

# AGRICULTURAL, NATURAL AND CULTURAL RESOURCES ELEMENT

## Objective of Element

The basic purpose of this element is to provide background information on a wide variety of agricultural, natural and cultural resources and features in the Town (Exhibit G-1). This information will help the Town recognize and identify important resources that need to be protected and/or effectively managed. It will also identify if there is anything that may limit the development potential within the Town (e.g. poor soils, floodplains, wetlands, bedrock, ground water pollution, etc.). Collectively, this information will help the Town “Grow Smart” which is one of the major tenants of this plan and state statutes.

**Exhibit G-1. Basic Objectives of the Agricultural, Natural and Cultural Resources Element**

- Provide background information on a wide variety of agricultural, natural and cultural resources in and around the community.
- Provide maps that document the location and extent of these resources.
- Identify areas for development with the least impact on important resources and features.
- Identify physical limitations, if any, to development.

## Agricultural Resources

### General Overview

Agriculture in the state has long been a significant, but increasingly smaller segment of the statewide economy. In recent years, agriculture has accounted for just over 2 percent of the gross state product. Although agriculture is a relatively small economic sector, its imprint on the state’s landscape and cultural identity is significant. Statewide, dairy products account for over half of the cash receipts and field crops and livestock account for about 20 percent each. Specialty crops such as apples and cranberries account for 6 percent of the total. Federal farm policy continues to hurt many farmers in the state, making farming increasingly difficult.

Agriculture in Dodge County is currently in a long transition period as is much of the state. Between 1992 and 1997, the number of farms dropped nearly 10 percent to about 1,807 farm units. The number of households that rely on farming on a full-time basis has declined from 1,468 in 1992 to 1,189 in 1997, representing a drop of 19 percent.

The gross market value of agricultural products produced in Dodge County increased only 2.4 percent from 1992 to 1997, while the value per farm increased 13.5 percent. Over this 5-year period, the number of farm operations with milk cows has declined by 27.3

**Table G-1. Agriculture Characteristics; Dodge County: 1992 and 1997**

	1992	1997	Percent Change
<b>Land in farms (acres)</b>	414,240	391,959	-5.4
<b>Farms</b>	2,004	1,807	-9.8
<b>Full-time farms</b>	1,468	1,189	-19.0
<b>Part-time farms</b>	536	618	15.3
<b>Market value of agricultural products (1,000)</b>	\$189,231	\$193,585	2.4
<b>Market value of agricultural products per farm</b>	\$94,427	\$107,131	13.5
<b>Farms with milk cows</b>	949	690	-27.3
<b>Milk cows</b>	54,930	46,487	-15.4

Source: U.S. Census of Agriculture

percent and the total number of milk cows in the county decreased by 15.4 percent. This suggests that the number of farms has declined as well as the herd sizes.

The size of farms is changing, but in a way unlike what is seen in much of Wisconsin. Statewide, the number of mid-sized farms is decreasing as the numbers of small and large farms are both increasing. There are a growing number of hobby type farms as ex-urbanites move into more rural areas and as farm economics are forcing a relatively small proportion of full-time farmers to increase the size of their operations. Although we see smaller farms, the agglomeration of farm units into mega farms is more limited. However, in Dodge County (Table G-2.) from 1992 to 1997 the greatest percentage increase, 1.5 percent, was in farms averaging 500 acres or more. There was a 2.4 percent decrease in those farms in the 180-499 acre range. The slowest growth rate was for those farms in the 1-9 acre range.

**Table G-2. Size of Farms;  
Dodge County: 1992 and 1997**

Size (acres)	1992		1997	
	Number	Percent	Number	Percent
1 to 9	116	5.8	101	5.6
10 to 49	281	14.0	261	14.4
50 to 179	738	36.8	679	37.6
180 to 499	724	36.1	609	33.7
500 or more	145	7.2	157	8.7

Source: U.S. Census of Agriculture

Typical crops include: corn, soybeans, oats, hay and alfalfa which are the primary crops grown in the region. Specialty crops, vegetables and potatoes are also grown in the area.

## Natural Resources

### Geology

**Exhibit G-2. Sand and Gravel Potential of Selected Glacial Landforms**

Glacial Landform	Sand and Gravel Potential
Outwash (plains, terraces, fans and valley trains)	Likely source of commercial deposits. Generally found in flat-lying formations of varying quality and depth.
Ground Moraine	Low potential. Production is limited to other glacial landforms superimposed on the ground moraine, including gravel-cored drumlins and isolated kames, eskers and similar features.
End Moraine	Low potential. Isolated, small pockets may exist in association with outwash plains and ice contact deposits.

Source: Land Resources Analysis Program, 1976

The bedrock underlying the Town primarily consists of sandstone and limestone. Beneath these sedimentary rocks is the crystalline rock, which is impermeable to water. Rhyolite, granite and basalt are common components. The surface geology and landforms in the region (and much of Wisconsin) were formed by continental ice sheets that advanced and retreated from the region several times during the period of time known as the Pleistocene Epoch. Glaciated deposits are grouped into two categories depending on how the materials were moved. If moving water transported the materials, the resulting deposits are referred to as outwash deposits and are

characterized by well-sorted materials and stratified layers. If the ice sheets physically moved or carried the materials, the deposits are unsorted and unstratified and are known as till deposits. Although there are two main types of glacial deposits, they appear in a wide variety of landforms.

The town of Williamstown lies within the Eastern Ridges and Lowlands geographical province. Glacial landforms in the area include a number of cuestas and escarpments that form a belted plain. This plain will have parallel strips of uplands and lowlands. The uplands are called cuestas and the lowlands have been called vales. The cuestas are ridges that have a steep

escarpment on one side and a long gentle slope on the other. The Town is part of the Magnesian cuesta.

Perhaps one of the most unique and prominent geologic features in the Williamstown area is the Niagara Escarpment, locally known as “the Ledge”, which hugs the eastern edge of the Horicon Marsh and extends further south to the town of Iron Ridge and the Neda mines. Generally speaking, an escarpment is a steep ledge or bluff that separates two areas of differing elevation. The Niagara Escarpment is a layer of bedrock made up of limestone cliffs and talus slopes appearing like a giant saucer with the western edge in Wisconsin and the eastern edge in New York. The endurance of the Ledge is attributed to the erosion-resistant material that forms it. It is made of Silurian limestones and dolomites. Dolomite, the main ingredient, was formed by calcium and magnesium carbonate deposited from decomposing shells and skeletons of primitive sea life which lived in a subtropical coral reef over 400 million years ago. The escarpment was once the edge of a coral reef formed in the warm, clear, shallow salt waters at the edge of the giant Michigan basin. At the time, this ancient inland sea basin covered all of what are now Lower Michigan, Lake Michigan and eastern Wisconsin.

A layer of soft, impermeable layer called Maquoketa shale lies beneath the Ledge. It is in part because of this relatively soft shale layer that the Horicon Marsh was later formed by glacial action. It is also in part because of this impermeable shale bed that many crystal-clear springs form at the base of the Ledge. These springs were formed where glaciers deposited drift consisting in part of impermeable clays. Water flow continues on to eventually drain into the Horicon Marsh or Lake Winnebago.

Besides ancient marine life and the resulting up warping, glacial ice also molded the Ledge. In some places successive glaciers obliterated it, making it a difficult landscape feature to follow in southern Wisconsin. In other places, glaciers created huge fissures and crevasses. The Ledge would certainly be higher and sharper without the impacts of this glacial scouring and bulldozing.

As the Horicon Basin was being carved out of the land the advancing ice also created a series of elongated hills, called drumlins. The 2 large hills comprising Quick’s Point are drumlins. The islands located within the marsh are also drumlins. Dodge County and the surrounding area have the highest concentration of drumlins in the world.

Today the Ledge is known to harbor many rare species and important natural communities found in few places elsewhere in the world. This remarkable assemblage of plants and animals is of global importance. In addition, evidence of the oldest known humans living in Wisconsin has been found on the Oakfield Ledge: a projectile point over 11,200 years old. The Ledge near Horicon Marsh and continuing up to Fond du Lac is an apparent significant site for religious ceremonies, navigational landmarks, and astronomical observations for ancient Native Americans, still visited today. Sites along it contain petroglyphs, Native American rock art, and markings associated with the solstices and possibly the lunar cycle.

A United States Government land surveyor as part of the Wisconsin Territory Survey first mapped the Ledge as a prominent land feature in 1836.

### **Metallic and Non-Metallic Resources**

There are no known remaining metallic mineral deposits of economic value in or near the town of Williamstown. Mineral resources in Dodge County are nonmetallic in nature including sand, gravel, shale and limestone. The Niagara Escarpment is a source of commercial grade stone and is also the location of iron deposits, which were once mined in the area.

Sand and gravel resources are often referred to as “pits.” The term “quarry” is appropriate for limestone because such operations require controlled blasting to remove material. All mineral extraction operations are subject to state rules regarding dust control, blasting, safety and

reclamation. The most familiar uses for such nonmetallic mineral resources are road building and maintenance. The materials are also used in the construction of residential, commercial and public buildings, bridges, sewer and septic systems, and use in erosion control measures.

Although most of the commercial sources of sand and gravel are generally associated with the outwash deposits, isolated pockets of sand and gravel can be found as summarized in Exhibit G-2.

**Soils**

Soils in the region were formed from the Pleistocene deposits transported by continental glaciers that moved across the land many thousands of years ago. According to the Soil Survey of Dodge County produced by the Soil Conservation Service of the U.S. Department of Agriculture, the primary soils in the town of Williamstown are within two soil associations, Houghton-Pella, which is found primarily in the west, and Theresa-Lamartine-Hochheim, which is found in the east.

**Exhibit G-3. Soil Associations Found in the Town**

Soil Association	General Description
Houghton-Pella	Deep, nearly level, very poorly drained; poor potential for sanitary facilities and building site development.
Theresa-Lamartine-Hochheim	Deep, nearly level to steep, well drained and somewhat poorly drained soils that have a silty and loamy subsoil; good or fair potential for cultivated crops.

Source: Soil Conservation Service (1978)

The Houghton-Pella association is comprised of deep, nearly level, very poorly drained sub soils. In cultivated areas, the main management concern is drainage. The major soils have poor potential for sanitary facilities and building site development. The Theresa-Lamartine-Hochheim association contains deep, nearly level to steep, well-drained and somewhat poorly drained soils that have silty and loamy subsoil. Most of the soils in this association have good to fair potential for all the cultivated crops commonly grown in the county. In cultivated areas, the main concerns of management for Theresa and Hochheim soils are controlling erosion and maintaining good soil tilth. Theresa and Hochheim soils that have slopes of less than 6 percent have mainly good potential for sanitary facilities and building site development. Lamartine soils have poor potential for these uses.

In addition, according to the Dodge County Soil and Conservation Service, the area is comprised of five soil types. One of the soils (Mayville silt loam) is classified as prime farmland, and three of the soils (Pella silty clay loam, Lamartine silt loam, and Brookston silt loam) are classified as prime farmland where drained. These soils are drained. The remaining soil type (Theresa silt) is not prime farmland. In total, over 80 percent of the area could be classified as prime farmland.

**Groundwater**

Groundwater in Dodge County is contained in layers of porous bedrock in four geologically distinct aquifers. Water in an aquifer travels underground from its source to a discharge point such as a well, wetland, spring or lake. Groundwater moves through these aquifers in an artesian system and a water table system. In an artesian system the water moves because it is under pressure created by a confining layer of impervious rock. In a water table system the water is not under pressure and flows by gravity. The artesian system is present in the northeastern corner of Dodge County where the town of Williamstown is located. The lowest aquifer is composed primarily of sandstone and is the most productive aquifer. Aquifers closer to the surface tend to yield lesser amounts of water. Large undeveloped supplies of good quality groundwater for domestic, commercial and agricultural uses are available in Dodge County.

The Platteville-Galena aquifer provides water for the central two-thirds of Dodge County. Water from this aquifer is obtained from the water table system except where it is overlain by Maquoketa shale. This layer of impervious bedrock in the northeast and east central portion of the County effectively prevents water movement. Therefore, in the town of Williamstown that portion of the aquifer underlying the Maquoketa shale provides water through the artesian

system. Lateral movement of water from the west also recharges this portion of the aquifer. The groundwater level is continually changing due to well pumpage and recharge from precipitation. Because of continual pumpage from Milwaukee and Chicago, the water level in the artesian system is declining regionally.

The Department of Natural Resources maintains a database containing well information for many public and private wells in the State. A review of this database found that there are some wells with elevated levels of nitrates and volatile organic compounds. Nitrates can commonly enter



the groundwater from individual septic systems and from standard farming practices. Within the boundaries of the Town there are a number of designated atrazine prohibition areas as delineated by the Wisconsin Department of Agriculture. In the town of Williamstown this would include the southern half of section 36, all of sections 1 and 2, and the northern half of sections 11 and 12. Atrazine is a chemical used to grow corn and is often found in groundwater in the area and region.

Exhibit G-4. Major River Basins of Wisconsin



In 2000, the Drinking and Groundwater Section of the DNR ranked all of the watersheds in the state for groundwater contamination potential. The rankings are based on the amount of rural and urban land, the presence of confined feeding operations and sample analytical data for nitrate and pesticides from private wells. Based on the methodology selected, the scores could range from 0 (no potential) to 160. The East Branch Rock River watershed had a score of 71.18, which is considered moderately susceptible to contamination potential. The watershed is 66 percent agricultural. Of the 12 water samples taken, none exceeded the enforcement standard of 10 ppm for nitrates and one exceeded the preventative action limit of 2 ppm.

**Surface Water and Wetlands**

The Town is located primarily in the Upper Rock River Basin as shown in Exhibit G-4 between the Rock River and the East Branch of the Rock River within the East Branch Rock River watershed. The Rock River drains Dodge County toward the south, eventually emptying into the Mississippi River. The Rock River is generally oriented in a north-south direction near the town of Williamstown.

Most of the significant wetlands in the Town are associated with the Horicon Marsh, which dominates the western portion of the town of Williamstown. The majority of the marsh is classified as an emergent/wet meadow, narrow-leaved persistent, standing water, and palustrine wetland with evidence of muskrat activity. In the eastern portion of the town of Williamstown, the scattered wetlands are predominantly persistent emergent/wet meadows. These areas are not suitable for development and should be avoided.

## **Vegetation**

Pre-settlement natural vegetation in the area consisted primarily of oak savannas in the central part of the county, sugar maple, basswood, and elm in the eastern and southern parts of the county, white, black, and red oaks in the southeastern part of the county, and sedge meadows in the wetter northeast portion of the county near the town of Williamstown.

Since white settlement, fires have largely been controlled resulting in a change in vegetation and many of the prairies have been converted to agricultural uses. Many of the areas not used for agricultural purposes have developed into dense, closed forest ecosystems. On dryer hillsides, forests of white, red and black oak dominate, while mesic forests of sugar maple, basswood and elm are common on wetter sites.

## **Threatened and Endangered Species**

Based on information contained in Wisconsin's Natural Heritage Inventory there are 9 plant species and natural communities and 36 animal species in Dodge County that are threatened, endangered, or a species of special concern. Of these, six are known to exist in the Town. These include the great egret, black-crowned night heron, pug nose minnow, land snail, honey vertigo, and the southern dry mesic forest community.

## **Cultural Resources**

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### **Historical Overview**

Based on archaeological evidence so far discovered, the first inhabitants to what is now Wisconsin arrived over 10,000 years ago when the continental glaciers retreated northward. To help understand man's presence in the state, archeologists have defined general time periods as summarized in Exhibit G-5.

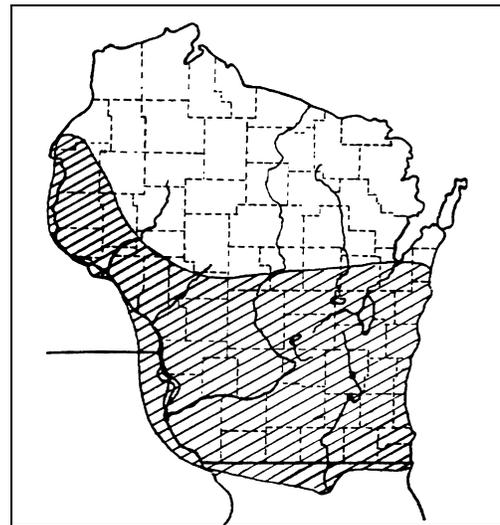
**Exhibit G-5. Archaeological Periods in Wisconsin**

Time Period	Name	General Description
10,000 years ago	Paleo-Indians	Paleo-Indian followed the woolly mammoth, mastodon and bison into the region as glaciers retreated.
8,000 years ago	Archaic	As the climate continued to warm, the large mammals of the Ice Age were replaced by many of the animals found in the state today. People lived in small family groups, harvested wild plants, nuts and acorns and hunted small animals such as deer and elk
3,000 years ago	Woodland Period	People tended to live in villages. The first evidence of agricultural activities, pottery and the use of bows and arrows. Many mounds were built often in the shape of shape of animals, including turtles, birds and bears, which are referred to as effigy mounds.
1,000 years ago	Mississippian Period	The people in this period know as Oneonta, lived in larger villages with extensive agricultural fields, often growing corn, beans and squash. The Oneonta were part of a complex trading network that extended to both coasts.
1634 to present	Historic Period	The arrival of Jean Nicolet, a French explorer, in 1634 marked the beginning of the Historic period.

Source: The State Historical Society of Wisconsin and others

Unfortunately, much of the evidence from the pre-history has been lost with increased urbanization and land alteration. Isolated prehistoric sites such as temporary or permanent settlements or extractive sites have been identified throughout the state. As noted in the above exhibit, people during the Woodland Period often built burial mounds. Although single mounds have been found, most occurred in groups, in some cases 30 or more in 1 location. The Town is located in an area of the state where Indian mounds are most common (Exhibit G-6). Numerous burial mounds are found in and around the area.

**Exhibit G-6. Distribution of Paleo-Indian Burial Mounds in Wisconsin**



**Archaeological Resources**

According to records maintained by the State Historical Society there are a significant number of archaeological sites that have been identified and catalogued in the town of Williamstown.

The entire twelve mile eastern border of the Horicon Marsh area contains many groups of prehistoric earthworks along the ancient and formerly heavily traveled trail. Approximately 300 mounds of all kinds have been surveyed and recorded along this route and a large number remain unrecorded. In virtually all of the various locations, the former sites of historic villages and composites yield evidence of the prehistoric occupation of the area by several different cultures. The evidences along the Horicon Marsh do not substantiate whom the original builders of the effigy mounds located there may have been, but all indications are that they supersede the occupancy of the area by the Winnebago Indians. Many of the major earthworks

found in the town of Williamstown have been recorded. A group of five Indian rock art paintings, most likely the first to be found in Wisconsin, were discovered in the extreme northeast corner of the NE quarter of Section 33, T12N, R16E, in the town of Williamstown. Also, within Dodge County successive Indian tribes inhabited the area, leaving behind their artifacts in testimony of their wanderings. The Menominee and Winnebago and perhaps the Potawatomi left evidence of their travels in the form of discernible trails.

### **Burial Sites**

In 1987, the state passed the Wisconsin Burial Sites Preservation law (s.157.70 Wis. Statutes) to protect historic and prehistoric burial sites from all types of human disturbance. The law gives the State Historical Society of Wisconsin the responsibility for inventorying and cataloguing all prehistoric and historic burial sites in Wisconsin. The law is to assure that all human burials in this state are granted equal treatment without reference to ethnic origins, religious affiliations, or age of the burial site. Once a burial site is registered, it is exempt from property taxes. Aside from exhumations authorized by coroners or by immediate family members, no one may disturb a human burial site without authorization from the Director of the State Historical Society of Wisconsin. The law also authorizes penalties for unauthorized disturbances or the failure to report disturbances.

According to the State Historical Society there are numerous effigy and mound burial sites in the Williamstown area. Those that have been recorded, to date, include:

- (1) Four effigy and one oval mound in the dense woods on the hill to the west of STH 28, which follows a diagonal course SW to NE, through the SW quarter of Section 28;
- (2) In the SW quarter of Section 28 there is a large village site and workshop area that extends into the NE quarter of the NW quarter of Section 33. In this area of Section 33 there is also a well rounded and gracefully made panther effigy in an excellent state of preservation as well as a large spring, surrounded by evidence of extensive campsites;
- (3) Six effigy mounds in the NE quarter of the SW quarter of Section 28;
- (4) Three effigy mounds in the NW quarter of the NE quarter of Section 28;
- (5) Two effigy and two oblong mounds in the E half of Section 13;
- (6) Group of five conical and other mounds on a ridge in the SW quarter of the NW quarter of Section 14;
- (7) Group of conical mounds in the NE quarter of Section 15;
- (8) Group of three effigy mounds in the SE quarter of the NW quarter of Section 26;
- (9) Group of four effigy mounds near the center of the NE quarter of Section 27;
- (10) Group of nine effigy and other mounds on the point of the ridge in the NW quarter of Section 27.
- (11) Burial mound in Section 33; and
- (12) Burial mounds and garden beds in Section 26, T12N, R16E.

In the town of Williamstown, Kekoskee Archeological District, there is also a pre-historic (0650-1300) domestic funerary, or village grave and burial site, identified on the Wisconsin National Register.

### **Historic Resources**

There are no historic sites in the Town that are listed on the National Register of Historic Places. However, according to the Architecture & History Inventory (AHI) maintained by the State Historical Society, there are 14 structures with historical significance in the Town. These include the following:

- (1) Stone House – Italianate, located on the south side of Elm Road .4 mile west of Dyke Road;
- (2) Stone gabled outbuildings located on the south side of Craig Road .4 mile east of CTH Y;
- (3) Metal pony truss bridge located on Dike Road over the east fork of the Rock River;
- (4) Metal overhead truss bridge located on Dorham Road over the east branch of the Rock River;

- (5) Stone House – Italianate, located on the north side of Bay View Road .5 mile west of CTH TW;
- (6) Cream Brick Cross Gabled House located on the west side of CTH TW .4 mile south of Strange Road;
- (7) Cream Brick Italianate house located on the north side of Wool Road .4 mile east of CTH TW;
- (8) Brick Colonial Revival house located on the north side of Zion Church Road 1 mile east of STH 67;
- (9) Wooden Utilitarian Building located on the north side of Zions Church Road 1 mile east of STH 67;
- (10) Wooden small animal building located on the north side of Zions Church Road 1 mile east of STH 67;
- (11) Utilitarian outbuildings located on the north side of Zions Church Road 1 mile east of STH 67;
- (12) Fieldstone Side-Gabled house located on the north side of Rausch’s Hill Road .4 mile east of CTH TW;
- (13) Stone House located on the east side of CTH V .7 mile south of Petit Road; and a
- (14) Drop Siding Bath House located in the Horicon Wildlife Area.

## ■ **Goals, Objectives, Policies, and Recommendations**

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The goals, objectives, policies and recommendations for this element are found in Chapter B.