A GUIDE TO THE LAND EVALUATION AND AREA REVIEW (LEAR) SYSTEM FOR AGRICULTURE

AGRICULTURAL LAND USE UNIT
Resource Management Branch

ONTARIO MINISTRY OF
AGRICULTURE AND FOOD

Revised June 2002

APPENDIX 1 - A GUIDE TO LAND EVALUATION AND AREA REVIEW (LEAR) SYSTEM FOR AGRICULTURE

CITY OF GREATER SUDBURY
AGRICULTURAL REPORT

OfficialPlanofficiel

November 2004

This publication is a working draft. Municipalities and planners are encouraged to consider and apply the approach described herein to help them plan for agriculture within their Official Plan.

Rural Planners of the Ministry of Agriculture and Food are available for assistance should there be any specific questions regarding the interpretation and implementation of this Guide.

Should there be any specific comments or suggestions involving the content of this Guide, please contact an OMAF Rural Planner or the OMAF Agricultural Land Use Unit in Guelph, Ontario.

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BACKGROUND

The Province of Ontario has long been concerned with the identification and protection of its agricultural land base and farming industry. The Food Land Guidelines (1978) provided a land use planning framework which allowed local municipalities to identify significant agricultural lands for long term protection. Recent policy updates such as the Comprehensive Set of Policy Statements (1995) and Provincial Policy Statement (1996) retained this approach. In general, the planning to implement this approach involves inventorying lands with agricultural potential, and identifying the highest priority lands in contiguous designations.

Central to this process is the evaluation of the land resource based on soil capability for agriculture (Canada Land Inventory-CLI). Notwithstanding the capability rating, lands are also subjectively reviewed against several factors which could either enhance agricultural potential (e.g. irrigation systems, capital investment in farm infrastructure, tile drainage, etc.) or diminish its long-term capability for food production (e.g. property fragmentation, intrusion of non-farm uses, etc.).

While this approach to the identification of provincially significant agricultural, land has been widely adopted across the Province, the methodology has long been perceived by some as subjective and qualitative. Implementation and replication at the local municipal level has been variable.

To assist municipalities with the development and application of a suitable alternative system, the Province has developed the **Land Evaluation and Area Review (LEAR) System for Agriculture.** It is intended that this System will serve as the provincial standard and provide a basis for the development of municipal LEAR programs. A municipality has the opportunity to modify the LEAR system to reflect the agricultural situation in its specific area. Ontario Ministry of Agriculture and Food (OMAF) staff is available to work with any municipality on the adaptation of the system to a local area so as to ensure that provincial policy can be achieved.

In this way, the LEAR System represents both a flexible and co-operative approach to the identification of prime agricultural areas. Local initiative and input is fundamental to the development and implementation of a successful evaluation system.

The GOAL of a land evaluation system is to identify prime agricultural areas for the purposes of establishing an agricultural designation in a municipal OFFICIAL PLAN.

INTRODUCTION

The intent of this Guide is to provide direction for the preparation and use of a system for Land Evaluation and Area Review for Agriculture, hereafter referred to as LEAR.

The LEAR consists of two parts:

1. Land Evaluation (LE): The LE portion of LEAR provides a method of determining the importance of an area's soil resources in terms of their use for agriculture.

   LE includes rating the soils of the study area. The land evaluation is based on ratings established by the Canada Land Inventory **Soil Capability Classification for Agriculture** (ARDA, 1965) or the **Guidelines for Application of Canada Land Inventory Agricultural Capability Classification in Ontario** (draft 2001). It may also be based on soil suitability ratings for speciality crops.

2. Area Review (AR): The AR portion provides a method for identifying important factors, other than soils, that contribute to the suitability of the study area for agricultural activities. Factors selected reflect social, economic and environmental elements of land use (e.g. fragmentation). Each factor selected is divided into a range of possible scores in accordance with local knowledge and provincial policies.

   A local committee must determine the objectives of the LEAR system, the definition of the Study Area and the size of Evaluation Unit, with assistance from OMAF. These terms are clearly documented in APPENDIX 1 - Glossary of this Guide.

   The application of the LEAR System results in the combined LE and AR scores for each Evaluation Unit. These Evaluation Unit scores then form the basis for determining the significance of the study area for agriculture. A predominance of high Evaluation Unit scores within the Study Area is then an indicator of significant agricultural potential and suitability for long term farming activities.

The LEAR system is an alternative method for identifying prime agricultural areas, which is intended to be objective and locally driven. It is intended that LEAR will be used as part of the comprehensive Official Plan Review process. It is not intended for use in site-specific development applications and is not a methodology for circumventing the provincial goal of protecting prime agricultural areas for long-term agricultural use.

Principles for a LEAR System

The LEAR System is designed to be:

- applied consistently within a municipality. LEAR provides a framework within which LE and AR procedures are documented before a land use designation is considered and identified. Such a process permits different individuals to evaluate areas consistently over time and without bias;

- flexible to accommodate differences among regions, counties or townships;

- based on existing knowledge, utilizing soil survey information and interpretations that are widely available throughout the Province. It also uses planning concepts and principles easily understood and regularly used by those involved in land use planning;

- a tool to assist local and provincial decision makers, in making rational, consistent, and sound land-use decisions;

- sensitive of local values and objectives, by using a local work group or committee to develop the system; and

- supportable through the development of an objective system supported by sound data to evaluate land and to determine under what conditions agricultural land should be protected .

- applicable to technological and data resources of the municipality.

Uses of the LEAR System

The information resulting from the application of a LEAR system can be used for:

- identifying prime agricultural areas;
- implementing local and provincial agricultural policies; and
- preparing and updating municipal official plans.

Responsibility for LEAR System Development

(a) **Local Officials**

Elected officials, planners, interest groups, etc. are expected to work together to:

- identify and document the specific objectives for the system as well as the overall work plan;
- organize appropriate committees or working groups to address the various process components;
- be responsible for developing and testing the system.

(b) **Local Committees or Work Groups**

In most cases, one or more committee(s) or work group(s) will be organized to assist and guide the development of a LEAR system. In some areas, agricultural advisory committees already exist and new committees may not be needed.

The committee(s) may want to create separate working groups to deal with technical development of any part of the system.

Potential committee members or technical advisors to the committee may include: County, Region, Town, City and Township representatives; municipal planners; conservation authority representatives; other local government officials; agricultural leaders; farmers; representatives of farm organizations; representatives from local public-interest groups; and others with interest and knowledge of Provincial or local planning needs and goals; and staff from the OMAF Agricultural Land Use Unit.

(c) **Ontario Ministry of Agriculture and Food**

The Ministry has the capability to assist in developing a LEAR system as well as providing available information, advice and data. Ministry staff should be contacted early in the design of the system as well as throughout the process. The design of the LEAR is completed when all factors and weights are approved. It is important to obtain approval from the local committee and the municipality. As well, the Province should be consulted prior to the LEAR system application in order to prevent debate or rejection of Land Evaluation / Area Review Model after agricultural areas have been identified.

LAND EVALUATION (LE) COMPONENT

Introduction

This section outlines the objectives and various steps involved in developing and applying the LE component of the LEAR system. The LE component provides a method of determining the importance of the study area's soil resources for agriculture.

The LE component should satisfy the following **objectives**:

- determine land capability for agricultural uses;
- distinguish between classes of land of differing capability to enable the identification and mapping of prime agricultural areas;
- be consistently applicable within a study area; and
- be constant and not subject to changes in crop yields, farming methods, prices or interest rates.

The following **steps** should be taken to derive the LE component score for each Evaluation Unit.

Process

STEP 1 - Establish Purpose of LE:

Determine and document the purpose of the LE. The local committee should clearly define its goals and objectives at the outset which should have regard for the Provincial goal of identifying and protecting prime agricultural areas as part of the municipal land use planning process.

STEP 2 - Define Study Area:

Define and document the Study Area for the LE. In most cases, the Study Area will be the township, county, city or region. However, as agricultural lands may be limited to specific areas within a county or township, the LE may be prepared for only a specific part of the whole municipality.

In all situations, those lands available for agriculture should be included within the Study Area. Those lands which have been committed for non-farm uses within an approved official plan or zoning bylaw and which consist of a substantial size should be excluded (e.g. urban areas).

Smaller sites which may have been committed to non-farm uses (e.g. golf courses, seasonal residential) but are located within a larger agricultural area should be included within the LEAR Study Area. In addition, environmental features (e.g. wetlands, watercourses, forests, and aggregate areas) should be included so as to maintain consistency in determining the LE.

STEP 3 - Evaluation Units:

Identify the appropriate Evaluation Unit (EU) for the Study Area. An Evaluation Unit is the spatial unit that will serve as the basis for data collection and the analysis of soil capability ratings. Each Evaluation Unit will be assigned a LE score, an AR score and finally, a combined LEAR score. The most detailed unit of land management is based on property ownership. As such, it is recommended that municipalities use land ownership parcels as the EU, where the property assessment maps are available. Using individual properties as the unit of evaluation has a number of advantages:

- the unit of evaluation is small and as a result, the information is detailed and accurate;
- land is managed by ownership unit and most socio-economic factors are best considered in terms of the management unit;
- individual properties are assessed so the results of the soil capability and land use information are applied to the individual property and are not affected by neighboring properties which may have a higher or lower potential;
- the results of the LEAR can be explained to the farmers/landowners within the context of his or her property.

STEP 4 - Factors:

Select and clearly document the reasons for the choice of factors. The LE component of the LEAR system must be based on the CLI capability ratings / speciality crop suitability ratings of the soils within the Evaluation Unit. Other physical factors that are important to agriculture within the study area may also be identified and incorporated into the LE component (e.g. microclimate). Additional information is provided in Tables 1 and 2.

STEP 5 - Data Collection:

Collect appropriate data. The information should include the most recent **Soil Capability Classification for Agriculture** maps. Such maps provide soil capability class ratings of 1 to 7 for common field crops and are based on the

Canada Land Inventory Capability Classification System. Maps at a scale of 1:50 000, or of greater detail, should be obtained.

Where speciality crop suitability ratings are available, they should be obtained as well. As new soil capability / suitability information becomes available (e.g. upgraded soil survey which provides soil capability ratings), it should be integrated into the LE evaluation as soon as possible.

Step 6 - Weighting the Factors:

After approving the selected LE factors, the local committee should assign relative importance (weight) to each factor. In most studies, it will be the Provincial LE factors that will be weighted the highest against all other LE factors (refer to Tables 1 and 2).

The most important factor should be assigned the highest weight. Other factors should be assigned weights depending on their relative importance in terms of all of the factors selected. In those situations where soils information is being used as the sole LE Factor, a weighting of 1.0 should apply. Where other LE Factors are included, the total LE weighting should again not exceed 1.0 (e.g. soils = 0.8 / microclimate = 0.2)

It is important to concurrently establish the LE weightings and the AR weightings in order to recognize the scoring relationship between the two LEAR components (see also Step 5 - AR factors).

Step 7 - Scoring:

The collected LE data is reviewed for each Evaluation Unit and scores are calculated as per the assigned points and weights (refer to Table 1).

- **Common Field Crops :**

Common Field Crop (FC) scores for each Evaluation Unit are established by:

1. calculating the area of each soil capability class and expressing it as a percentage of the area within the Evaluation Unit (EU)

2. multiplying the above percentage of each soil capability class within the EU by the appropriate FC point value

3. a single LE score for each Evaluation Unit is determined by multiplying the calculated total field crop (TFC) points by the factor's weight.

4. once all of the Evaluation Units have been scored, the information is best mapped to provide a visual representation of the agricultural soils in the Study Area.

- **Speciality Crops:**

For some areas there may be suitability ratings for different speciality crops. In order to streamline the evaluation, it is advised that only the two predominant speciality crops within the study area may be used as the basis for the speciality crop suitability rating.

Speciality Crop (SC) scores for each Evaluation Unit are established by:

1. calculating the area of each soil suitability rating and expressing it as a percentage of the area within the Evaluation Unit (EU)

2. multiplying the above percentage of each soil suitability rating within the EU by the appropriate SC point value

4. a single LE score for each Evaluation Unit is determined by multiplying the calculated total speciality crop (TSC) points by the factor's weight

Once all of the Evaluation Units have been scored, the information is best mapped to provide a visual representation of the agricultural soils in the Study Area.

***** Areas with both Common Field Crops and Speciality Crops *****

For those Evaluation Units where **both** the soil capability **and** soil suitability for speciality crop ratings have been reviewed, the resulting FC and SC scores will need to be compared to determine which score represents the highest agricultural potential (i.e. either the FC or the SC). The score with the highest potential will be the basis for the single LE score for each Evaluation Unit. As such, this FC **or** SC score will be multiplied by the factor's weight to generate the single LE score for the Evaluation Unit.

TABLE 1:

Determining the LE Score based on soil capability ratings (CLI)

Eval. Unit (EU) # ___	Soil Capability Class	# of Hectares (ha)	% of Eval. Unit	Field Crop Points [1] (FCP)	FC Score (FCP x % of EU)	LE Score (TFC x Weight) [2]
	1			1.00		
	2			0.80		
	3			0.65		
	4			0.55		
	5			0.50		
	6			0.40		
	7			0.00		
Total		Total Hectares	100%		TFC score	LE Score

[1] Field Crop Points for CLI Classes 1 to 6 represent the minimum assigned point values for each individual soil class. For the purposes of the LE component, an FC Point value of 0.00 was assigned to Class 7 soils and organic soils (where no capability rating is available).

[2] In those situations where soils information is being used as the sole LE Factor, a weighting of 1.0 should apply. Where other LE Factors are included, the total LE weighting should again not exceed 1.0 (i.e. soils = 0.8 / microclimate = 0.2)

TABLE 2:

Determining the LE Score based on soil suitability ratings for speciality crops

Eval. Unit (EU) #1	Speciality Crop Rating [1]	# of Hectares	% of Eval. Unit	Speciality Crop Points (SCP) [2]	SC Score (SCP x % of EU)	LE Score (TSC x Weight) [3]
	Good			1.00		
	Fair-Good			0.80		
	Fair			0.60		
	Poor-Fair			0.40		
	Poor			0.20		
	Very Poor			0.00		
	Unsuitable			0.00		
Total		Total Hectares	100%		TSC score	LE Score

[1] Soil suitability ratings for speciality crops are provided in upgraded soil surveys. In some surveys they are given as S1, S2, S3....etc. Separate speciality crop indices for those ratings must be determined. Also, the suitability rating which would result after improvement (irrigation and/or tile drainage) should be used.

[2] Based on expected productivity and agricultural use, speciality crop point values will vary depending on additional research on commodities in the study area. In most situations however, the Provincial point values represent the minimum assigned points for each individual SC rating.

[3] In those situations where soils information is being used as the sole LE Factor, a weighting of 1.0 should apply.

Please refer to Appendix 2 for Land Evaluation (LE) examples

AREA REVIEW (AR) COMPONENT

Introduction:

This section of the Guide outlines the various steps involved in developing the AR component of the LEAR system.

AR is not mathematically precise. The factors and weights used are general guidelines that could be modified to suit the unique set of land use values that apply in each community. The key to the Area Review component is the consistent application of the factors across the study area.

The AR should meet the following objectives:

- determine those non-physical factors that affect long-term agricultural production;
  and;
- be consistently applicable within a study area.

The following **steps** should be taken to derive the AR component score for each Evaluation Unit.

STEP 1 - Establish Purpose of AR:

Determine and document the purpose of the AR. The local committee should clearly define its goals and objectives at the outset. These goals and objectives should have regard for the Provincial goal of identifying and protecting prime agricultural areas as part of the municipal land use planning process.

STEP 2 - Define Study Area and Evaluation Units:

The Study Area and Evaluation Units will be the same as those established under the LE section Steps 2 and 5. In addition, the study area for AR component should consider a 'margin' (e.g. 1 kilometre) around the perimeter of the Study Area boundary in order to allow for the complete calculation of the Surrounding Agriculture factor (see Surrounding Lands in Glossary section).

STEP 3 - Factors:

Select and clearly document the reasons for the choice of factors. AR factors included in the LEAR system should be those determined to be important

in making decisions about protecting agricultural land. The Provincial objective of identifying prime agricultural areas must be adequately reflected in the factors selected. As such, the Area Review may choose to reflect certain provincial factors (APPENDIX 2 – Table 3) that form the basis for AR evaluation.

In addition to the provincial AR factors, the local committee is encouraged to review regional conditions to determine if there are any other factors that should be incorporated into the AR system. All AR factors should be measurable with a clear definition and/or procedure.

STEP 4 - Data Collection:

Assemble available information that will reflect the objectives of the AR

Assessment maps showing the land parcel sizes and configurations, official plan and zoning schedules, and any other maps showing existing uses and approved developments are to be collected and/or prepared. Any maps showing existing agricultural information, such as cropping patterns (i.e. Agricultural Resource Inventory Mapping) or livestock operations are also useful. It is important that the maps showing parcels and uses are current.

STEP 5 - Weighting the Factors:

After approving the selected AR factors, the local committee or municipality should consider the relative importance (weight) of each factor. Weights can be considered for each factor selected. The most important factor should be assigned the highest weight. Other factors should be assigned weights depending on their relative importance in terms of all of the factors selected.

In most studies, it will be the provincial AR factors that will be weighted the highest amongst all AR factors (refer to Table 3).

As indicated in LE - Step 6, the weightings for the LE and AR factors should be established concurrently.

STEP 6 - Scoring:

Each selected AR factor must be arranged in an appropriate scale that should be uniform and linked to supporting data. Scoring is based on the likelihood for continued agriculture, with the highest score assigned to the best case situation for agriculture.

The collected data is reviewed for each Evaluation Unit and scores are assigned AR factors; points; and weights (refer to Table 4). The local committee must document the conditions under which scores are assigned. Documentation should be detailed enough to permit users to clearly understand the reason for assigning a given number of points to a given set of conditions.

A single AR score for each Evaluation Unit is determined by multiplying the calculated points by the factor's weight.

PROVINCIAL AREA REVIEW (AR) FACTORS

TABLE 3:

	Scales	Points	Weight [1]
• **Percentage of Evaluation Unit in agricultural use:** A high degree of agricultural use within the Evaluation Unit provides an indication of the unit's ability to sustain farm operations. This factor decreases in value as the amount of land in agricultural uses decreases. Calculate the % of the evaluation unit in agricultural land use and find associated points; multiply by applicable weight to determine AR score.	85-100% 70-84% 55-69% 40-54% 25-39% 10-24% 0-9%	1.0 0.9 0.75 0.6 0.4 0.2 0.1	X
• **Percentage of Surrounding Lands in agricultural use:** If all of the land surrounding the Evaluation Unit is in agricultural use, the area is more valuable for agriculture than if the surrounding lands are urban/non-farm. The area to be considered as "surrounding" must be justified and documented; however, in most cases this area should include at least a 1-kilometre buffer around all Evaluation Units. Calculate the % of agriculture in surrounding lands and find associated points; multiply by applicable weight to determine AR score.	85-100% 70-84% 55-69% 40-54% 25-39% 10-24% 0-9%	1.0 0.9 0.75 0.6 0.4 0.2 0.1	X
• **Parcel Size:** A low degree of fragmentation is representative of larger farm parcel sizes which assist in maintaining the flexibility to accommodate a range of agricultural activities and ensure long-term viability. Conversely, an area that is severely fragmented is less attractive for long-term agriculture. This factor increases in value as size of the parcel increases. Calculate the size of the evaluation unit and find associated points; multiply by applicable weight to determine AR score.	>36.4 ha 20.2-36.4 10.1-20.1 4.5-10.1 <4.5 ha	1.0 0.8 0.6 0.4 0.1	X

et up a scoring scheme — with a graduated scheme: Agriculture gets the highest score Idle land or Natural features get 2nd highest. Urban/ residential gets lowest.

Additional factors, which reflect the objectives of the study, may be developed locally.

[1] In all circumstances, the total AR weighting should be 1.0 (i.e. agriculture % = 0.5 / surrounding agriculture % = 0.2 / parcel size = 0.3).

TABLE 4:

AREA REVIEW (AR) SCORING

Evaluation Unit # ____

FACTORS	% in Agriculture (Table 3)	Parcel Size (ha) (Table 3)	Other	Points (Table 3)	Weights (Table 3)	AR Score: (Point x Weight x 100)
% of E.U. in agriculture						
% of surrounding lands in agriculture						
Parcel Size						
Other						
TOTAL						Total AR Score

NOTE: Please refer to APPENDIX 1 - GLOSSARY for a specific explanation of each Provincial Factor and other associated terminology. Any other factors (e.g. degree of farm capital investment/support services, ownership patterns) to used should be explained and defined in a similar manner.

Please refer to Appendix 2 for Area Review (AR) examples

DETERMINING OVERALL LEAR SCORES

LE: AR Ratio

The local committee guiding the development of the LEAR system for the municipality must consider the relative importance of Land Evaluation and Area Review in terms of total score to determine the desired ratio between them. This ratio represents the optimum balance between Land Evaluation (LE) and Area Review (AR) factors to achieve Provincial policy objectives.

The LE: AR ratio proposed by this model is 1:1. As such, if the LE maximum total score is 100, only a maximum total score of 100 may be set for AR thereby creating a maximum total score of 200.

Should a municipality desire to strengthen the importance of the LE component (e.g. a ratio of 2:1 or 3:1), such a modification must be justified and documented as part of study. Under no circumstances, however, should the AR component be weighted greater than the LE component. In all situations, the final ratio should be field tested and results documented to ensure that results meet the intended objectives.

Evaluation Unit Scoring:

With the factor weightings and LE:AR ratio being set, the total score for each EU is obtained by adding LE and AR scores together. Once this process is completed for each Evaluation Unit within the defined study area, all EU's will have a total LEAR score.

Setting Thresholds for Decision-Making:

Upon completion of the scoring for all Evaluation Units, thresholds have to be established for decision-making. These thresholds are set so as to indicate which lands warrant long-term protection for agricultural use. OMAF should be contacted during the setting of the thresholds to provide assistance with the development of an appropriate threshold function.

There are two primary methods that can be employed to highlight prime agricultural areas. Setting the LEAR thresholds for decision-making can be done by:

(1) allowing a single threshold score to control the decision; **or**

(2) by providing for some level of factor compensation.

- *(1) Single Threshold*

The simplest manner in which to select a threshold is to identify a **single threshold score.** Above this LEAR score, Evaluation Units would be recognized as prime agricultural lands, below this score, Units will not be considered as prime agricultural land.

One manner through which the threshold score could be set is a statistical analysis of the LEAR scores (e.g. mean; median; and/or mode scores). Another method may involve the local committee in the determination of the single threshold by relating the actual field conditions of the Study Area to the LEAR scores for selected Evaluation Units. Through this 'ground- truthing' of the LEAR scores, committee consensus can be established.

- *(2) Compensating Factors*

The focus of the single threshold approach is on the overall score , irrespective of the factor scores that make-up the threshold score. As such, it would not matter that one or more of the factors may have very low scores, as long as other Factors have high enough scores to compensate.

However, there may be many combinations of factor scores that could potentially arrive at the same total LEAR score. To recognize the interactions among factors, the following alternative method could be utilized. This method involves **Compensating Factors**, whereby some minimum level of individual factor(s) score must be present. For example, an approach would be to ensure that all Provincial Factors within an Evaluation Unit (EU) must meet a minimum score level in order to be categorized as either prime agricultural land or non-agricultural lands.

A caution with this approach is that one of the identified factors may in fact control decision-making overriding other factors or the total score. In order to alleviate this concern, one may choose to only set a minimum score level for certain critical factors (e.g. soil capability ; parcel size) and the total LEAR score. This process would allow for high scores in some factors to compensate for low scores in other factors. This is achieved by permitting the scores of non-critical factors to vary depending on how high or low the scores for the critical factors are. OMAF staff can assist in the design of these thresholds for compensating Factors. Examples of this approach are outlined in Appendix 2.

The determination of the threshold criteria (e.g. minimum score level) and the ranges should be carried out by the local committee. Its agricultural knowledge will be instrumental in reviewing the scores, comparing the actual versus score conditions (reality check) and reaching a consensus as to appropriate threshold criteria for the Study Area.

Determining Prime Agricultural Areas:

Once the threshold scores have been established and applied, the LEAR system has been completed. At this time, decision-makers must undertake to designate the prime agricultural areas with the intent being to protect large, contiguous areas for agriculture. As a general rule, prime agricultural areas should be 250 hectares or larger. There may be areas of the Province where these prime agricultural areas will be smaller or larger. Such a determination should be based on the type of agricultural activities in the area (i.e. speciality crop areas). In addition, regional and locally significant areas may be smaller. Areas of poor lands which scored below the LEAR threshold should also be 250 hectares or larger before being identified as a separate non-agricultural designation.

While the LEAR System will have produced scores for each Evaluation Unit within the Study Area, it is important to understand the composition of that score (i.e. a low score may largely be the result of a small percentage of surrounding agricultural land use or high percentage of organic soils). In many situations, these scores will reflect the presence of an environmental feature (i.e. wetland, forests, etc.) and, while having the effect of lowering the LEAR score, would be considered as compatible with agricultural activities. As such, municipalities should overlay the LEAR mapping with these environmental features to ensure that contiguous agricultural areas are recognized.

In identifying agricultural areas, it should be noted that such areas often cross municipal boundaries. Areas that are part of a larger inter-municipal agricultural area should be designated. In many cases, the boundaries of the agriculture designation itself will reflect the physical characteristics of the study area. Identifiable boundaries (i.e. natural features, roads) should be used to create the designation.

OMAF Input:

In order to maintain a consistent approach to the identification of prime agricultural areas among local LEAR systems, the OMAF has provided for a series of 'checkpoints'. As indicated in LEAR Activity Flowchart (APPENDIX 3), it is important to involve OMAF from the early stages of the LEAR system through to the completion of the system. In all situations, OMAF advice should be sought in the selection and definition of the LE and AR factors, their weights, the threshold scoring and at the conclusion of the LEAR model.

APPENDIX 1 - GLOSSARY

Terms and Definitions:

Agricultural Resource Inventory (ARI)
The ARI is comprised of two components: (1) agricultural land use maps; (2) tile drainage maps.

The basis for the land use maps is the characterization of an area as part of either an agricultural land use system (i.e. monoculture, mixed) or non-agricultural land use (i.e. idle, built-up, extraction). The aim of the ARI land use maps (1:50 000) is to identify predominate cropping patterns over time. Only current information should be utilized.

The drainage maps are a compilation, by municipality, of the type (i.e. random, systematic), location and extent of known on-farm and municipal drainage systems. Updated drainage information is added to the map inventory as the data becomes available.

Agricultural Use
Uses that include all forms of primary agricultural uses; secondary agricultural uses, and agriculturally related uses. Specific components of the above-noted uses are detailed in Provincial Policy Statement.

In defining the lands that are associated with agriculture, the following aspects should be included: tillable lands, pasture, drainage ditches and woodlots (less than 2.5 hectares) and farm residences, livestock facilities and associated buildings (whether or not in current use). Additional lands that are lying idle or in rough pasture should also be included as they have food producing capability although not currently used.

Evaluation Unit
An Evaluation Unit (EU) is the individual land area that will serve as the basis for data collection and the analysis of soil capability ratings . The Evaluation Unit must be of an appropriate scale for the Study Area and level of data available. The most detailed unit of land management is based on property ownership and is recommended as the EU in most circumstances.

Guidelines for Application of Canada Land Inventory Agricultural Capability Classification in Ontario
The Canada Land Inventory for agriculture is an interpretative system for assessing the effects of climate and soil characteristics on the limitations of land for growing common field crops. Common field crops in Ontario include corn, soybeans, small grains, and perennial forages. These Guidelines seek to provide guidance regarding the current interpretation and application of CLI soil classification system within the Province of Ontario.

Productivity Index
The comparative relationship between the land's soil class and its yields for common field crops assuming the same level of management. Refer to ARDA Report No. 4, The Assessment of Soil Productivity for Agriculture for details.

Provincial Policy Statement (PPS)
Issued under Section 3 of the Planning Act, effective as of May 22, 1996 and amended from time to time, the PPS covers a broad range of policy areas affecting matters of provincial interest including agricultural land use.

Soil Capability Classification for Agriculture (Canada Land Inventory)
An interpretative classification that groups mineral soils with similar limitations or similar productivities into seven classes. Classes 1 to 3 soils are considered to be suitable for sustained productions of common field crops, hay and pasture. Class 4 soils are marginal for sustained production of common field crops but capable of use for hay and pasture. Class 5 soils are capable for use only for permanent pasture and hay, whereas Class 6 soils can be used only for wild pasture. Class 7 soils have no capability for agriculture.

In utilizing the classification system, several assumptions have been made. For additional details, refer to **Soil Capability Classification for Agriculture, Report No. 2**, ARDA 1965.

Soil Complexes
Due to soil mapping scale, a combination of landscapes or land areas often has to be included in one map delineation. Such combinations are portrayed on the soil maps as 'soil complexes' and consist of a dominant and subdominant (or significant) component. In much of the CLI soil mapping, these complexes have been defined in terms of the percentages of both the dominant and subdominant components (e.g. Class 2(60%)/Class 4(40%)). In determining the LE Score, use these complex percentages to calculate the number of acres and percentage of evaluation unit.

In those areas where soil mapping does not define the percentages of the dominant/subdominant components, it should be assumed that the dominant component represents 70% and the subdominant 30% of the total soil complex. These percentages would then be used in the calculation of the LE Score in the same manner as described above.

Speciality Crop Suitability Ratings
In those areas of the Province where soil suitability for speciality crops has been determined, there are a number of rating systems which are County or Region-specific (i.e. Niagara, Elgin). The LE component for Speciality Crops as outlined in Table 2 is reflective of one such rating system. Where a different rating system is in place for an area or municipality, the local speciality crop ratings should be

used and the Speciality Crop Index (SCI) modified to represent the local conditions.

Study Area
In applying the LEAR system, the Study Area within which the agricultural review will be undertaken must be clearly defined. In many situations, this Area may simply be the subject municipality. However, where farmlands are limited to only specific areas within a municipality, the LEAR can be prepared for that agricultural portion of the jurisdiction. By focusing the LEAR system in this manner, the efficient municipal resources can be maximized.

In all situations, only those lands available for agriculture should be included within the Study Area for the purposes of calculating Evaluation Unit scores. Those lands that have been committed for non-farm uses within an approved Official Plan or Zoning Bylaw and which consist of a substantial size should be excluded (e.g. urban areas).

Smaller sites that may have been committed to non-farm uses but are located within a larger agricultural area should be included within the LEAR Study Area. In addition, physical features such as wetlands, watercourses (e.g. lakes and rivers), forests should be included.

Surrounding Lands
A margin of lands surrounding the individual Evaluation Unit that is being reviewed. In most situations, this margin will be a 1 kilometre or greater buffer from the property boundaries of each separate property. Surrounding lands will be located in neighbouring municipalities and need to be included in order to properly calculate the degree of agricultural activity in a broader area.

Factors

Percentage of Evaluation Unit in Agricultural Use:

This factor highlights the current degree of agricultural use within the evaluation unit and provides a limited indication of non-farm uses that may affect long-term agricultural activity.

For AR purposes, there may be several information sources that could be utilized to determine the percentage in agricultural use. A primary data source could entail local field inspections, landowner questionnaires and remotely sensed data at a detailed scale. In those Study Areas with current Agricultural Resource Inventory mapping (agricultural land use), this information could supplement the primary data and provide consistent interpretation as to the nature of the lands use (i.e. agricultural or non-agricultural land use system). In addition, municipal

Official Plans should be reviewed to determine the location of lands already committed to non-agricultural uses.

Percentage of Surrounding Lands in Agricultural Use:

This factor is a major indicator of the agricultural character within the study area. The degree of agricultural use surrounding an Evaluation Unit will greatly influence the long-term potential of the evaluation unit for agriculture. An Evaluation Unit that is isolated from larger, contiguous farm areas, is more likely to be subjected to non-farm encroachment. The inherent conflicts that may arise between farm and non-farm uses may be further compounded by the farm's inability to expand its facilities or land base.
Long-term agriculture requires a certain critical mass upon which farming can expand and prosper. This critical mass would include supportive farm infrastructure (roads, fences, drainage, agri-business services, etc.) and an adequate farmland base for business expansion and neighbouring agricultural activity.

Information sources and procedure will be the same as those outlined for the 'percentage of the Evaluation Unit in agricultural use'.

Parcel Size:

This factor indicates the size of each Evaluation Unit. In most circumstances, smaller parcel sizes have a decreased capability, flexibility, suitability and viability to take advantage of the changing opportunities in the agricultural industry over time. Consequently, an Evaluation Unit that is severely fragmented may have limited long-term potential for continued agricultural use, tend to escalate land prices beyond farm levels and attract non-farm development. Notwithstanding, it is important for the local committee to have an appreciation of the average farm parcel size for the Study Area in order to determine the appropriate scale and points' for the factor (see AR Table 3). In areas where a smaller farm parcel size may be appropriate for the farm operations in the Study Area (e.g. speciality crop areas), the fragmentation factor's scale and points may be altered to reflect the local situation.

Other Factors:

Other Factors that may be considered may include agricultural infrastructure (i.e. drainage, buildings), proximity to non-farm uses, proximity to farm services, etc.

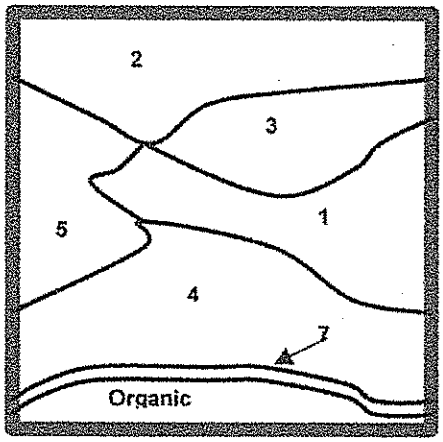
APPENDIX 2 – EXAMPLES: LE / AR / COMPENSATING THRESHOLD

PROVINCIAL LAND EVALUATION (LE) FACTORS

? CLI Soil Capability for Agriculture of lands within Evaluation Unit:

Soil capability classification and its associated productivity is a key indicator of potential agricultural production. The better the soils' capability for agriculture, the greater the productivity and range of agricultural activities that can occur. Soil capability ratings are assigned to not only those lands which are currently in production but those lands that are idle, used as pasture or are in scrub / bush. In this way, future production capability is safeguarded. This factor's score increases within the greater percentage of high capability soils in the EU.

CLI Soil Capability for Agriculture Classification



Example:

Table 1: Determining the LE Score based on soil capability ratings (CLI) with a weighting of 1.0

Evaluation Unit (EU) #1	Soil Capability Class	# of Hectares	% of Evaluation Unit	Field Crop Points [1] (FCP)	FC Score (FCP x % of EU)	LE Score (FC Score x Weight)
	1	7	22	1.00	22.0	
	2	8	26	0.80	20.8	
	3	4	13	0.65	8.4	
	4	9	29	0.55	16.0	
	5	1.7	5	0.50	2.5	
	6	0	0	0.40	0.0	
	7 & organic	1.7	5	0.00	0.0	
Total		31.4	100%		69.7	69.7

For this example the individual property's final weighted Land Evaluation score is 69.7 out of a possible 100.

[1] Field Crop Points for CLI Classes 1 to 6 represent the minimum assigned point values for each individual soil class. For the purposes of the LE component, an FC Point values of 0.00 was assigned to Class 7 soils and organic soils (where no capability rating is available).

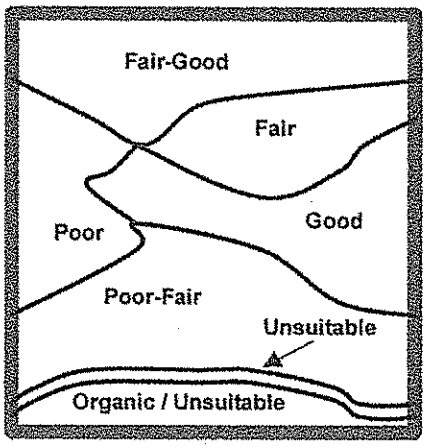
[2] In those situations where soils information is being used as the sole LE Factor, a weighting of 1.0 should apply. Where other LE Factors are included, the total LE weighting should again not exceed 1.0 (i.e. soils = 0.8 / microclimate = 0.2).

PROVINCIAL LAND EVALUATION (LE) FACTORS

- Soil Suitability for Speciality Crops within the Evaluation Units:

In many areas of the Province, speciality crop production represents an important agricultural activity. Given the unique characteristics necessary to allow for production (suitable soils and/or special climatic conditions), these lands are limited in amount and should be given the highest priority in the protection of the agricultural land base. This factor's score increases within the greater percentage of soils suitable for speciality high crops in the EU.

Soil Suitability for Speciality Crops



Example:

Table 2: Determining the LE Score based on soil suitability ratings for speciality crops (SC) with a weighting of 1.

Evaluation Unit (EU) #1	Speciality Crop Rating [1]	# of Hectares	% of Evaluation Unit	Speciality Crop Points (SCP) [2]	SC Score (SCP x % of EU)	LE Score (SC score x Weight)
	Good	3	15	1.00	15.0	
	Fair-Good	4	21	0.80	16.8	
	Fair	2	11	0.60	6.6	
	Poor-Fair	6	31	0.40	12.4	
	Poor	2	11	0.20	2.2	
	Very Poor	0	0	0.00	0.0	
	Unsuitable	2	11	0.00	0.0	
Total		19	100%		53.0	53.0

For this example the individual property's final weighted Land Evaluation score is 53.0 out of a possible 100.

[1] Soil suitability ratings for speciality crops are provided in upgraded soil surveys. In some surveys they are given as S1, S2, S3....etc. Separate speciality crop indices for those ratings must be determined. Also, the suitability rating which would result after improvement (irrigation and/or tile drainage) should be used.

[2] Based on expected productivity and agricultural use, speciality crop point values will vary depending on additional research on commodities in the study area. In most situations however, the Provincial point values represent the minimum assigned points for each individual SC rating.

[3] In those situations where soils information is being used as the sole LE Factor, a weighting of 1.0 should apply.

PROVINCIAL AREA REVIEW (AR) FACTORS

Example:

Table 3: Determining the AR Scoring based on a total weighting of 1.0 for AR

Evaluation Unit # ____

FACTORS	% in agriculture (Table 3)	Parcel Size (ha) (Table 3)	Other	Points (Table 3)	Weights (Table 3)	AR Score: (Points x Weight x 100)
% of E.U. in agriculture	79			0.9	0.5	45.0
% of surrounding in agriculture	65			0.75	0.2	15.0
Parcel Size		31.4 ha		0.8	0.3	24.0
Other			———	———	———	———
TOTAL						85.0

For this example, the individual property's final weighted Area Review score is 85.0 out of a possible 100.

Additional factors that reflect the objectives of the study may be developed locally.

In all circumstances, the total AR weighting should equal 1.0 (e.g. agriculture % = 0.3 / surrounding agriculture % = 0.35 / fragmentation = 0.35).

COMPENSATING THRESHOLDS - Examples

Example 1:

In this example, it is intended that a single factor should be allowed to control the determination of a property as prime agricultural land. As such, a property would have to exceed a series of minimum thresholds including the total LEAR Score in order to qualify as prime agricultural lands.

Factor	Parcel A	Parcel B
LE		
• Soil capability	69.7	52.0
AR		
• % of surrounding lands in agricultural use	15.0	15.0
• parcel size	24.0	12.0
TOTAL LEAR Score	154.7	114.0

Threshold Criteria for : Prime Agricultural Lands

LE >=65 and % surrounding lands >=12 and parcel size >=18 and total LEAR >= 140

Parcel A = prime agricultural land / **Parcel B** = non-prime agricultural land

Example 2:

In this example, it is intended that parcel size alone should not determine whether the individual property is considered prime agricultural or not. Should the soil capability be sufficient for crop production and the conflict from surrounding uses minimal, parcels of any size may be deemed suitable for long-term agricultural production.

1. if parcel size is < 20.1 ha, then total LEAR score must be > 170
2. if parcel size is >= 20.1 ha, then if soils < 65, the total LEAR score must be > 150
3. if parcel size is >= 20.1 ha, and if soils >= 65, then total LEAR score must be 130

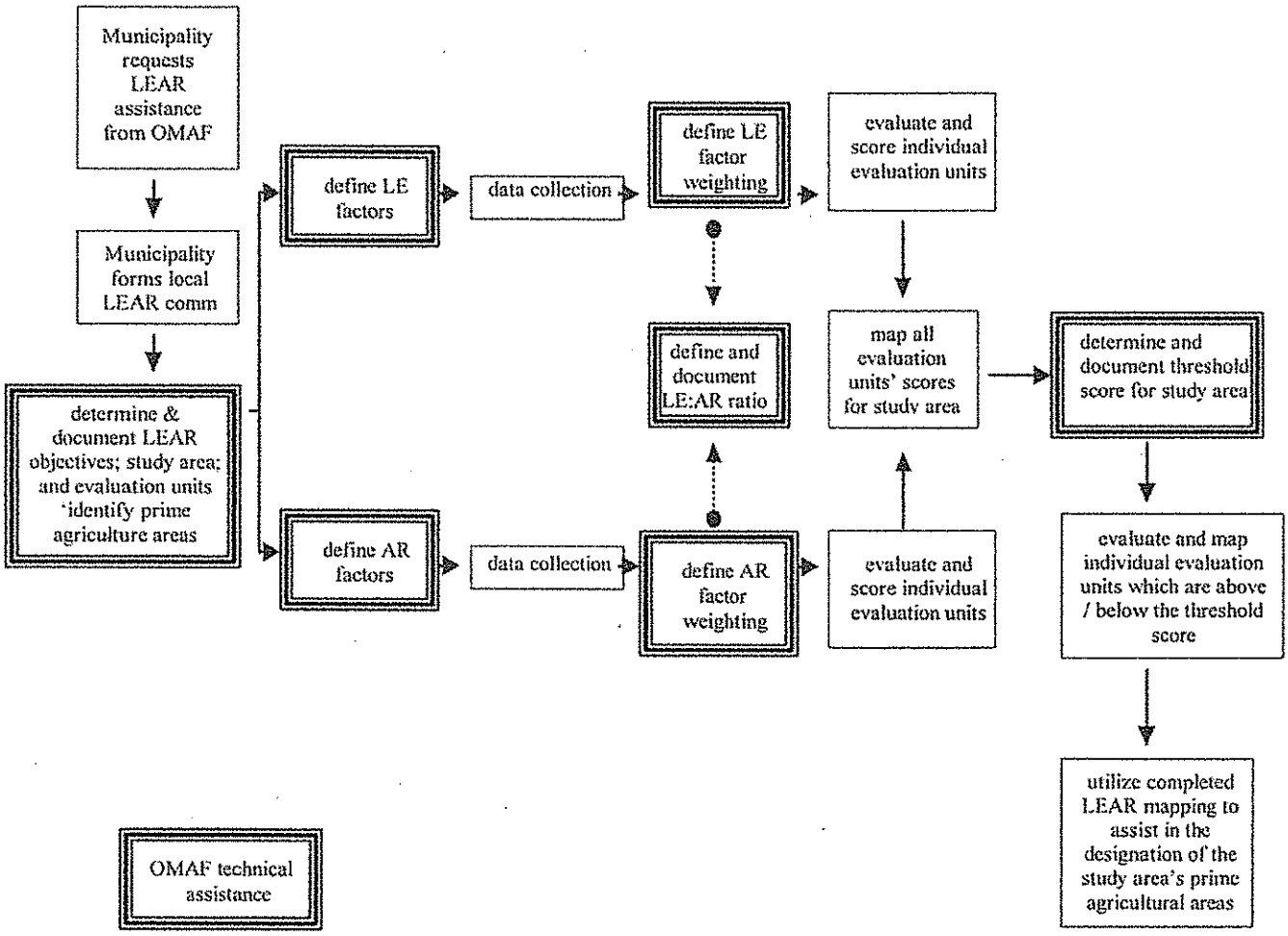
Example 3:

In this example, it is assumed that high capability soils can compensate for limitations stemming from adjacent non-agricultural uses and smaller parcel sizes and vice versa. As such, to qualify as prime agricultural lands, a property must have a minimum level of soil capability while other factors can vary. This approach would allow lower capability lands to be identified as prime agricultural lands only if they consist of large parcels and have no neighbouring conflicts.

LE Score >= 70 and total LEAR Score >= 140

NOTE:
The data used in the examples are for illustration purposes only. Each municipality should determine the content and methodology for the threshold process based on their own LEAR system.

LEAR Activity Flowchart



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