume and type, including agricultural, logging, and gravel extraction traffic;	Referral: W & U and MoTH
Maintenance Schedule. Encourage the Ministry of Transportation and Highways or the City, when establishing a schedule, to offset rural road maintenance from times when agricultural community needs regarding access to water are critical and from typical harvest schedules;	Referral: W & U and MoTH
Rural Road Standards. Consider amendments to the Transportation Plan to establish separate rural collector and rural local road classification and design standards, including consideration for pedestrian / bicycle / equestrian needs within the design standard, based on agricultural considerations, for inclusion in the Subdivision Bylaw;	Referral: W & U
Equestrian Routes. Consider the establishment of equestrian route mapping, on existing corridors, for inclusion in the Transportation Plan;	Referral: W & U
Road Dedications. Encourage the Approving Officer to consider the impact of road dedications on farm operations and establish dedication requirements that provide for: <ul style="list-style-type: none"> - full dedication where there is no impact on the farm operation; - road reserves where there is impact on the farm operation; - minimal dedications for home site severance or lot line adjustments, - dedications of Section 4 roads to be reviewed on a case by case basis, recognizing that the Approving Officer <u>may</u> require full dedication at the time of subdivision, based on the need to resolve safety issues; 	Referral to Approving Officer
Identification. Consider the use of painted lines for bike lanes / fog lines that identify major roads as the preferred route for non-farm traffic;	Referral: W & U
New Growth Areas. Discourage the establishment of new growth areas within or beyond agricultural areas that create additional traffic pressure on the local rural road network;	Referral: P & D S and W & U
Major Street Network. Continue the process with the Ministry of Transportation and Highways toward the establishment of a Major Street Network Plan, and expand the process to include, CORD, Lake Country, and the Land Commission;	Referral: MoTH
Safety Signage. Consider the development of signs for agricultural areas that promote the recognition of safety issues in agricultural areas with respect to hidden driveways, trucks turning, slow farm traffic, spray drift, and farm equipment crossings;	Referral: P & D S and W & U

Agricultural Signage. Consider the use of commercial / educational signs at the urban / rural interface only, that warn motorists that agricultural activity should be expected or that direct traffic to farm business / agri-tourism opportunities;	Referral: P & D S and W & U
Landscape / Ditch Maintenance. Encourage a higher level of landscape / ditch maintenance, within the public right-of-way and on private land, to improve driver sight distance and visibility at crossings, intersections, driveways, and sharp curves, and thus reduce the need for signage;	Referral: W & U
Recreational Activities. Require that race organizers establish a notification process for agricultural properties that allows the agricultural community to respond to the potential impact of their operations on recreational activities and that organizers advise all participants of potential hazards in working agricultural areas.	Referral: P & L S
<u>Water Supply Policies</u>	<u>Action</u>
Irrigation Priority. Encourage Irrigation Districts to protect the needs of the agricultural users so that they are not compromised by service extensions to non-agricultural or development lands;	Referral: KJWC
Demand Management. Encourage Irrigation Districts to implement demand side management strategies;	Referral: KJWC
Conservation. Encourage Irrigation Districts to maintain on-going water efficiency and conservation programs;	Referral: KJWC
Water Quality. Encourage water purveyors to provide water consistent with all applicable guidelines and regulations while remaining sensitive to irrigation customer needs;	Referral: KJWC
Irrigation Rates. Encourage Irrigation Districts to pursue operational strategies that maintain short term irrigation rates during uncertain economic conditions;	Referral: KJWC
Servicing Plans. Support Irrigation District long term servicing plans to supply agricultural lands should the owners want water for agricultural purposes, in accord with the Water Servicing Plan prepared for the Kelowna Joint Water Committee;	Referral: KJWC
Maintenance. Encourage the operators of private irrigation systems to restore and maintain these systems for the on-going benefit of agriculture;	Referral: private water supply groups
Update Study. Support an update of the 1979 Study by the Ministry of Environment of the Mission Creek Water Users groups irrigation systems to identify potential funding sources to assist in restoration and maintenance of the systems;	Referral: MoELP
Urban Development. Consider the extension or upgrading of water supply infrastructure through urban development towards providing irrigation service to lands north of Quail Ridge Boulevard and southwest of Dehart Road / Crawford Road, for agricultural purposes.	Referral: P & D S
<u>Drainage Policies</u>	<u>Action</u>
Mill (Kelowna) Creek. Support a program of culvert improvements, in-channel upgrades, and hydraulic improvements to alleviate occasional flooding in the Upper Mill (Kelowna Creek) Basin, as recommended in the Ellison Basins Drainage Management Plan;	Referral: W & U

Kelowna Springs. Support enhancement of the natural wetland in the Kelowna Springs area for water quality improvements and as a natural buffer between urban industrial uses and agricultural lands to the north and east, and include the Land Commission in the decision making process to establish the wetland boundary;	Referral: W & U and ALC
Airport. Consider the impact of increased bird habitat on the Kelowna Airport operations as part of any improvements to the Kelowna Springs wetland area;	Referral: W & U and F & C S
Robert Lake. Support limitations on land use in the vicinity of Robert Lake to avoid hazardous conditions and ensure storage capacity, as recommended in the Brandt's Creek Basin Study;	Referral: P & D S
Brandt's Creek. Support a program of channel improvements to the east arm of Brandt's Creek east of Valley Road, as recommended in the Brandt's Creek Basin Study;	Referral: W & U
Swamp Road. Support the retention of the natural wetland in the Swamp Road area, including the curtailing of filling activities;	Referral: P & D S
Drainage Study. Conduct a more detailed drainage study for the Swamp Road and Thomson Creek sub-watersheds, including the Mission sportsfields, to establish cost estimates for works and on-going maintenance, and to determine the potential for a net agricultural benefit to surrounding farmlands. The study should also investigate the drainage needs for and impacts of potential park development on the drainage conditions toward a drainage management plan. The potential for senior government cost sharing for the study and works, based on their interest in agricultural benefits, should also be investigated;	Referral: W & U and P & L S
Irrigation. Investigate the potential to use the drainage ditches in the Swamp Road - Thomson Creek sub-watersheds as distribution systems for irrigation water during parts of the summer;	Referral: W & U
Benvoulin Water Users Group. Include the Benvoulin Water Users Group in any decisions regarding the impact of storm water disposal on their irrigation channel;	Referral: W & U
Downstream Protection. Explore options other than detention facilities, for storm water retention, prior to using agricultural lands for downstream flood protection;	Referral: W & U
Dry Detention. Support the use of dry detention facilities, where options for storm water retention are limited and agricultural lands become targeted for detention facilities, so that some agricultural activities could still be pursued within the proposed sites;	Referral: W & U
Stormwater Policy and Design Manual. Pursue an amendment to the Stormwater Policy and Design Manual to include a requirement for development to investigate the impact of development on drainage conditions, the groundwater regime and water table conditions, including recommendations for mitigation to prevent impact to adjoining lands;	Referral: W & U
Mission Creek Dredging. Encourage the Ministry of Environment, Lands and Parks to continue to monitor the lower reaches of Mission Creek and consider dredging to lower the creek bed, when appropriate, toward the creation of a more positive drainage flow to the benefit of adjoining City and agricultural lands;	Referral: MoELP
Placement of Fill. Require, in known drainage problem areas, a drainage impact assessment by a qualified professional, to determine the likely impacts on adjoining lands and potential mitigation measures, with the level of assessment based on the magnitude of the drainage problem, depth to groundwater, and site coverage and depth of the proposed fill area.	Referral: Approving Officer and OCP revision process

Urban - Rural/Agricultural Boundary Policies	Action
Landscape Buffer Specifications and Fencing Specifications. Amend the Zoning Bylaw to include setbacks and landscape buffer and fencing requirements consistent with the Land Commission specifications, with consideration for minimum setback requirements at standard road or half road widths to support the potential need for future road, park, or public access corridors;	Referral: P & D S - Zoning Bylaw
Urban Buffers. Require new development, adjacent to agricultural areas, to establish setbacks, fencing and landscape buffers on the urban side of the defined urban – rural/agricultural boundary.	Referral: P & D S
Site Planning Measures. Consider the use of site planning measures such as locating internal access roads, storage areas, or other appropriate spaces between agricultural lands and proposed buildings or public use areas, for developments requiring a Development Permit;	Referral: P & D S
Covenants. Consider the need for a covenant registered on the title, as part of a subdivision approval, that advises prospective buyers and land owners of the potential impact of living near farm operations and the conditions of the Farm Practices Protection (Right to Farm) Act;	Referral: Approving Officer
Disclosure. Support amendments to the Real Estate Act that requires disclosure to prospective buyers of the potential impact of living near farm operations and the conditions of the Farm Practices Protection (Right to Farm) Act;	Referral: Ministry of Municipal Affairs
Rural Buffers. Encourage agricultural operators to consider buffering from urban uses, wherever possible, in the form of farm houses and other buildings not housing animals, storage areas, parking, internal roads, or other site planning measures;	Referral: P & D S
Parcel Size: Non - Agricultural Land. Discourage subdivision to smaller parcel sizes on lands beyond agricultural areas in order to reduce negative impacts on the farming community and encourage the Central Okanagan Regional District and the Ministry of Environment, Land and Parks to consider maintaining larger minimum parcel sizes for Crown Lands within and adjacent to the City in recognition of the provincial interest in retaining farming;	Referral: Approving Officer, CORD and MoELP
Monitoring. Request the Ministry of Agriculture and Food to monitor productivity as related to parcel size and density of plantings, with any consideration of support for smaller agricultural lots or transition development based on evidence of the viability of smaller farm units;	Referral: MAF
Equestrian Precinct. Encourage equestrian uses to locate in rural areas where the impact on productive farmland would be minimal, rather than support the creation of a specific equestrian precinct;	Referral: P & D S
Marshall Feedlot. Pursue a major road planning exercise which includes the Agricultural Land Commission, based on Land Commission conditional consent for the westerly extension of McCurdy Road, toward the exclusion of the Marshall Feedlot site south of the agreed upon road alignment, in order to resolve road network and land use conflict issues;	Referral: P & D S and W & U
Burtsch / Munson Road. Pursue a memorandum of agreement with the respective property owners and the Land Commission toward resolution of road network and ALR status issues for lands to the west of the proposed Burtsch Road extension in the Munson Road area;	Referral: P & D S and W & U

Mission Sportsfields. Seek the approval of the Land Commission for use of a portion of the existing Mission Sportsfields site for major district park facilities and an OCP Major Park / Open Space designation for the use of the balance of the city owned lands adjacent to the Mission Sportsfields for additional sportsfield development, based on a net agricultural benefit for adjoining farmlands as determined by the drainage management plan for the Swamp Road and Thomson Creek Sub-watersheds;	Referral: P & L S
Glenmore District Park. Seek Agricultural Land Commission concurrence toward the release of ALR land to serve as a District Park site at a location that maximizes facility potential, possibly in conjunction with other civic resources;	Referral: P & D S
East of Valley Road. Encourage non-soil bound agricultural activities in the bottom lands east of Valley Road, and support the creation of smaller lots west of the toe of the slope for hobby farms, as a transition to more productive lands to the east;	Referral: P & D S
Summit Drive. Continue to support the future urban use of land south of the extension of Summit Drive from Valley Road to Dilworth Mountain at this time, pending on-going discussions with the Land Commission;	Referral: P & D S
Springfield Road. Continue to support the future exclusion or non-farm use of two properties south of Springfield Road between Cooper Road and Spall Road;	Referral: P & D S
ALR Application Criteria. Require applicants to substantiate the marginal nature of farming (for a full range of cropping options) based on soil capability, climate, topography (slope), elevation, and/or drainage/wetland conditions. In addition to the above background data, any City decision will use the following criteria as the basis of support or non-support of individual applications: <ul style="list-style-type: none"> - Location / use context in terms of impact on adjacent agricultural properties with respect to conflict of uses and speculation/land value; - Necessity for urban growth needs or as logical infill; - Availability of sufficient services, particularly road access and sanitary sewer, and the impact of expansion of these services on adjacent agricultural properties; - Benefits or sensitivity to agriculture in the form of buffering or complementary / transition uses. 	Referral: P & D S
Economic Enhancement Policies	Action
Grape and Wine Industry. Encourage the grape and wine industry to continue to increase the quality of grapes produced in order to advance the growing reputation of local wine products and increase their market share both locally and internationally;	Referral: Grape Growers Assoc.
Replant Program. Encourage the Province to continue the tree fruit replant program to higher density plantings, especially in higher value varieties, specialized packaging (value added), or plant varieties that do not suffer a competitive cost disadvantage with other producing regions, such as Washington State;	Referral: MAF (Minister)
Ministry of Agriculture and Food. Encourage continued grower consultation with Ministry of Agriculture and Food staff regarding agricultural management, crop selection and market opportunities, and site selection for grapes, tree fruits, berries, vegetables, niche crops, Christmas trees, and organic production, including inquiries to qualified staff at the Ministry regarding the interpretation of the Grape Suitability Atlas and OVTFA Tree Fruit Suitability Mapping;	Referral: MAF (Minister)

Vegetable Production. Encourage, through co-operative efforts of the Ministry of Agriculture and Food and the Interior Vegetable Marketing Agency Co-operative, the potential for increased production of vegetables of all kinds, but particularly tomatoes, corn, potatoes, onions, and field grown peppers, as well as greenhouse tomatoes and cucumbers;	Referral: MAF and Interior Veg. Marketing Agency
Vegetable Distribution Centre. Support a distribution centre in Kelowna, as identified by the Interior Vegetable Marketing Agency Co-operative, to facilitate greater quality control, storage and handling capacity, and to provide an opportunity for one stop shopping for wholesalers;	Referral: P & S
Greenhouse Production. Support economic opportunities for increased greenhouse production by encouraging such uses to locate on the more marginal agricultural lands, such as the east side of Valley Road, or in areas where transition uses compatible with both urban and farm uses would be of benefit;	Referral: P & S
Economic Development Commission. Encourage the Economic Development Commission to pursue other economic opportunities, on a valley wide basis, through such initiatives as restructuring the tree fruit resource, corporate restructuring, simplifying wine industry regulations, networking and collaboration in the wine industry, tree fruit / wine industry linkages, and public sector technology infrastructure;	Referral: EDC
Area North of Lochrem Road. Require improvements to the water supply infrastructure to the lands north of Lochrem Road, through urban development of lands to the south, to enhance the production capability of the lands in the Quail Ridge – Dry Valley Road area;	Referral: P & S and Glenmore Ellison Irrigation District
Valley / Longhill Road Area. Support improved drainage for lands in the vicinity of Valley Road and Cross/Longhill Roads, to reduce the high water tables, with continued irrigation to reduce salinity over time, to support production of a broader selection of forage and hay, and surface rooted vegetables;	Referral: W & U
East of Valley Road. Encourage non-soil bound agricultural uses on the frost impacted areas east of Valley Road so that these marginal lands could be more appropriately utilized, including the potential for buffering and transition through compatible uses;	Referral: P & S
Bulman Road Area. Support channel improvements to Mill (Kelowna) Creek in the vicinity of Bulman Road to provide improved drainage and flood control, to support greater agriculture and crop suitability over the current forage and hay crops;	Referral: W & U
Kelowna Springs Area. Support enhancement of the natural wetland in the Kelowna Springs area to provide increased storm water storage capacity and create a natural buffer for agricultural lands to the north and east;	Referral: W & U
East Rutland Bench Area. Support the retention of the grazing and forage use in the area of the East Rutland Benches given that bringing water to the un-irrigated area east of the present BMID boundary would likely be more expensive than the probable returns from agricultural activities on these lands;	Referral: P & S
Benvoulin Flats - Mission Creek Area. Encourage on farm drainage improvements for the general Benvoulin Flats - Mission Creek Area and support drainage improvements in the public ditch system to assist on farm drainage;	Referral: W & U

Crawford / Dehart Area. Support the potential enhancement of the capability of the Crawford / Dehart area through the provision of water, possibly through assistance from additional urban development in the area, recognizing that the ultimate users of the water would need to pay for the service;	Referral: P & D S and W & U
Promotion. Encourage the tree fruit and vegetable industries to become more proactive in self promotion, and not only educate the community as to the role and value of agriculture, but also to promote the business of agriculture;	Referral: BCFGA and Interior Veg. Marketing Agency
Educational Brochures. Consider, in conjunction with, MAF, BCFGA / BCTF, OVTFA, EDC, Chamber of Commerce, and COAAS, the preparation of information brochures that promote the local agriculture industry through the establishment of such things as "Agriculture Week" or other festivals, combined with educational brochures that encourage the community to support agriculture by buying local produce in season, and product tasting of new or exotic varieties, tours to U-pick sites or farm retail sales locations, blossom excursions, etc.;	Referral: P & D S
Pesticide Educational Brochures. Encourage and support a coordinated effort to produce educational brochures on pesticide and fertilizer uses and their impact on adjacent residential area, including the importance and methods of fruit tree maintenance in residential areas, in conjunction with the Central Okanagan Agricultural Awareness Society, CORD, MAF, and BCFGA. Any brochures should also emphasize the requirements for a Pesticide Applicators License and encourage on-going education programs on pesticide and fertilizer use;	Referral: P & D S
Grower Communication. Encourage the farming community to provide some notification to adjoining residents, where applicable, when application of fertilizers and pesticides is to take place, as greater communication in this regard could be a positive step in reducing potential conflict;	Referral: MAF
Agriculture Signage Standards. Coordinate, in conjunction with the Ministry of Transportation and Highways, the Ministry of Agriculture and Food, Central Okanagan Regional District, and the Direct Farm Marketing Association, a process to investigate and establish standards with respect to the form of agricultural business signage. The process should include appropriate locations for such signage, policy direction on combination, clustering, or grouping of signs, and an implementation procedure;	Referral: P & D S
Limited Secondary Processing. Encourage the Land Commission to continue to consider farm business ideas with merit, that may include some limited secondary processing as supplemental to farming, and where there is minimal impact on the continuing farm operation or surrounding operations, in the interest of preserving farmers and farmland;	Referral: ALC
Farmers Market Potential. Coordinate discussions directed at determining the potential for a permanent farmers market facility and the potential for involvement of other agencies, or a local champion;	Referral: P & D S
Direct Farm Marketing. Support direct farm marketing, as provided for within the Land Commission regulations and local Zoning regulations, and support additional measures such as increased secondary processing, farm business signage, and farm business brochures to address the needs of local farmers;	Referral: P & D S
Promotional Assistance. Encourage the Central Okanagan Agricultural Awareness Society to assist the local Direct Farm Marketing associations and agri-tourism businesses with the preparation of promotional material and advertising in support of local farm businesses;	Referral: COAAS

Business Associations. Encourage the creation or expansion of associations representing the interests of local agri-tourism businesses and direct farm marketing operations, as critical to broadening the ability of these operations to market themselves and advocate for supportive policies from all levels of government, and their agencies;	Referral: COAAS
Linkages. Encourage the agriculture industry, and the agri-tourism / direct farm marketing sector in particular, to form stronger relationships with the Chamber of Commerce and the Okanagan / Similkameen Tourism Association;	Referral: COAAS
Integration. Support the establishment of a process to consider, in addition to the promotion of agri-tourism and direct farm marketing businesses within the community, an integrated approach that creates linkages to the cultural and heritage tourism sectors, in terms of marketing an identity of Kelowna;	Referral: P & D S and Arts Development Officer
Agricultural Land Commission. Encourage the Agricultural Land Commission to fulfill their complete mandate of encouraging farming, and the City could assist by advocating for greater senior government commitment to that end in terms of budget allocations for the Land Commission;	Referral: MAF (Minister) and ALC
Ministry of Agriculture and Food. Support the greater participation of the Ministry of Agriculture and Food, as vital to encouraging farming, and the City could assist by advocating for greater senior government commitment to that end in terms of budget allocations for the Ministry of Agriculture and Food;	Referral: MAF (Minister)

FINANCING THE PLAN

The financing aspects of the Agriculture Plan relate to a number of functions within the City of Kelowna and will impact on the budgets of these functions; Drainage, Parks, and Roads, in particular. Many of the Plan policies also advocate new issues from the perspective the City that could be investigated through an Implementation Committee.

- **Drainage**

There are a number of policies that relate to the drainage needs of the agricultural community. These needs are itemized below, along with the potential cost implications as outlined in the respective Drainage Basin Studies. All of the figures include a 45 % contingency.

The occasional flooding of farmland in the Mill Creek area near Bulman Road could be reduced, but not necessarily eliminated, through a program of culvert improvements, in-channel upgrades, and hydraulic improvements. The projected cost of these works, was \$215,000 (1995 \$).

The creation of a constructed wetland in the Kelowna Springs area would provide storm water detention capacity and water quality improvements, in addition to buffering agricultural land to the east from urban development. The projected cost of this work, was \$1,015,000 (1995 \$).

A program of channel improvements to the east arm of Brandt's Creek would provide better drainage of the low lying lands east of Valley Road and create better conditions for farming, even as hobby farms. The projected cost of this work, was \$327,000 (1992 \$).

A more detailed drainage study for the Swamp Road and Thomson Creek sub-watersheds, including the Mission Sportsfields, should be undertaken to establish cost estimates for works and on-going maintenance, toward necessary recreation improvements and extension of Mission Sportsfields and net agricultural benefits. The potential for senior government cost sharing should also be investigated.

Preliminary estimates from the Mission Creek Basin Management Plan for ditch maintenance, construction and maintenance of a diversion from the Swamp Road sub-watershed to the Thomson Creek sub-watershed and upgrades to the pumping capacity at the Mission Sportsfield wetland / detention site in these sub-watersheds is approximately \$796,500 (1996 \$)

The estimated total cost of agriculture related drainage improvements would be on the order of \$2,353,500.

There are additional drainage works identified in the Basin Management Plans, that may impact agricultural land (i.e. the use of agricultural land for detention / wetland facilities) however, these works are necessary to protect existing downstream urban areas from

flooding or to contain drainage from new development to pre-development levels. The costs of this city wide drainage network would be considerable. Funds to provide all drainage infrastructure would come from a combination of new development and general taxation, based on an overall Stormwater Management Strategy and an overall 10 Year Capital Plan that has yet to be approved as a guide.

Any overall drainage plan would likely consider the total works required over a long period of time, with budget allocations for an annual implementation plan and priority levels assigned based on safety, protection of property, and environmental needs. Agricultural drainage improvements would likely be low on the priority list.

It may be appropriate to establish an agricultural drainage strategy, outside of the larger issue of overall City drainage, that provides an annual budget allocation for these improvements over an extended time frame, as an expression of the City commitment to the Agriculture Plan and agriculture in general. In particular, the improvement of drainage conditions in the Mission Sportsfield area may provide the Provincial Agricultural Land Commission with sufficient reassurance of an overall benefit to agriculture in the area that they may be amenable to increased City utilization of the City owned lands for park and recreation facilities. Without Land Commission support the City may be obliged to seek land elsewhere, at considerably greater cost.

- **Parks**

Policies in the Agriculture Plan related to park needs are not driven by agricultural community needs but by the needs of the greater urban community. Park acquisition and improvement in Glenmore or East Kelowna would be funded from the appropriate budgets as part of the on-going management of the City parks program.

There may be an impact on the Parks budget with respect to the Mission Sportsfields development. Any need for drainage improvements constructed on City land would also benefit the park site and may require an annual budget allocation by Parks for drainage management in the area. In addition, the issue of buffering adjacent agricultural uses from the City land may also be an impact on the Parks budget in terms of landscaping, fencing etc.

- **Roads**

There is a benefit to agriculture in improved road and ditch maintenance, which is a public responsibility. The maintenance of rural roads, including rural drainage ditches and landscape elements within the right-of-way, would be contained within the overall City road maintenance budget, when the City is required to take over these responsibilities from the Province. This would also include the identification of major routes and bike paths through signage and painting.

The potential impact of not requiring road dedications in all circumstances could mean future acquisition costs when road improvements are deemed necessary. However, the Agriculture Plan objective of preserving farmland from development would indicate minimal need for future road dedications in rural areas because little or no development would occur to require new or widened road corridors.

- **Implementation Committee**

Another major focus in the Agriculture Plan is one of enhancement of the industry through educational programs, promotional material, and brochures on the impact of living near agriculture. The impact of pesticide and fertilizer use, watershed protection and habitat stewardship for farmers, educational brochures to promote agriculture, and residential fruit tree maintenance is also discussed.

Numerous policies speak to the preparation of educational brochures or promotional material, often in conjunction with other agencies. These agencies would include the Ministry of Agriculture and Food, Central Okanagan Regional District, B.C. Fruit Growers Association, Economic Development Commission, Chamber of Commerce, other grower groups or marketing agencies, and the Central Okanagan Agricultural Awareness Society.

Other potential programs for agricultural signage, including development of standards, and support for a full time agricultural coordinator through the Central Okanagan Agricultural Awareness Society are also advocated.

It would be appropriate to consider an expanded role for the Agricultural Advisory Committee as an Implementation Committee for the Agriculture Plan. The use of the remaining funds in the Agriculture Plan budget, over a one or two year time frame, to begin the preparation of some of the educational and promotional material discussed could also be considered. The Agriculture Plan budget will likely have on the order of \$25,000 to \$30,000 left at the conclusion of the process.

It would also be appropriate for the Committee to investigate the implications of these policies, including potential financial needs, for recommendations to Council for an annual budget allocation, in the interest of demonstrating the on-going City of Kelowna commitment to agriculture.

REFERENCES

- Agricultural Land Capability Review and Cropping Options Study; H.A. Luttmerding, J. Vielvoye; 1997.
- Agriculture Awareness in the Central Okanagan; Greenaway Thomson Communications Ltd.; 1996.
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- Annual Report; B.C. Wine Institute; 1996/97.
- Annual Report; Sun-Rype Products Ltd.; 1996.
- Annual Reports and Financial Statements; B.C. Fruit Packers Co-operative; 1996 / 97.
- B.C. Horses: A Significant Agricultural Activity; Mark Robbins, 1994.
- Brandt's Creek Basin Study; Dayton and Knight; 1992.
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APPENDIX I

1991 Census of Agriculture, Statistics Canada. Selected Variables
Classified by Product Type - Central Okanagan Subdivision A

Type of Farm or Product	No. of Farms	Total Farm Area - Acres	Average Total Farm Area	Total Capital Value	Total Gross Farm Receipts	Total Farm Operating Expenses	Gross Farm Receipts - Total Expenses
Dairy	5	70	14	1,197,118	5,680	34,656	-28,976
Cattle	43	21,826	508	30,090,620	1,879,087	1,436,863	442,224
Hog Farms	-	-	-	-	-	-	-
Poultry	3	104	35	1,445,563	865,331	659,081	206,250
Sheep	5	45	9	1,101,511	15,217	35,091	-19,874
Goat	-	-	-	-	-	-	-
Horse	56	1,233	22	21,860,006	825,615	891,861	-66,246
Fur	-	-	-	-	-	-	-
Other Specialty Animals	5	44	9	1,408,615	178,930	177,762	1,168
Wheat	2	-	-	-	-	-	-
Oilseed	-	-	-	-	-	-	-
Grain Corn	-	-	-	-	-	-	-
Field Pea & Bean	-	-	-	-	-	-	-
Small Grain	-	-	-	-	-	-	-
Fodder	36	1,090	30	10,445,425	416,460	482,690	-66,230
Forage Seed	-	-	-	-	-	-	-
Tobacco	-	-	-	-	-	-	-
Potatoes	1	-	-	-	-	-	-
Other Field Crops	-	-	-	-	-	-	-
Tree fruits	318	9,061	28	165,384,566	16,657,567	15,470,103	1,179,464

continued

1991 Census of Agriculture, Statistics Canada. Selected Variables
Classified by Product Type - Central Okanagan Subdivision A (cont'd)

Type of Farm or Product	No. of Farms	Total Farm Area - Acres	Average Total Farm Area	Total Capital Value	Total Gross Farm Receipts	Total Farm Operating Expenses	Gross Farm Receipts - Total Expenses
Grapes	25	1,439	58	19,910,443	1,197,916	1,104,903	93,013
Other fruit	11	275	25	4,717,525	258,352	301,129	57,223
Vegetables	22	253	12	7,231,838	688,622	528,727	159,895
Fruit & Vegetables	3	49	16	572,476	38,088	44,804	-6,714
Mushrooms	1	-	-	-	-	-	-
Greenhouse Tomatoes	-	-	-	-	-	-	-
Greenhouse Lettuce	-	-	-	-	-	-	-
Other green-house crops	6	96	16	1,907,238	1,186,648	733,103	453,545
Nursery Products	19	146	8	7,084,615	698,001	727,023	-29,022
Sod	2	-	-	-	-	-	-
Maple Tappings	-	-	-	-	-	-	-
Cattle & Hogs	1	-	-	-	-	-	-
Cattle, Hogs & Sheep	-	-	-	-	-	-	-
Livestock Combinations	7	176	25	2,843,644	23,291	38,959	-15,668
Crop com-binations	1	-	-	-	-	-	-
Other com-binations	9	64	9	3,024,968	233,992	298,756	-56,764
Total	581	36,731	63	288,392,081	25,919,225	23,312,094	2,607,131

1996 Census of Agriculture, Statistics Canada. Selected Variables
Classified by Product Type - Central Okanagan Subdivision A

Type of Farm or Product	No. of Farms	Total Farm Area - Acres	Average Total Farm Area	Total Capital Value	Total Gross Farm Receipts	Total Farm Operating Expenses	Gross Farm Receipts - Total Expenses
Dairy	3	947	316	9,478,578	36,831	36,260	571
Cattle	33	34,997	1,061	31,366,761	1,084,122	1,294,207	-210,085
Poultry	11	162	15	4,424,624	1,023,971	1,053,359	-29,388
Sheep	6	80	13	2,134,885	21,408	40,505	-19,097
Goats	1	-	-	-	-	-	-
Horses	67	1,424	21	35,220,965	709,828	1,250,301	- 540,473
Other Specialty Animals	8	397	50	7,975,734	456,674	479,135	- 23,459
Wheat	2	-	-	-	-	-	-
Fodder	43	1,273	30	23,319,131	276,830	427,408	-148,578
Potatoes	2	-	-	-	-	-	-
Other Field Crops	6	87	15	3,110,400	1,694,750	1,555,302	139,440
Treefruits	302	7,816	26	235,363,388	21,739,094	17,909,858	3,829,236
Grapes	26	1,731	67	22,882,621	1,551,635	1,172,324	379,311
Other fruit	10	95	10	4,518,062	202,732	130,591	72,141
Vegetables	24	325	14	14,697,631	632,289	602,442	29,847
Fruit & Vegetables	2	-	-	-	-	-	-
Mushrooms	3	10	3	1,261,000	1,132,400	995,682	136,718
Other Greenhouse crops	7	148	21	4,531,035	3,097,616	2,671,609	426,007
Nursery	17	174	10	8,448,371	492,537	448,002	44,535
Sod	1	-	-	-	-	-	-

continued

**1996 Census of Agriculture, Statistics Canada. Selected Variables
Classified by Product Type - Central Okanagan Subdivision A (cont'd)**

Type of Farm or Product	No. of Farms	Total Farm Area - Acres	Average Total farm Area	Total Capital Value	Total Gross Farm Receipts	Total Farm Operating Expenses	Gross Farm Receipts - Total Expenses
Other horticulture specialty	5	51	10	1,663,500	25,295	33,867	-8,572
Cattle & hogs	1	-	-	-	-	-	-
Cattle, Hogs & Sheep	1	-	-	-	-	-	-
Livestock com - binations	10	841	84	4,839,026	57,555	133,027	-75,472
Other com - binations	7	70	10	2,351,908	150,100	104,387	45,713
Total	598	52,007	87	422,320,432	34,692,072	30,576,667	4,116,405

APPENDIX II

Water Consumption Data - 1976 to 1996

Black Mountain Irrigation District Consumption Data (da-m³)

BMD	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Irrigation	5,602	10,324	7,271	12,266	8,942	7,799	7,302	8,967	11,443	10,771	13,332	8,286	8,166	7,900	10,063	9,850	5,064	10,334	7,492	7,439	
Domestic	2,134	2,259	2,380	2,631	2,940	3,039	3,121	3,219	3,283	3,353	3,409	3,474	3,551	3,665	3,770	3,895	4,040	4,159	4,287	4,439	4,520
Totals	7,736	12,583	9,651	14,897	11,882	10,838	10,423	10,439	12,250	14,796	14,180	16,806	11,837	11,831	11,670	13,958	13,890	9,223	14,621	11,931	11,959

Glenmore-Ellison Improvement District Consumption Data (da-m³)

GEID	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Irrigation	3,976	4,134	2,127	2,810	2,111	2,968	2,724	2,536	2,757	3,109	2,807	4,416	3,439	3,278	4,010	3,047	3,220	3,564	6,005	2,486	3,776
Domestic	413	422	429	434	445	457	469	476	483	489	502	509	518	527	619	847	1,124	1,471	1,695	1,881	1,970
Totals	3,976	4,556	2,556	3,244	2,556	3,425	3,193	3,012	3,240	3,598	3,309	4,925	3,957	3,805	4,629	3,894	4,344	5,035	7,700	4,367	5,746

South East Kelowna Irrigation District Consumption Data (da-m³)

SEKID	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Irrigation	7,919	11,661	10,395	13,077	10,315	10,102	10,637	9,994	11,110	12,179	11,313	14,180	9,658	10,558	10,436	11,930	11,115	10,174	11,329	8,710	10,528
Domestic	527	546	595	634	675	740	747	807	843	884	894	938	967	999	1,080	1,116	1,173	1,194	1,245	1,308	1,351
Totals	8,446	12,207	10,990	13,771	10,990	10,842	11,384	10,801	11,953	13,043	12,207	15,118	10,625	11,557	11,516	13,046	12,288	11,368	12,574	10,018	11,879

NOTE: Glenmore and Ellison Irrigation Districts were amalgamated in 1990 so the totals after 1986 are for an expanded service area.
 Black Mountain and Scotty Creek Irrigation Districts were amalgamated in 1979 so totals after 1979 are for the expanded service area.