Appendix D

Portage County's Land Evaluation Site Assessment System (LESA)

Town of Lanark 2019 Comprehensive Plan

PORTAGE COUNTY'S LAND EVALUATION SITE ASSESSMENT SYSTEM

A tool to help assist local communities understand the agricultural landscape.

NOTE:
This tool is not designed to produce a "land use map." It is intended to provide information for the local plan commission about conditions on the landscape that may affect agriculture.

PORTAGE COUNTY'S
LAND EVALUATION SITE ASSESSMENT SYSTEM

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PORTAGE COUNTY'S
LAND EVALUATION SITE ASSESSMENT SYSTEM

1. INTRODUCTION

A. Defining the LESA System

The Land Evaluation and Site Assessment (LESA) system is a point-based approach that is generally used for rating the relative value of agricultural land resources. In basic terms, a given LESA model is created by defining and measuring two separate sets of factors. The first set, **Land Evaluation**, includes factors that measure the inherent soil-based qualities of land as they relate to agricultural suitability. The second set, **Site Assessment**, includes factors that are intended to measure social, economic, and geographic attributes that also contribute to the overall value of agricultural land. While this dual rating approach is common to all LESA models, the individual land evaluation and site assessment factors that are ultimately utilized and measured can vary considerably, and can be selected to meet the local or regional needs and conditions a LESA model is designed to address. The LESA methodology lends itself well to adaptation and customization in individual states and localities.

B. Background on LESA Nationwide

In 1981, the United States Department of Agriculture (USDA), Soil Conservation Service, now known as Natural Resource Conservation Service (NRCS) released a new system that was designed to provide objective ratings of the agricultural suitability of land compared to demand for nonagricultural uses of lands. The system became known as Land Evaluation and Site Assessment or LESA. Soon after it was designed, LESA was adopted as a procedural tool at the federal level for identifying and addressing the potential adverse effects of federal programs. (e.g., funding of highway construction) on farmland protection. The Farmland Protection Policy Act of 1981 (5) spells out requirements to ensure that federal programs, to the extent practical, are compatible with state, local, and private programs and policies to protect farmland, and calls for the use of LESA to aid in this analysis. Typically, NRCS staff is involved in performing LESA scoring analyses of individual projects that involve other agencies of the federal government.

Since the inception, the LESA approach has received substantial attention from state and local governments as well. Nationwide, over two hundred jurisdictions have developed local LESA methodologies. One of the attractive features of the LESA approach is that it is well suited to being modified to reflect local conditions. Typical local applications of LESA include assisting in decision-making concerning the siting of projects, changes in zoning, and spheres of influence determinations. LESA is also increasingly being utilized for farmland protection programs, such as the identification of priority areas to concentrate conservation easement acquisition efforts or purchase of development rights.

2. PORTAGE COUNTY APPROACH

A. Decision-Making Tool

Portage County is making an effort to preserve productive farmland and manage non-farm rural residential development. The Land Evaluation and Site Assessment (LESA) system is an analytical tool used to assist decision makers in comparing agricultural sites based on their agricultural value. The LESA system provides an objective and consistent tool to aid decision-makers in evaluating the relative importance of specific sites for continued agricultural use. In this sense, it is a tool for determining the best use of a site. While in some cases the best use may be some type of development, there are many other situations where the best use is to remain in agriculture. Also, there may be instances where the land is not suitable for agriculture, but neither is it a suitable location for development. In such situations the LESA system is a valuable tool for determining the use with the least detrimental impact to the environment, economy and aesthetics.

B. System Components

As noted earlier, there are two components to the LESA system; the **Land Evaluation** (LE) portion of the system, which is based on soils and their characteristics, and the **Site Assessment** (SA) portion of the system, which rates other attributes affecting a site's relative importance for agricultural use. The Land Evaluation portion is stable and unchanging because the soils do not change and the data relative to those soils takes a long time to accumulate. The Site Assessment is dynamic and changes on a continual basis because there are regular changes in development, property ownership, roadway improvements, sewer expansions, etc. happening throughout Portage County.

3. LAND EVALUATION FOR PORTAGE COUNTY

A Land Evaluation (LE) system was developed by the USDA in 1981 and is now widely used throughout the U.S. LE provides a systematic and objective way to evaluate and numerically rank soils for their relative value for a specific use.

A LE rating was developed for Portage County by the Portage County Planning and Zoning Department. **Higher numbers mean greater value for agriculture**. LE ratings reflect this productivity potential, as well as the economic and environmental costs of producing a crop. Possible LE ratings range from 0 to 100.

Many physical and chemical soil properties are considered in the LE rating, either directly or indirectly, including soil texture and rock fragments, slope, wetness and flooding, soil erodibility, climate, available water capacity, pH (alkalinity versus acidity), and permeability.

Three soil property indexes are combined to produce the LE rating. This produces a rating that reflects the most important soil considerations for agricultural use in Portage County. Each of these data elements is assigned a point score from 0 to 100:

A. Prime Farmland Class Index

This index rates the major physical and chemical soil properties affecting agricultural use. Please see Appendix A for the prime farmland criteria in Wisconsin.

Index	Score
0 - Not prime farmland	0
1 – Prime if drained	70
2 – Prime if irrigated	90
2 - Prime farmland	100

B. Land Capability Class - Natural Condition Index

This index rates all soils in their natural, unaltered condition for the risk of environmental damage (eg: soil erosion, off-site damage from sediment, nutrient, and pesticide runoff or leaching) and the degree of management concerns and limitations for agricultural use. Please see Appendix A for further information on Land Capability Classes.

Land Capability Class	Score
1	100
2	90
3	70
4	50
5*	0
6	20
7	10
8	5

*There is no Land Capability Class 5 soil in Portage County.

C. Productivity Index

This index rates the potential productivity of the soil for corn and alfalfa. A productivity index (PI) was calculated for all soil map units in Portage County. The productivity index rates the potential productivity of each map unit relative to all other soils in Portage County. The index is calculated from corn and alfalfa yield data, which can be found in Section II of the USDA Technical Guide for Portage County.

If no corn or alfalfa yields are commonly grown on a soil due to wetness, steepness of slope, stoniness, etc., the map unit receives a score of 0 for the missing yield and will be reflected in a lower overall PI score.

The Productivity Index at is set at 100 for the most productive soil map unit in Portage County. All other map units were then proportionately adjusted by dividing them by the most productive soil map unit's yield total, which is 99.2. Please see the sample calculation below. The lower PI scores represent proportionately lower productivity for corn and alfalfa.

- **PI calculation details**

  1) The total maximum (long-term average) yield for corn and alfalfa in Portage County is determined:

  Corn 95 bu/acre -- highest long-term average corn yield in Portage County
  Alfalfa 4.2 tons/acre --highest long-term average alfalfa yield in Portage Co.
  99.2 = 100 PI

  2) The map unit is assigned a PI using the formula:
  (Corn Yield + Alfalfa Yield) / 99.2 x 100 = PI

  Example: corn yield = 90 bu/ac alfalfa yield = 3.5 tons/ac

  90 + 3.5 = 93.5 / 99.2 = .94 x 100 = 94 **PI**

D. Weighting Factor

A weighting factor is then applied to each of the three data element scores to reflect their relative importance. The weighting factors were chosen for the following reasons.

- **Prime Farmland. (60%)** This is a broad soil index component, which has national soil classification significance. It does not reflect crop yields. Some non-prime soils have much higher yields than some prime soils, usually due to slope and/or irrigation.
- **Capability Class. (30%)** This index considers many soil properties and conditions. This index indirectly considers the economic and environmental costs of producing a crop. Equally important was that the capability class is a system that is familiar to many local units of government.
- **Productivity Index. (10%)** Both corn and alfalfa yields were considered as part of this index. This factor was given little weight in Portage County because a number of our sand soils that can be irrigated have great productivity for vegetable production.

E. Sample LE Calculation:

The Portage County LE rating is calculated using the formula:

LE = (prime score x 0.60) + (capability score x 0.30) + (productivity index x 0.10)

Soil Data Element	*Score*	*x*	*Weight*	=	*LE Rating*
Prime Farmland	100	x	0.60	=	60.0
Land Cap. Class	90	x	0.30	=	27.0
Prod. Index	82	x	0.10	=	+8.2
TOTAL LE rating for the map unit					95.2 = **95**

F. LE Assumptions and Decisions

The following assumptions or decisions will be made when finalizing calculations.

- It is assumed that most wet soils in Portage County are not cropped under natural conditions, they require drainage of some type.
- LE factors will be adjusted to consider conditions where wet soils are being cropped. Aerial photography will be used to identify the mapping unit as being cropped. For areas of wet soils that are cropped, yield data, capability class and prime farmland criteria shall be used from the USDA Technical Guide Section II. (Prime if drained). Site visits may be required to make drainage determinations.
- Fractions of numbers will be rounded to the nearest whole number with a fractional number of .5 being rounded up to the next highest whole number.

4. SITE ASSESSMENT FACTORS

Site assessment rates non-soil factors affecting a site's relative importance for agricultural use. Potential development sites in which a land use change is contemplated are evaluated against factors in three general categories, SA-1 through SA-3. Each rating factor is assigned a range of possible values according to relative attributes of a specific two (2) acre area. This process helps to provide a rational, sound basis for making land-use decisions. Specific site assessment factors were developed based on existing Land Use Plans, Ordinances, and other adopted policies.

SA-1 FACTORS

These factors measure non-soil site characteristics effect on the potential for agricultural productivity or farming practices. Site factors evaluated include:

A. Land Area in an Agricultural Use Within ¼ Mile of Site

This factor measures the agricultural viability of an area. The factor is scaled to increase the rating as the percentage of land in agricultural uses within the area increases. The following scale will be used to determine the value of this factor.

% of Area in Ag Use	Score
90-100	100
80-90	85
70-80	70
60-70	55
50-60	40
40-50	25
30-40	10
< 30	0

Intent:

In order to limit potential nuisance complaints and other forms of conflict, pre-existing adjacent land uses should be evaluated in all cases. This factor is also a major indicator of the agricultural character of an area.

Definitions

Agriculture: Beekeeping; commercial feedlots; dairying; egg production; floriculture; fish or fur farming; forest and game management; grazing; livestock raising; orchards; plant greenhouses and nurseries; poultry raising; raising of grain, grass, mint and seed crops; raising of fruits, nuts and berries; sod farming; placing land in federal programs in return for payments in kind; owning land, at least 35 acres of which is enrolled in the conservation reserve program under 16 USC 3831 to 3836; participating in the milk production termination program under 7 USC 1446 (d); and vegetable raising. (Source: Wis. Stats. Chapter 91.)

Ownership: Any individual, association, company, corporation, firm, organization or partnership, singular, plural, of any kind.

SA-2 FACTORS

These factors measure development or conversion pressures on a site. Site factors evaluated include:

A. Land Area Adjacent to the Site Proposed for Agricultural Use in the Community's Land Use Plan

This factor includes the community's perception or desire for future growth as designated on their Land Use – Site Assessment Map. The following scale will be used to determine the value of this factor.

Land Use Category	Score
Agr. - L-1	100
Agr. - L-2	80
Agr. - L-3	60
Natural Area-Limited	40
Resource Extract.	40
Industrial	20
Res. - Low Dens.	20
Res. - Med. Dens.	20
Commercial	20
Institutional	20
Natural Area - Protected	0

Intent:

This factor is important because the Land Use Plan adopted by the community and the County constitutes the County's policy regarding the preservation of prime farmlands for agricultural use and the identification of other areas for residential, commercial, industrial and other non-agricultural uses.

SA-3 FACTORS

A. Environmental and Public Values of the Site

This factor measures the public values of a site, such as environmental values. If any of the environmental factors are present on more than 50% of the sample area, that entire area will be scored as 0.

Env. Factor present	Score
water	0
wetland	0
floodplain	25
slopes > 6%	
highly perm. Soils - Rapid	25
woodlands > 10 acres	0
depth to gr. water < 5ft.	25
stream corridor	0

Sample SA Calculation:

The Portage County SA rating is calculated using the formula:

SA = (SA-1 x 0.30) + (SA-2 x 0.50) + (SA-3 x 0.20)

Site Assessment Factor	*Score*	*x*	*Weight*	=	*LE Rating*
Ag Use w/in ¼ mile	85	x	0.30	=	25.5
Land Use Map	80	x	0.50	=	40.0
Environmental Factor	50	x	0.20	=	+10.0
TOTAL SA rating for the map unit					75.5 = **76**

SA Assumptions and Decisions

The following assumptions or decisions will be made when finalizing calculations.

- It is assumed that a community's desired development and growth, as shown by its land use map, would rank as the highest non-soil factor.
- Fractions of numbers will be rounded to the nearest whole number with a fractional number of .5 being rounded up to the next highest whole number.

5. Threshold Values for LESA Scores

The combined Land Evaluation factors are worth 100 points as are the combined Site Assessment factors. The **LE** and **SA** scores are added to yield a potential final score for each two acre block ranging between 0 and 200 points, with a score of 200 representing lands that are of the highest value for agriculture (excluding specialty crops such as cranberries). Communities will then determine an appropriate threshold for ranking lands recommended for protection (i.e. areas with a score higher than 150 and greater than 40 contiguous acres). Weighting factors can be changed by each community to reflect its own priorities.

6. APPENDIX A

A. Prime Farmland Background Information

Soils, which meet ALL of the following criteria, are prime farmland in Wisconsin.

1) Not too dry (at least 4 inches of Available Water Capacity in the upper 40 inches)
2) Not too acid or alkaline (pH between 4.5 and 8.4 in the upper 40 inches)
3) Not too wet (not frequently flooded and water table generally deeper than one foot during the growing season)
4) No serious erosion problems (K factor x slope <2)
5) Permeability not restricted (at least 0.06 in/hr in the upper 20 inches)
6) Not too rocky (less than 10% rock fragments larger than 3 inches in the surface layer
7) Not too cold or too salty (generally don't apply in Wisconsin)

Notes:

- Crop yields are not a criterion. Some non-prime soils have much higher yields than some prime soils, usually due to slope.
- Present land use is not a criterion, except soils in urban use or water storage is not prime.
- Location is not a criterion. Only physical and chemical soil properties are considered.

B. Land Capability Class Background Information

Land capability classification is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. Capability class is the broadest category in the land capability classification system. Codes 1 - 8 (sometimes written as I - VIII) are used to represent both irrigated and non-irrigated land capability classes. Crop yield, present land use and location are not considered in assigning land capability classes.

Land capability classes place soils into groups with similar suitabilities and limitations for agricultural use. The risks of soil damage or limitations in use become progressively greater from class 1 to class 8 (sometimes written as I to VIII).

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or require special conservation practices.

Class 4 soils have very severe limitations that restrict the choice of plants or require very careful management, or both.

Class 5 soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food cover.

Class 6 soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.

Class 7 soils have very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife.

Class 8 soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or water supply or for esthetic purposes.