

Minnehaha County Rural Development Site Analysis

A Study by
South Eastern Council of Governments

Funded by the South Dakota Value Added Agriculture Subfund

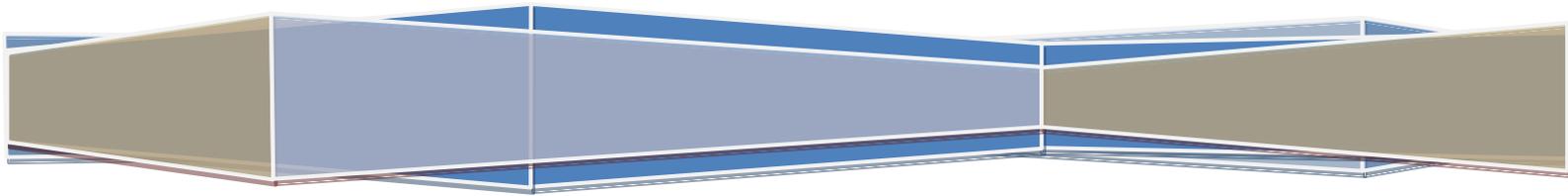


TABLE OF CONTENTS

SUMMARY	2
• Program History	2
• Methodology.....	2
• Limiting Factors	3
• Results	4
APPENDIX I – SITE ASSESSMENT CRITERIA.....	9
• Land Use Regulations	10
• Environmental	15
• Infrastructure	15
APPENDIX II – RESEARCH AND METHODOLGY	19
APPENDIX III - CONTACT INFORMATION	24
LIST OF TABLES	
• Table 1 Site Characteristics Criteria	3
• Table 2 Minnehaha County CAFO Sites by Hierarchy Classification	4
• Table 3 Minnehaha County AID Sites by Hierarchy Classification	4
• Table A1 Site Characteristics Criteria	19
• Table A2 CAFO Hierarchy Classification Requirements	20
• Table A3 AID Hierarchy Classification Requirements	22
• Table A4 Minnehaha County CAFO Sites by Hierarchy Classification	23
• Table A5 Minnehaha County AID Sites by Hierarchy Classification	23
LIST OF MAPS	
• Potential High Water Use CAFO Development Sites Map (Township)	5
• Potential Low Water Use CAFO Development Sites Map (Township)	6
• Potential High Water Use AID Development Sites Map (Township)	7
• Potential Low Water Use AID Development Sites Map (Township)	8
• Minnehaha County Location Map	9

Summary

Program History

As part of the South Dakota Department of Agriculture's (SDDA) efforts to enhance economic development opportunities and better support local control of development, the County Site Analysis Program (Program) was developed in the summer of 2013. The Program assists participating counties in identifying potential rural properties with site development opportunities. The analysis and subsequent report will provide local leaders with information and research-based resources to foster well informed decisions regarding the future of their respective regions. It also helps identify and plan for potential challenges that may arise should those opportunities be pursued.

In implementing the Program, SDDA is working closely with South Dakota's Planning and Development Districts. The First District Association of Local Governments (First District) and Planning and Development District III (District III) developed a methodology for a feasibility analysis that focuses on identifying locations for rural economic development. The methodology addresses the feasibility of locations for the development of concentrated animal feeding operations, agricultural processing and storage facilities, and other agriculturally-related commercial/industrial development. The analysis takes into consideration local zoning and State permitting requirements along with the availability of infrastructure necessary to accommodate certain rural economic development projects.

The identification of each prospective site's relative advantages and constraints provides decision-makers with useful information for assessing the development potential of each site. The information contained herein has the potential to streamline the marketing process thereby reducing timelines, financial expenditures and labor costs. Local governments, landowners, economic development groups and state agencies such as the Department of Agriculture or Governor's Office of Economic Development all benefit from the rural site development analysis. These entities now have access to a marketing tool based on proactive planning efforts. In addition, the report may assist local governments in updating their comprehensive plans, zoning ordinances and permitting procedures while also increasing local awareness of potential development opportunities.

Methodology

The analysis methodology developed for this study utilized an established set of criteria deemed critical to further development of the subject properties while specifically addressing the suitability of a site for either a concentrated animal feeding operation (CAFO) or an Agriculturally-related Industrial Development (AID). **Table 1** lists the site assessment criteria identified as being necessary in order to conduct analysis of the potential sites. Minimum thresholds for each criterion were utilized to establish a hierarchy classification of "Good", "Better" and "Best" sites. Those sites designated as "Best" sites were those not limited by any of the criteria considered. Sites not meeting the minimum criteria required of the "Best" sites were subsequently identified as "Good" or "Better".

Specific information regarding the Site Assessment Criteria and methodology utilized for developing the "Good", "Better", and "Best" hierarchy may be found in **Appendix I and II**, respectively.

Table 1: Site Assessment Criteria

CAFO/AID Criteria
Access to County and State Road Network
Proximity to Three-phase Electricity Supply
Proximity to Rural Water System
Capacity of Rural Water System
Location of Shallow Aquifer
Existing Zoning Districts/Land Use Plans
Buildable Parcel
County CAFO Zoning Setback Requirements*
Proximity to Rural Residences* & Communities
Proximity to Rail**

*CAFO Assessment Criteria Only

** AID Assessment Criteria Only

Limiting Factors

While this report focuses on the specific sites matching the site assessment criteria standards, it became apparent that each site also possesses its own unique set of site characteristics which present both advantages and constraints. For example, there are sites in the county which complied with the county's zoning regulations but lacked the necessary infrastructure.

The analysis found that the primary limiting factors in reviewing the development potential of properties within Minnehaha County for CAFO site development is population density. The primary limiting factor in reviewing the development potential of properties within Minnehaha County for a "Better" or "Best" AID site development is access to rural water service. Access to a centralized water source such as rural water was a key criterion in the site analysis process.

In addition to population density and the availability of quality potable water, additional limiting factors such as access to County and State road networks, three phase power, rail, and the County's existing CAFO setback requirements limited the number of potential AID and CAFO sites.

The site assessment process was limited in scope to include undeveloped parcels and did not consider expansion of existing CAFOs or commercial/industrial uses. In addition to this limited scope, minimum values were utilized in ranking each site with regards to zoning requirements and infrastructure demands. No attempt was made to rank each site within the three identified classifications. The uniqueness of each criterion identified in **Table 1** warrants a comprehensive review of the potential impact each may have upon a subject property. This study is intended as the first step of a multi-faceted development process potentially leading to more specific site evaluations such as Phase 1 Environmental Assessments, engineering plans, development cost analysis, etc.

Results

Identifying and evaluating potential sites for development is the first step in planning for economic development in rural Minnehaha County. The findings of this report will assist in determining the potential role each site may play in supporting economic development and should be considered when planning for future projects within Minnehaha County.

Utilizing Geographic Information System (GIS) technology, the South Eastern Council of Governments identified **0** sites within Minnehaha County that met the minimum site assessment standards of the CAFO analysis, **Table 2**, and **182** sites that met the minimum standards of the AID analysis, **Table 3**. These sites complied with local zoning ordinances and were in close proximity to infrastructure necessary to support the previously identified economic development activities.

The CAFO and AID Analysis Maps further detail High Water Use (HWU) and Low Water Use (LWU) CAFO and AID sites. HWU CAFO sites are those locations which require 150,000 gallons of water per day. This amount of water is necessary to support, for example, a 3,000 head dairy. LWU CAFO sites are those locations which require 30,000 gallons of water per day, a volume necessary to support either a 600 head dairy or 5,000 head sow operation. HWU AID sites are those locations which require water at levels necessary to support high water uses such as food processing or ethanol production. The water requirement for a HWU AID site is 410,000 gallons of water per day. This high water use is currently unable to be supported by the rural water system. Therefore, no sites were found to be acceptable for a HWU AID. LWU AID sites are those locations which have the capacity to provide water at levels necessary to support most agriculturally-related commercial/industrial development, 30,000 gallons per day. The analysis identified **182** Low Water Use AID sites and **0** sites which could be used for either High Water Use or Low Water Use CAFO development. The following maps provide information at a township level regarding the number of “Good”, “Better” and “Best” CAFO and AID sites.

**Table 2:
Minnehaha County CAFO Sites by Hierarchy Classification**

CAFO Site Classification	Good Sites	Better Sites	Best Sites
Low Water CAFO	0	0	0
High Water CAFO	0	0	0

**Table 3:
Minnehaha County AID Sites by Hierarchy Classification**

AID Site Classification	Good Sites	Better Sites	Best Sites
Low Water AID	181	1	0
High Water AID	0	0	0

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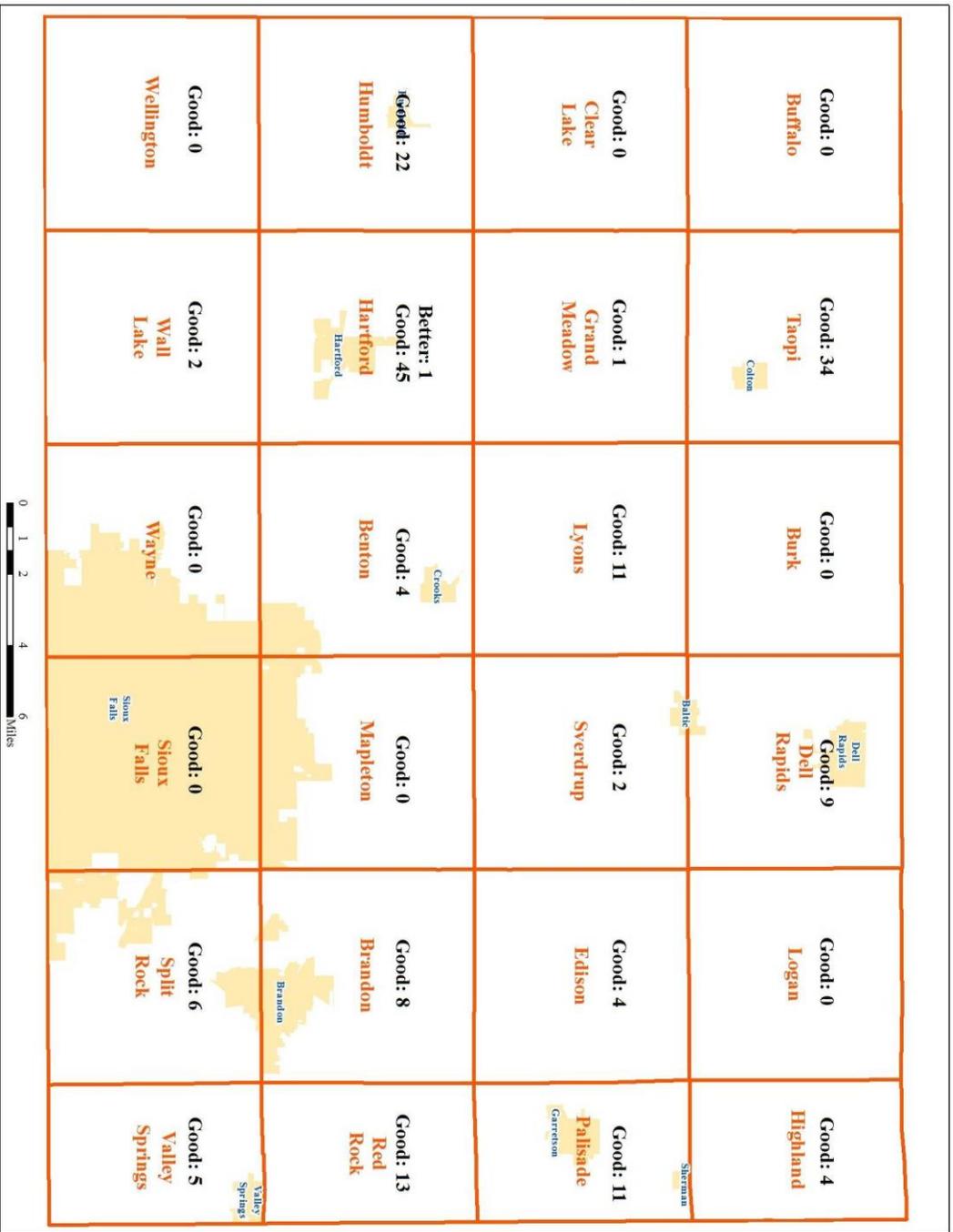
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No High Water Use AID Map – Page Left Blank

Minnehaha County

Low-Water AID Sites 2015

Township	Best	Better	Good
Benton	0	0	4
Brandon	0	0	8
Buffalo	0	0	0
Burk	0	0	0
Clear Lake	0	0	0
Dell Rapids	0	0	9
Edson	0	0	4
Grand Meadow	0	0	1
Hartford	0	1	46
Highland	0	0	1
Humboldt	0	0	22
Logan	0	0	0
Lyons	0	0	11
Mapleton	0	0	0
Palsade	0	0	11
Red Rock	0	0	13
Stoux Falls	0	0	0
Split Rock	0	0	6
Sverdrup	0	0	2
Taopi	0	0	34
Valley Springs	0	0	5
Wall Lake	0	0	2
Wayne	0	0	0
Wellington	0	0	0



APPENDIX I: SITE ASSESSMENT CRITERIA

Minnehaha County Location Map



The methodology developed for this study utilized an established set of criteria deemed critical to further the development of the subject properties while specifically addressing the suitability of a site for either a CAFO or an AID.

Sites possessing all of the criteria identified as critical within the analysis will be those most sought by potential developers. The occurrence of these sites may be somewhat rare. Therefore sites under consideration for either a CAFO or AID may meet the majority of criteria, but may also be lacking in several specific areas. Any sites not meeting all the criteria may be burdened with a limitation thus requiring more specific analysis. In these cases, the feasibility of developing the site is highly dependent upon the identified limitation(s).

A limiting condition could be the availability of water volume at an identified potential CAFO site. For example, the water demand for a 3,000 head dairy is approximately five times greater than the needs of a 5,000 head sow operation even though each operation could generally be subject to similar zoning regulations. In this situation, the lack of water at a volume necessary for a dairy may lend the site to be more likely identified as a possible location for a swine facility. It should be noted that neither this example nor the analysis explores potential alternatives to the absence of adequate rural water volume such as upsizing water distribution infrastructure or securing an alternative water source, all of which hold the potential to mitigate this constraint thereby facilitating the proposed development. Rather, the analysis recognizes upgrading infrastructure identified as necessary to support rural economic development projects may increase the number of developable sites within the County. In other cases, failure to meet certain criteria, such as access to a quality road network, may result in a situation where development of the site becomes economically unfeasible.

The site assessment criteria, depending upon whether or not the site is for a CAFO or AID project, have been divided into the three major categories of **Land Use Regulations**; **Environmental Constraints**; and **Infrastructure**.

LAND USE REGULATIONS

Economic development planning in Minnehaha County must be conducted in concert with the county's overall economic development goals. All development activities, including those specifically related to agriculture need to be accomplished within the parameters set forth in local and regional planning documents. Land use or development guidance is traditionally provided via local documents such as **Comprehensive Plans, Zoning Ordinances, Policies, Mission Statements** and other local economic development plans and initiatives. The analysis reviewed said documents in order to determine compliance with proposed CAFO and AID development. The following is a synopsis of County policies regarding CAFO and AID development.

Comprehensive Land Use Plan

Minnehaha County's most recent Comprehensive Plan was developed in 2015. The plan does not specifically address the need for an adequate supply of animal agricultural development. The plan provides the following policies regarding general agricultural development and commercial and industrial development.

Agricultural Land Use Policies

Growth Management

Agriculture – Goals and Actions

Goal 1. Conserve agricultural land for long-term agricultural use in order to protect the productive natural resources of the County and maintain the farm and farm-related economy of the County.

Action 1.1 Create more restrictive standards for residential building eligibility transfers outside of municipal growth boundaries.

Action 1.2 Reinforce that residential eligibility transfers are not a permissive use.

Action 1.3 Continue requiring the right-to-farm notice covenant on all residential building sites.

Goal 2. Discourage rural residential development in agricultural production areas.

Action 2.1 Allow the clustering of residential structures on non-productive agricultural land through the use of density zoning in the A-1 Agricultural and R/C Recreation/Conservation zoning districts.

Action 2.2 Adopt setback standards which would limit new dwellings from locating in close proximity to concentrated animal feeding operations.

Goal 3. Develop a community food system study in support of the agricultural industry and maintaining healthy lifestyles.

Action 3.1 Initiate public outreach through education and awareness to assess priorities.

Action 3.2 Identify policies directly affecting the promotion and implementation of community food systems.

Goal 4. Stem the premature and unnecessary conversion of agricultural land to urban uses.

Action 4.1 Ensure that municipal utilities are available or planned for the area prior to conversion.

Action 4.2 Initiate a Farm Advisory Board to support the future of farm operations in Minnehaha County.

Goal 5. Recognize that agricultural lands have a definite public value as open space, and the preservation in agricultural production of such lands constitutes an important physical, social, aesthetic, and economic asset.

Action 5.1 Promote sustainable use and management of productive landscapes.

Action 5.2 Maintain economic links to the value of rural land other than development uses.

Future Land Use Plan

Agricultural Production Area

The purpose of this planning category is to protect, preserve, and promote agricultural uses and the economic viability of farming operations. Agriculture is recognized in this plan as an important part of the economy, history, and quality of life. As a result of the importance of agriculture as well as limited infrastructure in this area, non-agricultural development should be limited to suitable areas and residential development should likewise continue at the limited density of one residential building eligibility per 40 acres. Agricultural uses within this area should be allowed to continue and expand where little or no conflicts exist.

Transition Area

The transition areas within the county have the primary purpose of maintaining the rural landscape until the eventual development of residential and/or municipal development. Large - scale farming will still be permitted, but additional considerations should be given to the expansion of certain types of agriculture such as large concentrated animal feeding operations and agri-businesses to ensure that large investments are not made in areas of impending development. It is likely that small-scale farms will grow in number in the transition areas to take advantage of market proximity and smaller parcel sizes.

Goals and Actions

Goal 3. Protect, preserve, and promote agricultural uses and the economic viability of farming operations.

Action 3.1 Limit residential development in areas planned for long-term agriculture to low densities and clusters that preserve the majority of the land for agricultural purposes.

- Action 3.2 Direct new non-agricultural development towards designated rural service areas.
- Action 3.3 Support local, state, and federal programs designed to assist farming operations, support conservation and natural resource management programs, and provide educational and public information services.
- Action 3.4 Support and encourage clustering of building eligibilities to protect prime agricultural lands.
- Action 3.5 Evaluate potential constraints for operation and expansion of agriculture production such as separation criteria for concentrated animal feeding operations.
- Action 3.6 Utilize Geographic Information Systems (GIS) to evaluate criteria for eligibility transfers and conditional use permits within the agricultural production area.

Commercial/Industrial Land Use Policies

Growth Management

Commercial/Industrial – Goals and Actions

Goal 1. Support and encourage growth of the county’s economic base and promote the retention/expansion of job creation.

- Action 1.1 Coordinate the siting of industrial uses with the Minnehaha County Economic Development Association.
- Action 1.2 Enhance industrial development by restricting incompatible land uses where rail access is available.
- Action 1.3 Discourage strip commercial development along transportation arteries, particularly those which serve as gateways to municipalities and attractions.
- Action 1.4 Locate commercial uses at interstate highway interchanges and high traffic intersections to support highway users.

Goal 2. Enhance communication and cooperation among the several governmental and quasi-governmental entities who have the potential to impact and influence development patterns.

- Action 2.1 Encourage a pattern of development in transition areas that can be integrated into municipal planning areas without the need for costly and inefficient public infrastructure expenditures.
- Action 2.2 Promote cooperative efforts with municipalities in dealing with growth and development issues.
- Action 2.3 Encourage annexation of potential development sites within municipal fringe areas before development plans are approved.

Goal 3. Ensure maximum efficiency in the provision of public services and facilities to promote cohesive and attractive development in the rural area.

- Action 3.1 Work with Minnehaha Community Water Corporation to ensure that future water system improvements do not conflict with county development policies and the long term viability of agricultural operations.

- Action 3.2 Limit rural densities so that current service levels are not exceeded to avoid the creation of additional special purpose districts (i.e. sanitary, water, and road districts).
- Action 3.3 Utilize the planned development zoning district to accommodate a mix of land uses, promote the arrangement of uses on a comprehensive rather than piecemeal basis, and address problems related to existing land use patterns.

Future Land Use Plan

Rural Service Areas

Limited unincorporated development is desirable within rural service areas in order to provide for the needs of rural residents and certain types of businesses. Major intersections that are designated rural service areas on the 2035 Future Land Use Map will receive growth pressure to expand with industrial and commercial uses through the duration of this plan. Expansion should be allowed and encouraged at these intersections, but limitations such as extent of area, storm water management, street access, and utilities should guide future growth. In some areas, mixed-use development can be considered as a way to minimize the development footprint and encourage growth of rural service areas. Community type rural service areas will experience growth in commercial, industrial, and residential uses. Planning for this growth should consider the existing land use, available utilities, and planning areas among other considerations. The availability of sanitary sewer has been and will be a primary concern for expansion of any rural service area.

Goals and Actions

Goal 5. Support the orderly development of non-agricultural land uses.

- Action 5.1 Support development around rural service areas and intersections that are delineated on the land use map and are compatible with existing land uses.
- Action 5.2 Discourage commercial, industrial, and residential strip development of land along transportation routes, particularly along those that serve as a municipal gateway.
- Action 5.3 Locate residential subdivisions in community type developments where adequate services are available including but not limited to sanitary sewer, utilities, and drinking water supply.
- Action 5.4 Enforce the Minimum Road Improvements and Design Standards article of the Subdivision Ordinance.
- Action 5.5 Utilize preliminary subdivision plan approval process to discourage strip development, create conformity among other development plans, and encourage joint access for subdivisions.

Zoning

Ideally, economic developers seek sites that are zoned and eligible for specific uses. The need to pursue a zoning change or conditional use permit introduces an additional step in the development process thus increasing development timeframes and costs. These steps or requirements also increase the uncertainty of approval given zoning changes are referable.

While the rural areas of Minnehaha County are reserved for agricultural uses, certain agricultural uses may require a case by case review. Generally speaking, concentrated animal feeding operations are one of the aforementioned uses. It is important to emphasize agricultural producers must maintain flexibility in their operations. Grain farmers are now choosing to spread their expenses over more acres to generate a small return over more acres. Like grain farmers, numerous livestock producers are choosing to accept smaller gains over larger numbers of animals to remain solvent. Minnehaha County's leadership recognizes a diverse agricultural industry, relying on cash crop and animal agriculture, promotes a sustainable, balanced agricultural economy. Concentrated animal feeding operations further these goals as they create a demand for crops grown in the area, provide fertilizer for surrounding land, and yield a raw product which is, in some cases, directly sold to local residents.

Concentrated Animal Feeding Operation Setbacks

Minnehaha County utilizes graduated setback requirements based upon the size of the CAFO. A 3,000 head dairy is required to observe a minimum setback of **12,540 feet** from established residences, schools, churches, and businesses. They must also be **13,200 feet** from public parks. Regarding setbacks from municipalities, the same 3,000 head dairy would be required to meet a setback of **22,400 feet**. A 5,000 head swine operation is required to observe a minimum setback of **6,380 feet** from established residences, schools, churches, and businesses, and **7,040 feet** from public parks. Regarding setbacks from municipalities, the same 3,000 head dairy would be required to meet a setback of **13,200 feet**. Both the dairy and swine operation would also be required to be set **500 feet** from lakes, rivers and streams considered fisheries. Further all CAFO's are **prohibited in a designated 100 year flood plain** as well as the **Water Source Protection Overlay District**. If a proposed CAFO site cannot meet setbacks those requirements may be waived if the applicant can provide a signed waiver from each landowner located closer than the minimum separation criteria. In the absence of a waiver, documentation shall be presented on new technology, management practices, topographic features, soil conditions, or other factors which substantiate a reduction in the minimum separation criteria.

Commercial/Industrial Development

Minnehaha County's commercial and industrial properties are areas generally adjacent to county and state hard surface roads. Commercial and industrial activities located in rural areas are generally not conducive to municipal or populated locales.

Buildable Parcel

One criterion deemed necessary to facilitate development of either a CAFO or an AID was land area. A parcel of 40 buildable acres was set as the minimum for consideration within the analysis. In order to be considered, the property must have consisted of 40 contiguous acres and able to support development upon all 40 acres. Parcels without 40 buildable acres were not considered in the final analysis.

Proximity to Communities

The AID analysis also considered sites within one mile of a community or at specific locations identified by the County. This was done because many communities and counties have established growth plans for economic development within certain proximities of communities or at locations with existing infrastructure such as paved roads. Also since the parameters of the original AID analysis excluded all AID sites within counties without access to rail, the criterion of “proximity to a community” was defined as an adequate alternative for counties lacking rail facilities.

ENVIRONMENTAL

The location of shallow aquifers in relation to potential development sites was included in the analysis. In reviewing shallow aquifers it is critical to note that they are included in the analysis for two distinct and very different reasons. Shallow aquifers may be utilized as a potential water source to support development. These same aquifers are also vulnerable to pollution due to their proximity to the surface and may be required to be protected via setbacks and development limitations.

Based upon Minnehaha County’s existing aquifer protection regulations, no site will be considered eligible if located over a shallow aquifer. However, sites can be considered for development if the applicant can show by appropriate soil borings that a site is appropriate for development.

The analysis did consider local zoning setbacks from waters identified as fisheries by the State of South Dakota.

Prior to or contingent upon acquiring a parcel it is assumed other environmental factors potentially affecting the property would be addressed via a Phase I Environmental Assessment or similar process. It is recommended that developers consider undertaking such an inquiry prior to executing a major commitment to a particular location over a shallow aquifer.

INFRASTRUCTURE

The term infrastructure is broad though in the context of property development the term includes essential services such as water, sewer, electrical, telecommunications and roads. With regards to the rural site analysis process; access to quality roads, electrical capacity and water supply were deemed essential and identified as site selection criteria.

Transportation

Access to quality roads was identified as critical to determining the development potential of a parcel. As such, the proximity of a potential development site to either a state or county road was established as one of the parameters in conducting the rural site analysis. The South Dakota Department of Transportation’s road layer was used to identify roads and surface types. Sites accessed only by township roads that were located further than one mile from the intersection of a County or State surface road were eliminated from the analysis.

A potential development site's proximity to certain road types impacted its designation. Those parcels abutting hard surface roads were consistently ranked higher than those served by gravel roads. In reviewing CAFO and AID sites, parcels adjacent to a County or State hard surface roads were designated "Better" or "Best" for transportation resources. Parcels within one mile of an intersection with a County or State road were designated "Good" for CAFO sites. Parcels within one mile of an intersection with a County or State hard surface road were designated "Good" for CAFO sites.

Access to rail was also considered to be an important factor in locating an AID site. Parcels adjacent to rail facilities were designated "Best". Parcels within one-half mile of rail were designated "Better" and those parcels within one mile of rail were designated "Good". In addition, the analysis also considered sites within one mile of a community or at locations identified by the County, with or without rail. Those parcels within one mile of a municipality or at locations identified by the County that met necessary requirements, except access to rail, were designated as "Good" and "Better".

Electric Supply

Access to three-phase power was designated as a site characteristics criterion for both CAFO and AID development. South Eastern Council of Governments contacted Sioux Valley Energy to obtain the location and capacity of the three-phase infrastructure within the county. All potential CAFO or AID developable parcels adjacent to a three-phase power were designated "Best" for electricity resources. Whereas, parcels within one mile of a three-phase power line were designated "Better" and those within two miles of a three-phase power line were designated "Good".

Water Supply

The ability to secure specific information regarding a rural water system's operations to include storage, distribution, and capacities proved to be the most complex and difficult component of the infrastructure analysis. Due to this, water resources were evaluated differently than transportation and electric infrastructure. While transportation and electric infrastructure were classified based primarily upon proximity to roads and three-phase power, the analysis of rural water systems first required the evaluation of the water system, specifically, each system's supply and distribution capacities.

Development sites were then were selected based upon the proximity to water service. The classifications with regards to water supply and their respective criteria are as follows:

1. "Best" Classification

a. CAFO

- i. High Water Use CAFO Site - If the site was adjacent to or within an area where a rural water system had sufficient supply ***and*** distribution capacity to provide 150,000 gallons per day, the site area was designated as "Best" for water resources.
- ii. Low Water Use CAFO Site - If the site was adjacent to or within an area where a rural water system had sufficient supply ***and*** distribution capacity to provide 30,000 gallons per day, the site area was designated as "Best" for water resources.

b. AID

- i. High Water Use AID Site - If the site was adjacent to or within an area where a rural water system had sufficient supply and distribution capacity to provide 410,000 gallons per day, the site area was designated as “Best” for water resources.
- ii. Low Water Use AID Site - If the site was adjacent to or within an area where a rural water system had sufficient supply and distribution capacity to provide 30,000 gallons per day, the site area was designated as “Best” for water resources.

2. **“Better” Classification**

a. CAFO

- i. High Water Use CAFO Site - If the site was within an area where a rural water system had either a sufficient supply or distribution capacity to provide 150,000 gallons per day, the site area was designated as “Better” for water resources.
- ii. Low Water Use CAFO Site - If the site was within an area where a rural water system had either a sufficient supply or distribution capacity to provide 30,000 gallons per day, the site area was designated as “Better” for water resources.

b. AID

- i. High Water Use AID Site - If the site was within an area where a rural water system had either a sufficient supply or distribution capacity to provide 410,000 gallons per day, the site was designated as “Better” for water resources.
- ii. Low Water Use AID Site - If the site was within an area where a rural water system had either a sufficient supply or distribution capacity to provide 30,000 gallons per day, the site area was designated as “Better” for water resources.

3. **“Good” Classification**

- a. In the event the Rural Water System had neither supply nor distribution capacity to serve either a Low or High Water Use CAFO or a Low or High Water Use AID as defined above a “Good” designation was applied to those locations located within two miles but no closer than one-half mile of a shallow aquifer. The designation as “Good” for water resources was not applied to High Water Use AID sites due to the water volume requirements of High Water Use AID sites and the lack of available data regarding the capacity of shallow aquifers. Therefore High Water Use AID sites without a water resource designation of “Better” or “Best” were deemed unusable for the purpose of the analysis.

The site analysis sought to address whether the rural water system serving the region had excess water treatment capacity (supply) as well as their ability to serve potential properties (distribution). In order to address the issue of supply the South Eastern Council of Governments requested location and capacity information from the two rural water providers within Minnehaha County. T-M Rural Water provides rural water to the majority of the county. South Lincoln Rural Water System provides water to the east edge of the county, only coming into places where T-M

cannot serve. Each system was requested to provide information regarding their available treated water capacity. In addition, each system was asked to notate on maps those geographic areas where distribution capacity existed which could provide water volumes at 30,000, 150,000, and 410,000 gallons per day, respectively.

Minnehaha Community Water Corp is confident that capacity may be available to provide water to High Water CAFO sites along their lines in the central portion of the county in the areas around Crooks, Hartford Colton, Baltic, and down toward Brandon with no or only minor improvements needed to their system. Minnehaha CWC is confident that they may have the capacity provide the same area with a few small expansions with water to serve a Low Water CAFO or Low Water AID site with little or no improvements needed to their system. Minnehaha CWC was clear, however, that these are only sites that have the distribution capacity, water supply would have to be analyzed to assess impacts on the current system.

There were no locations within the rural water distribution system that could accommodate the High Water Use AID site "Best" requirement of 410,000 gallons per day. .

APPENDIX 2: RESEARCH AND METHODOLOGY

This section describes the methodology utilized to evaluate the suitability of potential CAFO or AID development sites.

Step 1: Identification of Site Assessment Criteria

Table A1 lists the site assessment criteria identified as being necessary in order to conduct analysis of the potential sites. Utilizing these criteria as a guide, a variety of research methods were employed to compile the GIS data sets used in the analysis. This included the examination of local, regional, and state planning documents and existing GIS data layers.

Table A1: Site Assessment Criteria

CAFO Criteria	AID Criteria
Access to County and State Road Network	Access to County and State Road Network
Proximity to Three-phase Electricity Supply	Proximity to Three-phase Electricity Supply
Proximity to Rural Water System	Proximity to Rural Water System
Capacity of Rural Water System	Capacity of Rural Water System
Location of Shallow Aquifer	Location of Shallow Aquifer
Buildable Parcel	Buildable Parcel
Existing Zoning Districts/Land Use Plans	Existing Zoning Districts/Land Use Plans
Proximity to Rural Residences & Communities	Proximity to Communities
County CAFO Zoning Setback Requirements	Proximity to Rail

Step 2: Evaluation of Site Assessment Criteria

After developing the data sets in Table A1, the analysis identified those site locations that:

1. Complied with zoning guidelines; and
2. Were in close proximity to infrastructure necessary to support either CAFO or AID development.

Concentrated Animal Feeding Operation (CAFO) Analysis

The GIS analysis removed all parcels within the county from consideration that:

1. Were not within one mile of a County or State road.
2. Were not within two miles of three phase electric power;
3. Did not meet the (County specific i.e. half mile) setback from (County specific uses i.e. - existing residences, churches, businesses and commercially zoned areas);
4. Did not meet the (County specific i.e. half mile) setback from municipalities; and
5. Were situated over the shallow aquifer (if a county has aquifer protection regulations).
6. Did not meet the minimum standards for available water.
7. Did not contain a buildable footprint of at least 40 acres.

After applying the local zoning and buildable footprint requirements to each site, the availability of necessary infrastructure was incorporated into the analysis. The general location of available water, electric and road infrastructure was applied to the remaining sites to establish “Good”, “Better” and “Best” hierarchy of potential development sites. **Table A2** exhibits the minimum requirements necessary for a site to be classified as “Good”, “Better” or “Best” for **CAFO development**.

Table A2: CAFO Hierarchy Classification Requirements

Location Criteria	Description	Good	Better	Best
Roads	Site is <u>adjacent</u> to County/State hard surface road		X	X
	Site is within <u>one (1) mile</u> of an intersection with a County/State road	X		
Water	Site is <u>adjacent</u> to rural water system area that has both supply <u>and</u> distribution capacity to provide 150,000 gallons per day or 30,000 gallons per day			X
	Site is <u>adjacent</u> to or within rural water system area that has either supply <u>or</u> distribution capacity to serve either 150,000 gallons per day or 30,000 gallons per day		X	
	Site is within <u>two (2) miles</u> but no closer than <u>½ mile</u> of shallow aquifer in those counties <u>with</u> aquifer protection regulations or Site is within <u>two (2) miles</u> of shallow aquifer and may be located over shallow aquifer in those counties <u>without</u> aquifer protection regulations	X		
Electricity	Site is <u>adjacent</u> to three phase power			X
	Site is within <u>one (1) mile</u> of three phase power		X	
	Site is within <u>two (2) miles</u> of three phase power	X		
Zoning	Site meets county zoning setback requirements	X	X	X
Aquifer	Site meets county aquifer protection regulations (if applicable)	X	X	X
Buildable Parcel	Site contains buildable area of at least forty (<u>40</u>) acres	X	X	X

Agriculturally-related Industrial Development (AID)

The GIS analysis removed all parcels within the county from consideration that:

1. Were not within one mile of a County or State hard surface road.
2. Were not within two miles of three phase electric power;
3. Were not within one mile of rail, if applicable;
4. Were not within one mile of a community or at locations identified by the county
5. Were situated over the shallow aquifer (if a county has aquifer protection regulations).
6. Did not meet the minimum standards for available water.
7. Did not contain a buildable footprint of at least 40 acres.

After applying the required location based site assessment criteria to each site, the availability of necessary infrastructure was incorporated into the analysis. The general location of available water, electric, rail and road infrastructure was applied to the remaining sites to establish “Good”, “Better” and “Best” hierarchy of potential development sites. **Table A3** exhibits the minimum requirements necessary for a site to be classified as “Good”, “Better” or “Best” **for AID development**.

Table A3: AID Hierarchy Classification Requirements

Location Criteria	Description	Good	Better	Best
Roads	Site is <u>adjacent</u> to County/State hard surface road		X	X
	Site is within <u>one (1) mile</u> of an intersection with a County/State hard surface road	X		
Rail	Site is <u>adjacent</u> to rail facility			X
	Site is within one half <u>½ mile</u> of rail facility		X	
	Site is within <u>one (1) mile</u> of rail facility	X		
Water	Site is <u>adjacent</u> to or within rural water system area that has <u>either</u> supply <u>or</u> distribution capacity to serve 410,000 gallons per day or 30,000 gallons per day			X
	Site is adjacent to or within <u>one (1) mile</u> of rural water system area that has <u>either</u> supply <u>or</u> distribution capacity to serve 410,000 gallons per day or 30,000 gallons per day		X	
	Site is within <u>two (2) miles</u> but no closer than <u>one half (½) mile</u> of shallow aquifer in those counties <u>with</u> aquifer protection regulations or Site is within <u>two (2) miles</u> of shallow aquifer and may be located over shallow aquifer in those counties <u>without</u> aquifer protection regulations	X		
Electricity	Site is <u>adjacent</u> to three phase power			X
	Site is within <u>one (1) mile</u> of three phase power		X	
	Site is within <u>two (2) miles</u> of three phase power	X		
Zoning	Site is zoned for commercial/industrial development			X
	Site is identified in land use plan for commercial/industrial development		X	
	Site is neither identified or zoned for commercial/industrial development	X		
Proximity	Site is within <u>one (1) mile</u> of community	X	X	
Aquifer	Site meets county aquifer protection regulations (if applicable)	X	X	X
Buildable	Site contains buildable area of at least forty <u>(40) acres</u>	X	X	X

Step 3: Site Development Recommendations

Based on the analysis, 0 sites were classified as Good, Better, or Best for CAFO development (**Table A4**) and 182 sites were classified as Good, Better, or Best for AID development (**Table A5**).

While this study only identifies those sites that met the required criteria for the analysis, it should be noted that other sites within the county may be satisfactory for CAFO and AID development. Sites not within the specified distance of a hard surfaced county or state road or does not have desired infrastructure (rail, water, power) within close proximity does not necessarily negate its development potential.

**Table A4:
Minnehaha County CAFO Sites by Hierarchy Classification**

CAFO Site Classification	Good Sites	Better Sites	Best Sites
Low Water CAFO	0	0	0
High Water CAFO	0	0	0

**Table A5:
Minnehaha County AID Sites by Hierarchy Classification**

AID Site Classification	Good Sites	Better Sites	Best Sites
Low Water AID	181	1	0
High Water AID	0	0	0

APPENDIX 3: CONTACT INFORMATION

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Electric Providers

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Rural Water System

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Scott Buss
605-428-3374

Other Resources - Aquifer

First Occurrence of Aquifer Materials in Minnehaha County, South Dakota
Department of Environment and Natural Resources
Division of Financial and Technical Assistance
Geological Survey Aquifer Materials Map 9
Dennis W. Tomhave, 2001
http://www.sdgs.usd.edu/pubs/PDF/AM-09_20010629.pdf