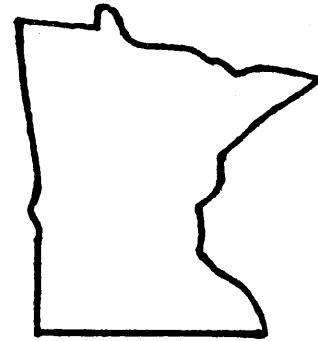


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CONSIDERATIONS IN ELECTRIC POWER PLANT SITING

Cropland Preservation

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POWER PLANT SITING PROGRAM

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SOTA ENVIRONMENTAL QUALITY BOARD

1980

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PREFACE

This document is divided into three major parts: the Introduction, the Inventory of Study Areas, and the Specific Site Selection Criteria.

The Introduction outlines the importance of agriculture in Minnesota, the amount of harvested cropland and the potential change due to conversion to other uses, the high level of public concern for agricultural land preservation, and the Minnesota Environmental Quality Board's commitment to seriously examine the relationship between agricultural lands and the siting of power plants.

The second part, the Inventory of Study Areas, presents the likely characteristics of a reasonable and workable policy for cropland preservation in the definition of power plant study areas, describes the system to identify and rank valuable and productive cropland in the inventory, and outlines the analytical model used to illustrate the results of alternative planning policies. The inventory discussion also presents examples of a range of policy alternatives and discusses the rationale for the proposed inventory criteria and planning policies.

The third part, the Specific Site Selection Criteria, describes the relevance of site specific criteria, discusses the concept of allowable removal, various cropland ranking systems, and provides an example model criterion. This part also suggests broad public input before establishing any such site specific criterion.

Cropland preservation is an important concern for many Minnesotans. The Minnesota Environmental Quality Board urges you to make your views known on cropland preservation as related to power plant siting. To express your opinions please contact:

Minnesota Environmental Quality Board
15 Capitol Square Building
550 Cedar Street
St. Paul, Minnesota 55101
612/297-2602

PART I: INTRODUCTION

Importance of Agricultural Land

Minnesota agriculture provides about one-third of the state's employment and generates nearly \$20 billion of the state's annual economic activity. Hundreds of different occupations are dependent on agri-business activities and the matrix of industry related activities that market, process, package, and distribute agricultural products. Minnesota ranks high among the leading U.S. food and fiber producers and is recognized as a major supplier in global markets.

Ever since man first began cultivating the land to provide food, the relationship between people and cropland has been a critical one. When land is scarce or soils are depleted people go hungry. Pressures on the world's croplands have escalated as world population has increased. Not only is more cropland needed but more land is needed for nonagricultural uses. Concern is being expressed all over the world about the impact of an irreversible loss of productive capacity inherent in good soil and climate.

In Minnesota the "land in farms" has decreased from the peak in 1950 of 33.3 million acres to 30.6 million acres in 1972. Since 1972 the land in farms has remained constant. However, the definition of "land in farms" includes many different types and uses of land such as cropland, pasture, woodlots, wetlands, farmsteads, roads and unproductive land. Cropland estimates have fluctuated over the last 20 years from 21.3 million acres to 22.3 million acres. However, the disparity in the various estimates seems to reflect differences in methods of collecting data rather than differences in the amount of cropland.

The amount of harvested cropland has fluctuated significantly over the last 25 years between a low of 16 million acres to the record high in 1977 of 21.9 million acres. The fluctuations depend on market prices which are affected by a wide range of factors such as government programs and world shortages or surpluses.

A recent State Planning Agency projection* estimated that more than 500,000 acres of land in farms will be withdrawn from the Minnesota agricultural base by 1993. Only a portion of the land withdrawn would be cropland; never the less, the protection of cropland as an important natural resource remains a significant concern for the state.

*Notebook of Land Use projections; Environmental Planning Division, State Planning Agency; June, 1978; page 15.

Policy Studies

Many studies, forums and conferences on the importance and the preservation of agricultural land are occurring on all levels of government and in the private sector. In January, 1978 the Soil Conservation Service, U.S. Department of Agriculture responded to Congressional directive by publishing rules for a national Important Farmlands Inventory. Also, the National Agricultural Lands Study, co-chaired by the Secretary of Agriculture and the Chairman of the Council of Environmental Quality, is in progress with a final report due in January, 1981. The Metropolitan Council's Rural Area Task Force studied agricultural preservation and their recommendations have been incorporated into the proposed Minnesota Agricultural Preserves Act (H.F. 1612, SF 1597). The Upper Minnesota Valley Regional Development Commission has also studied the issue and defined farmland important to its region.

More recently, the Minnesota Legislature, in 1979*, declared it to be the policy of the state to:

"...assure that Minnesota lands that are well suited for the production of agricultural products be used and managed primarily for that purpose by:

- (a) Maintaining optimum agricultural production;
- (b) Permanently preserving certain parcels of prime agricultural and open space land from conversion to other uses;
- (c) Attempting to guide growth and development to utilize land, resources, and capital most effectively; and
- (d) Providing relief from escalating property taxes and special assessments in agricultural areas subject to development pressures.

The legislature further finds that the public purposes to be served by this policy will be best met by:

- (a) Defining and locating lands well suited for the production of agricultural products;
- (b) Assuring that state agencies conduct their activities in a manner that considers and seeks to minimize negative impacts on agricultural activities, in accordance with other social, economic and environmental considerations.

*Minnesota Laws 1979 Chapter 315

- (c) Assuring that public agencies employ and promote the use of management procedures which maintain or enhance the natural productivity of lands well suited to the production of agricultural products; and
- (d) Providing units of local government with tools and incentives to prevent the unplanned and unscheduled conversion of agricultural and open space lands to other uses."

A joint legislative committee on agricultural land preservation was established to oversee the studies, inventories, and reports deemed necessary to carry out the intent of the policy.

Extensive citizen testimony and letters addressing concern over this issue have been received by the Minnesota Environmental Quality Council. Oral and written testimony was presented at the power plant siting rule hearings in 1977, the information meetings in 1978 on the inventory of power plant study areas, and the annual hearings in 1978 and 1979. Appendices A, B, and C are examples of the most recent concern and suggestions which the Board has received.

In March, 1978 the Minnesota Environmental Quality Board committed the power plant siting staff to seriously examine the relationship between agricultural lands and the siting of power plants in the preparation of the inventory of power plant study areas. The subsequent studies by the Power Plant Siting staff, the State Planning Agency and the Land Management Information Center have been guided by extensive public input from the 1978 inventory information meetings and the 1978-1979 Power Plant Siting Advisory Committee. In addition, advice was sought from soil scientists and agricultural experts from the University of Minnesota and the U.S. Soil Conservation Service. This eighteen month effort has resulted in Chapter VI of the 1979 Draft Inventory which contains the proposed study area criterion and planning policies.

PART II: INVENTORY OF STUDY AREAS

The emphasis in the inventory has been on agricultural cropland. Land that has an inherent productivity as a result of its natural resources such as soil type, climate, and slope which are necessary for the efficient growth of food, feed, fiber, forage, and oilseed crops. Since many other agricultural uses are not tied to the inherent productivity of the land and could, for a finite economic cost, be moved to another piece of land, it would be inappropriate to attempt to protect in some special manner all of the land that is used for agricultural purposes. These uses include feedlots, farmsteads, and other land not used for crops.

Productivity is not being considered in a purely economic sense. While it is clear that crop yield does translate into dollars, the major concern is the inherent productive capacity of the land as a natural resource. The value being considered is the ability of the land to produce crops.

Definition of Prime Lands

The definition of "prime farmland", depending on the issue, has taken on a wide variation in meaning. In many discussions the definition appears to be: "Prime farmland is my farmland." This type of definition, although it is understandable, is impossible to implement as a study area planning policy or as a realistic site selection criterion to guide power plant siting decisions. It would result in a complete exclusion of power plants from vast areas in the state regardless of the plant size or significance of impact on valuable and productive cropland. This would not be consistent with the responsibility to "choose locations that minimize adverse human and environmental impact..." as required by the Power Plant Siting Act. It might also increase the number of transmission lines that would have to be routed to bring electric power to agricultural areas from remote power plants.

The objective of a reasonable and workable policy should be to provide assured protection for the best cropland as an important natural resource and yet not completely eliminate the potential for siting a power plant in any major region of the state. A necessary corollary for the study area inventory is that the basic physical measurements of valuable and productive cropland must be available on a statewide basis.

Two general conditions must be examined in considering any definition of land. These are time and location. The productivity of cropland may be modified somewhat in time. Drainage, irrigation, use of fertilizer and erosion are four ways that the productivity of farmland can be changed or modified over time. Thus any policy must recognize a time frame and must be reviewed periodically.

Location also affects the perception of productive cropland. What is good in northern Minnesota may not be good in southern Minnesota. Location not only affects the basic characteristics of the soil and climate but it also affects the availability of markets.

In this analysis, the priority time frame is the next fifteen years. The tools developed to show the effects of any policy should be flexible enough to incorporate trends over the fifteen year period. The priority location is also narrowed down to the State of Minnesota. Within these limitations the definition of valuable and productive cropland includes the natural physical characteristics of soil and climate and the importance of the land to an area.

Identifying Cropland

There have been several attempts to develop systems for ranking soils by their production capacities but each differ in ranking purpose and criteria. Some are primarily concerned with the physical/chemical and environmental characteristics of soil. Others broaden the definition to include economic and management criteria.

The most familiar system is the Soil Conservation Service (SCS) land capability classification. This system combines very detailed soil information based on SCS county soil survey maps with economic and management criteria. The mapping units are as small as 2 1/2 to 3 acres. The primary drawback to this system is its lack of availability on a statewide basis. Only 30 of Minnesota's 87 counties have published soil surveys. Even though an additional 4 counties will publish their surveys in the near future, the scheduling of the rest of the state indicates that complete coverage will not be available until 1990 or later.

The State Planning Agency (SPA) has published a report entitled "Minnesota Cropland Resources." The objective of this study was to rank all land in Minnesota according to its potential for crop production. Meeting this objective required that the soil and environmental factors important to crop production be quantifiable and that there be statewide coverage. This was achieved through the use of the Minnesota Soil Atlas* which contains the

*Minnesota Soil Atlas, Agricultural Extension Service, University of Minnesota.

only statewide soil information available. It provides basic soil information concerning the nature and character of the soil. The smallest area delineated in the Atlas is about 600 acres, thus it is not intended to be used in the same manner as the more detailed SCS reports. Instead, it is intended to supply the soils information needed for state and regional planning efforts.

The soil productivity characteristics from the Soil Atlas used in the SPA model are:

1. Texture of the soil above and below five feet from the surface;
2. Average soil moisture condition;
3. Color of soil as an indication of organic content;
4. Slope of the soil unit;
5. Depth of the rooting zone; and
6. Phosphorus/potassium content.

A methodology for scoring these characteristics for various soils resulted in preliminary soil scores ranging from 0 to 94. The preliminary scores were then modified by a drainage condition factor and a climate factor, based on average annual precipitation and growing season heat accumulation. The soil/climate scores were tested against SCS and U.S. Crop Reporting Service data and a good correlation was found.

The SPA soil/climate productivity ratings meet the requirements of providing consistent statewide information detailed enough for state and regional planning. This information is used to define valuable and productive cropland for the Inventory of Study Areas.

The soil/climate productivity scores developed in the SPA report range from 94 as the highest productivity to 0 as the lowest productivity. The range of scores was divided into five equal-interval groups.

<u>PRODUCTIVITY GROUP (PG)</u>	<u>SOIL/CLIMATE SCORE</u>	<u>ACRES IN MILLIONS</u>	<u>PERCENT</u>	
1	76-94	5.4	9.8	
2	57-75	9.7	17.8	Valuable and Productive Cropland
3	38-56	11.5	21.0	

4	19-37	8.0	14.7	
5	0-18	17.2	31.3	
Water	(NA)	<u>3.0</u>	<u>5.4</u>	
TOTAL		54.8	100.0	

Generally speaking, those soils in PG-1 have yields which exceed 90 bushels/acre of corn, soils in PG-2 have yields ranging from 70 to 95 bushels/acre of corn or 40 to 45 bushels/acre of wheat; soils in PG-3 have yields ranging from 50 to 75 bushels/acre of corn or 35 to 40 bushels/acre of wheat. Those soils in PG-4 and 5 are generally unsuited for productive cropland. For purposes of study area definition it has been proposed that soils in the top three groups (totalling 26.6 million acres) should be considered as "valuable and productive."

The exception to the productivity ratings are soils suitable for irrigation. Basically, these soils are sandy soils that could have a low score and without irrigation their yield on the average would be poor. With irrigation, yields are increased considerably. No definitive model has been proposed and tested to convert a normal soil/climate score to an irrigated score; however, it is apparent from field results that irrigation significantly increases the productivity to at least a PG-2 level and sometimes to PG-1 level.

Irrigation potential is dependent on an adequate water supply. Since irrigation water availability information has not been gathered throughout the whole state it would only be possible to consider those areas which are identified in the water appropriation permits issued by the Department of Natural Resources for irrigation.

The question of irrigation consideration is not an easy one to answer fully. However, for purposes of establishing a study area inventory, it has been determined that very little change would occur even if all existing irrigated land were considered as PG-1 land. This is because the irrigated land is scattered over a relatively large area and does not significantly influence the overall assessment of the areas included in the inventory.

Inventory Analytical Model

The soil/climate productivity information is stored in the Minnesota Land Management Information System which is both a depository of geographically-based information and a computer analysis system. The information is stored on computer files by forty-acre parcel for every parcel in the state. It is organized by region, county, and township and can be used for mapping or statistical analysis. Figure 1 shows in graphic form the range of scores, and the productivity groups considered as valuable and productive cropland which were used in the policy analyses.

In order to use the information in statewide analyses, the forty acre information was aggregated to a five-kilometer cell. A five-kilometer cell (about nine square miles) contains 6177 acres or about 155 forty acre parcels. Each cell is characterized by the number of forty acre parcels for each soil/climate productivity score. In this form the information can be analyzed on a statewide basis and visually displayed as a map or table.

In order to rank any five-kilometer cell some measure of probability of finding a suitable area within the cell is needed. A suitable area would include the developed portion of a plant site. The developed portion is the portion of the plant site that would definitely preclude the use of the land for crop production and is usually 300 to 800 acres (excluding cooling water reservoir) or about 10% of the five-kilometer cell.

If all the parcels in a cell are rated as highly productive, there is very little probability of finding a site within the cell which would not remove a large amount of the highly productive crop land from production. Likewise, if no parcel in the cell is rated as highly productive, there would be no problem in finding a plant site within the cell which would not affect highly productive cropland. The model allows examination of these two extremes as well as any policy which falls between them.

The analytical model was developed to allow the following flexibility:

1. To vary the policy soil/climate score above which the valuable and productive cropland should be considered "most highly productive" and thus should be protected;
2. To vary the minimum number of forty acre parcels (protected cropland concentration) needed in a five-kilometer cell for that cell to be excluded from a study area;
3. To combine a statewide policy score with a regional policy score and/or a county policy score.

Inventory Considerations and Alternatives

If all valuable and productive cropland were excluded from study areas, about 49% of the state would be excluded. However, this kind of mass exclusion is not helpful in study area planning when a range of plant sizes must be considered. The developed portion of a plant site, even for the larger units, is relatively small thus the potential is high for finding a suitable specific site which would minimize the removal of valuable and productive cropland in the excluded area. However, the objective still remains to provide assurance of protection of the best cropland but not completely eliminating potential for siting in any region.

In providing protection of the best cropland, the issue of state, regional or local "perspective" must be considered. If the state as a whole is the policy perspective, then the major concentration of "prime" land would occur in south central Minnesota where the combination of soil and climate is best, and from a statewide natural resource point of view this would be the correct perspective. However, this does not consider the regional or local importance of cropland.

Using the analytical model, several combinations were mapped to study the planning policy implications. For example, Figure 2 shows the planning policies proposed in the Draft Inventory. These policies are on a statewide basis, they define the most highly productive cropland as the highest scoring 20% of the valuable and productive cropland in the state and identify those cells in which the most highly productive cropland constitutes 75% or more of the land in a cell. Figure 3 shows graphically how this relates to the soil/climate scores and the productivity groups.

Figures 1 and 4 show a statewide planning policy of 100%, using a soil/climate score of 38 and above to identify all cropland as most highly productive, and show protected cropland concentrations of 90%, 80%, and 70%.

Figures 5 and 6 show a regional planning policy of 70% for the Upper Minnesota Valley Region using a soil/climate score of 67 and show protected cropland concentrations of 100%, 90%, 80% and 70%.

An attempt was made to use this type of analysis on a county level; however, it quickly became evident that this model could not be used. The data is not adequate and there can be major discrepancies at county boundaries where a five-kilometer cell may overlap into another county and be considered in a different category depending on which county is being analyzed. Although this boundary effect can still be present on the regional level it is less significant.

Figure 7 shows a combination state planning policy of 50% and a regional planning policy of 70% (that is, the best 50% of cropland in the state as well as the best 70% of cropland in each region) for protected cropland concentrations of 100% and 90%. The minimum soil/climate scores for these policies are shown in Table 1.

TABLE 1

Statewide Planning Policy - 50%
Soil/Climate Score - 60

Regional Planning Policy - 70%
Soil/Climate Scores

<u>RDC</u>	<u>SCORE</u>	<u>RDC</u>	<u>SCORE</u>	<u>RDC</u>	<u>SCORE</u>
1	47	6E	62	8	61
2	38	6W	67	9	77
3	38	7E	41	10	64
4	50	7W	51	11	57
5	40				

Where a regional score is lower than the state score the analytical model uses the regional score in computing that region. Where a regional score is higher than the state score the analytical model uses the state score. Combining a state policy with a regional policy has the advantage of protecting the best cropland in the state while recognizing the regional importance of other cropland.

Inventory Summary

An important tool has been developed which can illustrate the effect of a given cropland preservation policy on the Inventory of Study Areas. The data base contained in the "Minnesota Cropland Resources" report is adequate for statewide and/or regional analysis. The analytical model has the flexibility to examine a variation in the quality of protected cropland, to examine a range of protected cropland concentrations for a five kilometer cell and to combine a statewide policy with a regional policy.

In reviewing all the various policies, legal counsel to the Environmental Quality Board has expressed concern that under recent Minnesota Supreme Court decisions agricultural land broadly defined cannot be considered a protectable resource and cannot be given the same weight that protectable natural resources are to be given in determining the location of power plants. As a result, the planning policies proposed for the Inventory of Study Areas have attempted to more narrowly define the agricultural land to be protected. Thus the inventory is based on the natural characteristics of the soil and climate to provide protection for the most highly productive cropland on a statewide basis as a natural resource.

The Board's Power Plant Siting Advisory Committee, which reviewed and commented on numerous policy drafts, prepared the following comment on the proposed Inventory of Study Area policies:

"The policy on agricultural land is considerably less protective than we hoped. It has moved from fairly extensive regulation to more general concepts. This is the result of the status of agricultural land in state law, which is essentially nonprotective. We are pleased to note the current session of the Legislature approved a study commission on agricultural land. We hope this will lead to a statewide agricultural policy which will place at least the best lands in protected status. This is a vital issue. Agricultural land is a public resource that should be protected. We do note that such protection could well result in placing limits on how and under what conditions agricultural land can be converted to nonagricultural use, whether it is transmission lines and power plants or shopping centers and houses."

PART III: SPECIFIC SITE SELECTION CRITERIA

Although the criteria and planning policies in the Inventory of Study Areas do offer guidelines to be considered by a utility in making a power plant application, these do not specifically limit where a power plant may be sited. It is only in the specific site selection criteria that any real limits can be placed on the amount of highly productive agricultural land which might be removed from cropland use by the location of a power plant.

The discussion of a specific site criterion can be best considered in two parts. The first being the amount of land in a protectable category that might be used by a plant site, and secondly the ranking system to be used to classify the land. This also includes determining what class of land should be protected.

Allowable Removal

If a significant portion of the state's cropland is of a quality which should be considered for protection, then, in a practical sense, a complete exclusion is unlikely to be a workable policy. Such a policy would cause a site to be rejected by having one acre or even one square foot of protected cropland within its boundaries. Yet the site might be the best site in all other respects. Therefore, to discuss the amount of protected cropland which might be removed by a site, it is necessary to consider the overall impact of a site.

The conventional power plant site is made up of two general areas, the developed area and the buffer zone. It is only the "developed area" that need change the basic land use and for all practical purposes permanently remove cropland from production. The developed area would include the rail spur, coal pile, waste storage, buildings, transmission substation, etc. This area can be limited to 0.9-1.4 acres per megawatt (MW) of plant capacity, depending on plant size.* The exceptions to this are sites which require a cooling water reservoir. The acreage required by a reservoir varies greatly but can be extensive. However, the best terrain for reservoirs usually is sloping and thus the acreage of prime cropland needed may be considerably less than the total. In any case reservoirs should be considered separately from the rest of the site's developed area.

The buffer zone is needed to enable the utility to control the types of development which might take place next to the developed area. For example, if only the developed area were owned by the utility then an incompatible use, such as a residential area, might be developed close to the plant with the result that the plant might be in violation of noise regulations. The buffer zone might have to contain considerable acreage; however, agri-

*"Considerations In Electric Power Plant Siting: Plant Size," Minnesota Environmental Quality Board, December 7, 1979.

cultural production is compatible with allowable buffer zone activities. Thus highly productive cropland need not be taken out of production.

An estimate of the land needed over the next several years for the developed portions of new power plants can be made by examining the forecast for electrical demand.* The annual growth in electrical demand is projected to be 4.3% between 1980 and 1985, declining to somewhat more than 3% after 1985. In addition to the existing generating capacity, 1300 MW of coal-fired capacity are planned to be in service by the end of 1985. These plants are the Minnesota Power and Light 500 MW Clay-Boswell plant and the Northern States Power 800 MW Sherco 3 plant. Despite the decrease in expected growth rates, there is a projected need for an additional 2800 MW of generating capacity between 1985 and 1995. This projection includes the Minnesota Power and Light 500 MW Floodwood/Fine Lakes plant.

The total additional generating capacity that may need to be sited, according to current projections, for operation by the end of 1995 is 2300 MW. Some of this additional capacity may be supplied by new generating units outside the state of Minnesota. However, assuming the total 2300 MW capacity is sited in Minnesota, then the land required for the developed area of these plant sites would range from about 2100 to 3200 acres.

Reservoir requirements are difficult to estimate. They could range from very little to perhaps double the acreage required for the developed area of a plant site. If all plants for the additional 2300 MW capacity require reservoirs, then the total land required could be as much as 10,000 acres. If this acreage were all cropland it would represent about 0.04% of the 26.6 million acres of "valuable and productive" cropland in Minnesota.

Ranking System

The ranking system using the soil/climate productivity scores taken from the "Minnesota Cropland Resources" report, as proposed for defining power plant study areas in the inventory, is not accurate enough for site specific use. When specific sites are proposed the site can be surveyed, tested and classified according to a specific set of standards. Thus, an accurate determination of cropland productivity can be made.

Several classification systems could be considered. The SCS has two classification systems. They are the Important Farmland Inventory classification and the Capability Classification using the county soil survey information. The objective of the Important Farmland Inventory is to identify the extent and location of important rural lands needed to produce food, feed,

*Derived from estimates of the Minnesota Energy Agency presented on page 7 of the 1979 report entitled "The Governor's Report on Environmental Quality."

fiber, forage and oilseed crops. Nine national criteria are used to define prime farmlands: moisture regime, temperature regime, pH, water table, conductivity, flooding, water permeability rate, rock, and erodibility. The actual specifications used in the criteria are intended to offer a broad uniform national definition. However, Federal regulation provides the State Conservationist with the flexibility to be more restrictive in defining the specific criteria in order to assure the most accurate identification of prime farmlands for the state.

Some modification of the Important Farmland Inventory criteria might be used to identify productive cropland for use in a specific site criterion.

The SCS Capability Classification is used to show in a general way the suitability of soils for most kinds of field crops. These are based on SCS county soil surveys which are the best known and understood source of soil information. The groups are structured according to the limitations of the soils when used for field crops, the risk of damage when they are used and the way they respond to reasonable treatment.

Capability Classes are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

Classes V through VIII all have severe limitations that limit their use largely to pasture, range, woodland, or wildlife.

Many suggestions have been made (see Appendices B and C) to use the Capability Classes I and II to define the cropland which should be protected on a site specific basis. In a county which does not have a SCS soil survey any proposed site could still be assessed using the SCS criteria.

Use of the capability classes would provide a local perspective since the class determination takes into account the crops generally grown in the county and the local climate. Thus a Class I or II area in one county may have the fewest limitations and the greatest productivity for that county, yet exhibit a considerable difference in productivity when compared with a Class I or II area in another county.

Another rating system which should be considered is the Crop Equivalent Rating (CER) developed by Rust and Hanson of the Agricultural Experiment Station, University of Minnesota. This system was developed to address one of the most important decisions of farm management, that is to assess the crop potential of tracts of land. This CER approach is used for tax assessment purposes in some counties.

The decisions to cultivate land involve several possible levels of management. "Level" refers to some set of inputs of tillage, fertilizer, weed and insect control, harvesting procedures, etc. that will allow maximum yield at an affordable cost. The word "equivalent" in crop equivalent rating means, that given the diversity of crops grown in Minnesota, an effort is made to express dollar equivalence in net return for the most commonly grown crops. CER's include the gross productivity of the land at a given level of management and costs of production.

Site Specific Summary

Only a specific site selection criterion can provide a real limit on the amount of highly productive cropland which might be removed from cropland use by a power plant site. Such a criterion could set out the ranking system, the classification to be protected, and the amount which might be removed for the developed area of a site and any reservoir. An example might be:

Preferred sites do not require the removal of agricultural cropland, which would be rated as (the best categories of land according to the Capability Classification, the Important Farmland Inventory or the Crop Equivalent Rating), from its use of more than (a) (320, 640 or 1280) acres for the developed area of a site, excluding land required for a cooling reservoir, and (b) (320, 640 or 1280) acres for a cooling water reservoir.

Before any site specific criterion could be established broad public input is necessary to assess the desirability and practicality of such a rule. Also, the underlined variables in the example rule would need to be established. A site specific criterion could be either in addition to or in place of any inventory criteria and planning policies on cropland preservation.

Valuable and Productive Cropland Statewide Considerations

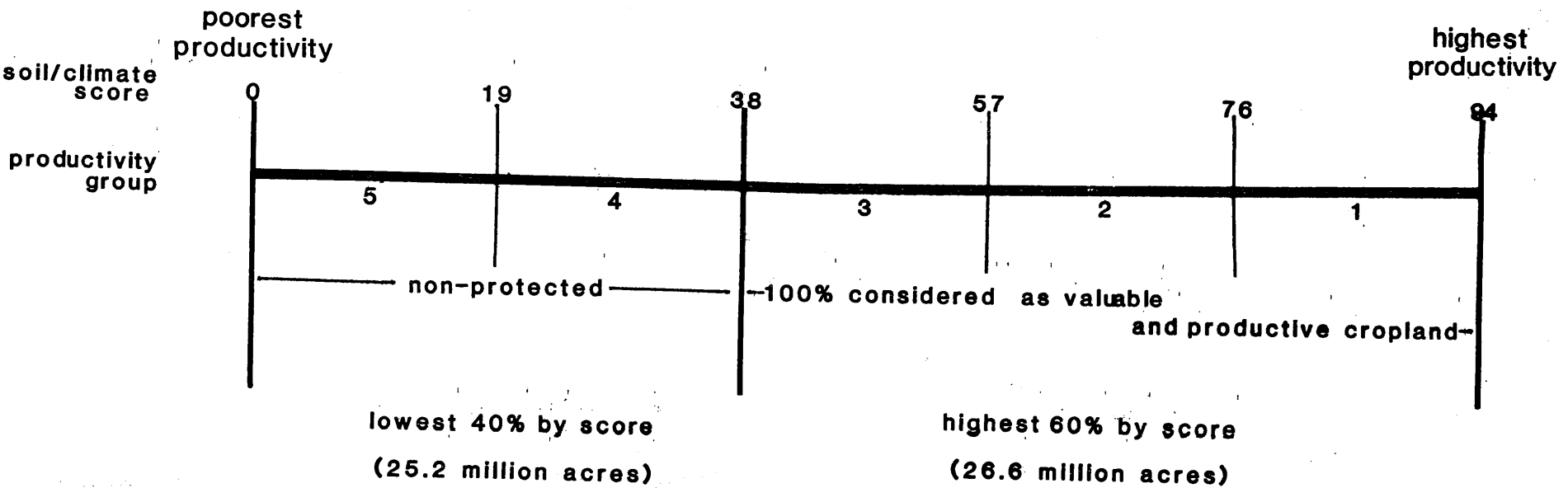


FIGURE 1

MINNESOTA ENVIRONMENTAL QUALITY BOARD

1979 INVENTORY

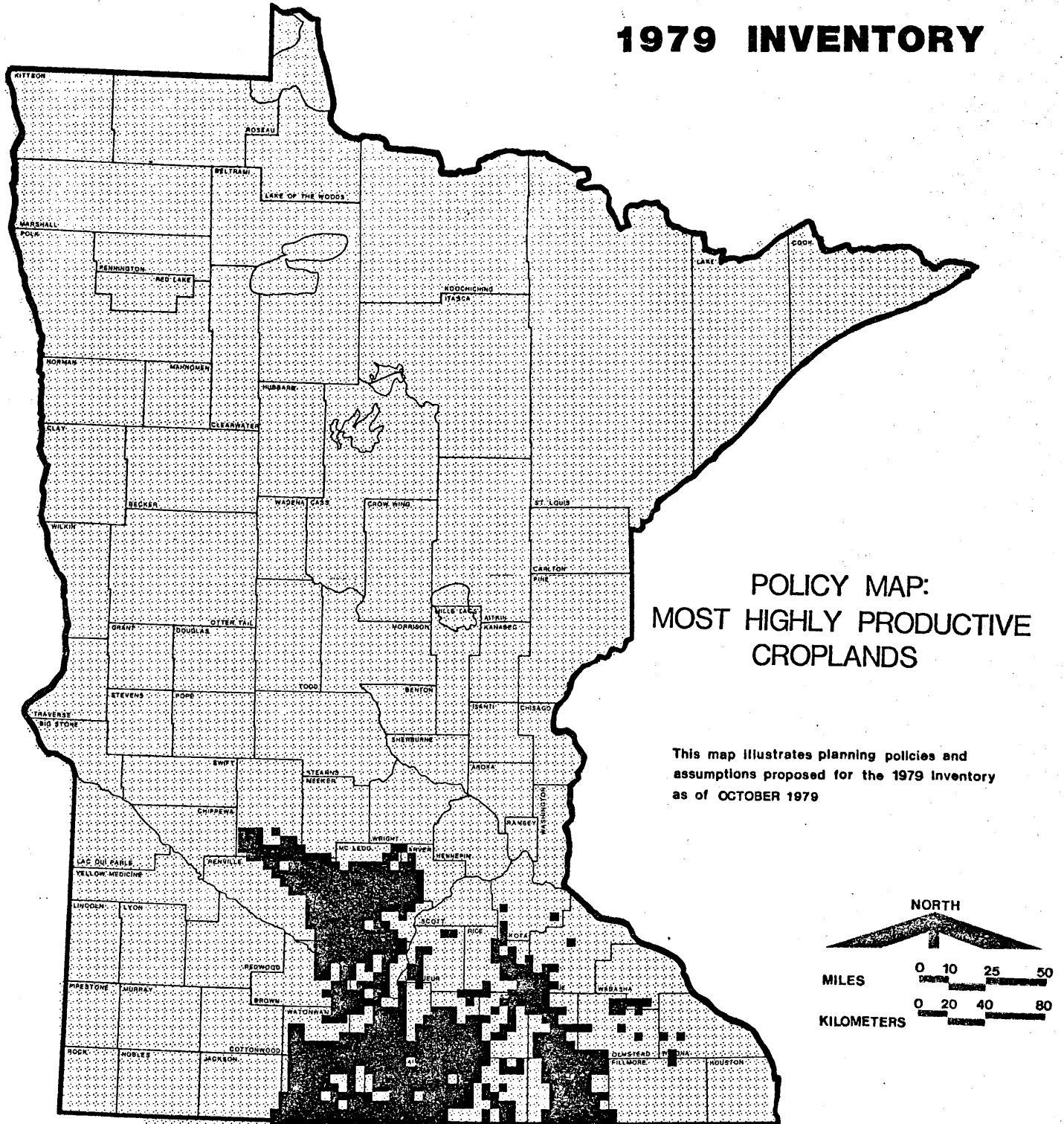


FIGURE 2

KEY FOR FIGURE 2

PERCENTAGE
OF CELLS:



LESS THAN 39 PARCELS AVAILABLE

7.5

DISCUSSION:

Figure VI-1, "Policy Map: Most Highly Productive Croplands," shows those areas of the state with concentrations of the best cropland. The proposed criteria and planning policies define the best cropland as the top twenty percent of the cropland in the state. Concentration is defined by the proposed planning policies as any five kilometer cells in which the best cropland constitutes 75% or more of the cropland in the cell. This map is not meant to take the place of the detailed land use studies needed for specific power plant applications.

Assumptions

No major assumptions were made in developing this map other than those used in developing the productivity data in Minnesota Cropland Resources.

Data Sources

Cropland productivity data for this map is from Minnesota Cropland Resources by the Minnesota State Planning Agency.

Most Highly Productive Cropland 1979 Draft Inventory

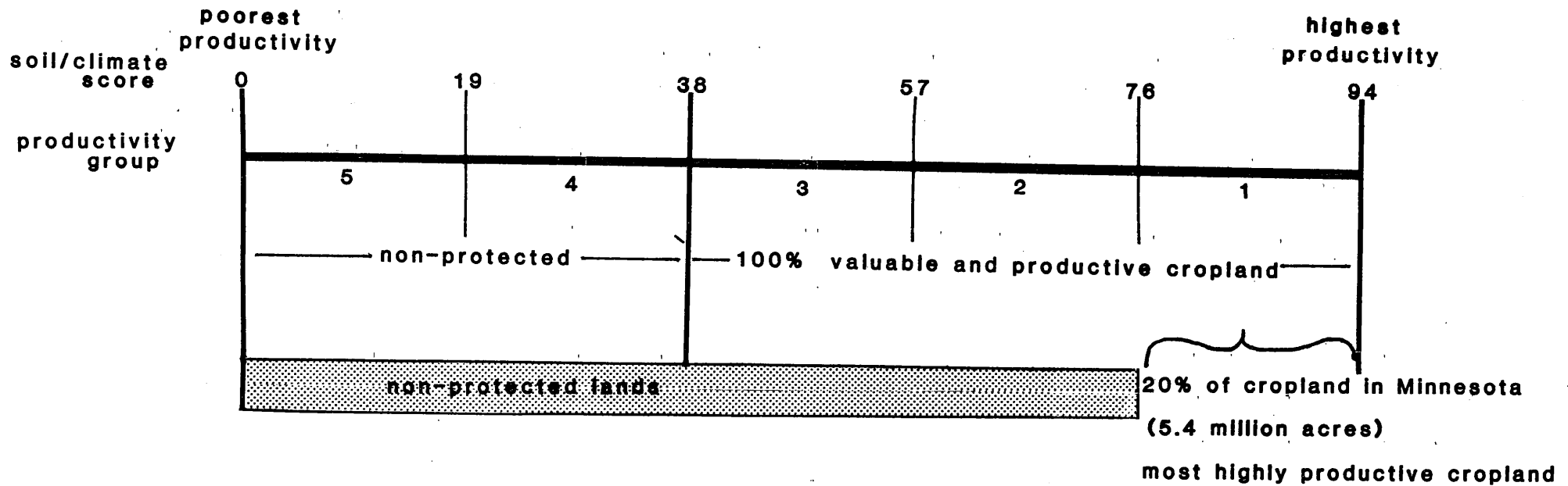
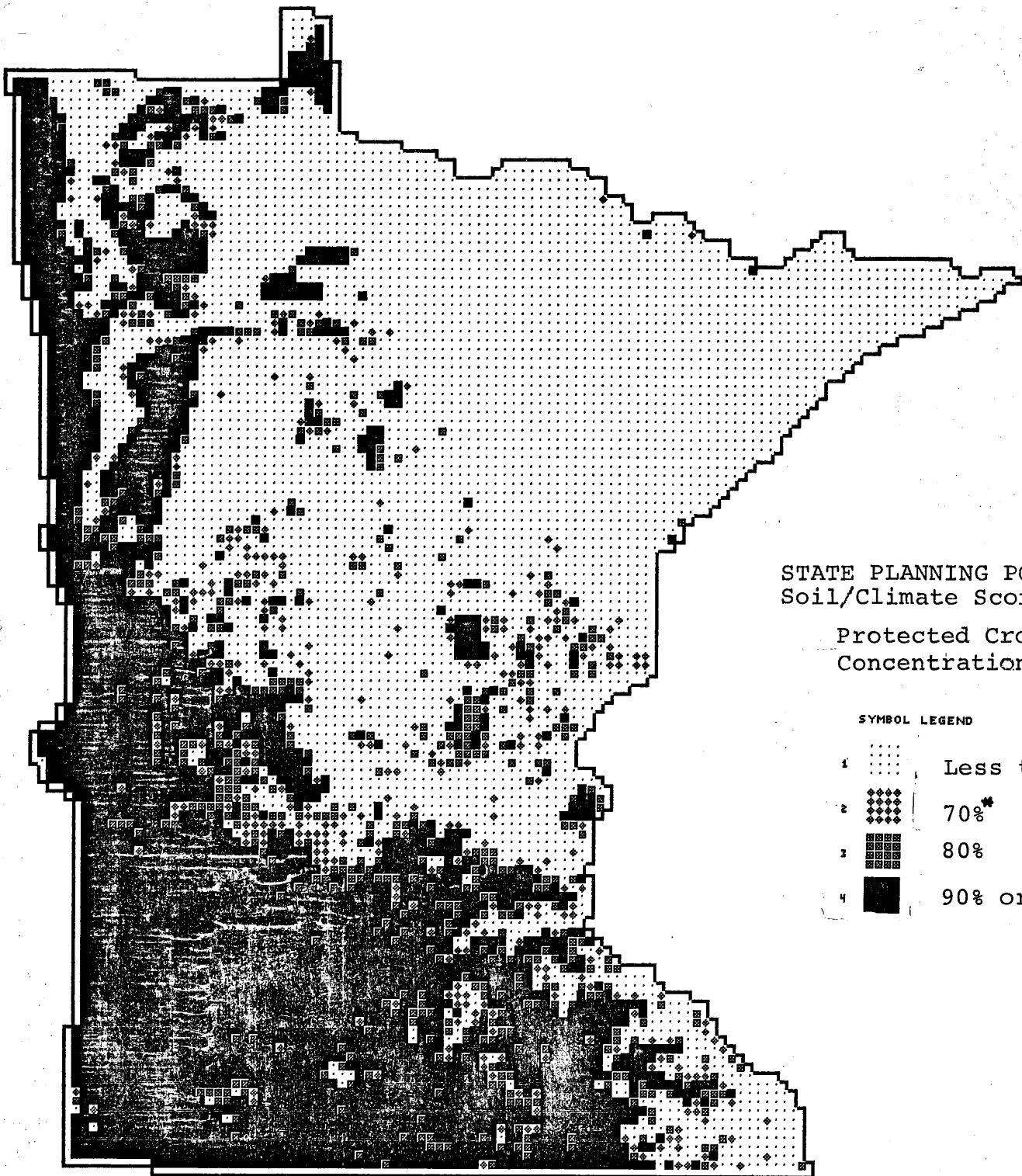


FIGURE 3



STATE PLANNING POLICY 100%
Soil/Climate Score 38

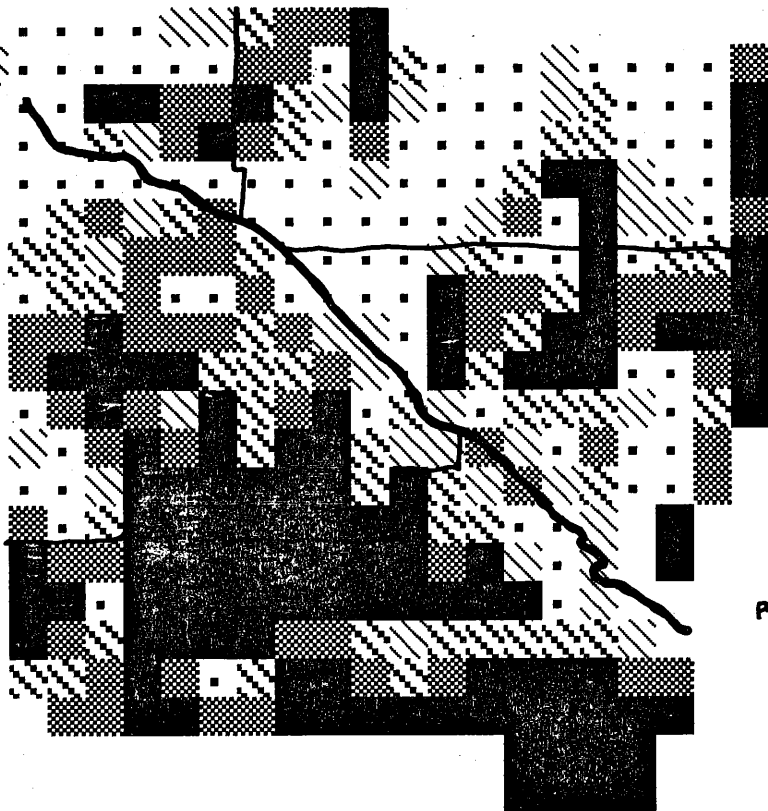
Protected Cropland
Concentration

SYMBOL LEGEND

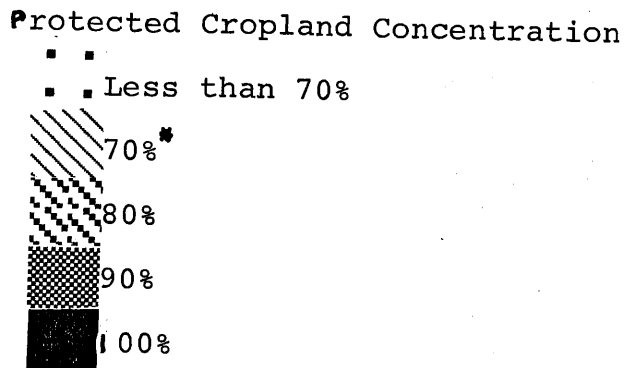
- | | | |
|---|-------|---------------|
| 1 | | Less than 70% |
| 2 | ◆◆◆◆ | 70%* |
| 3 | ■ | 80% |
| 4 | ■ | 90% or more |

*Note: the 70% concentration would result in the protection of the most land and reflects the cumulative addition of the 90%-80%-70% policies.

FIGURE 4



UPPER MINNESOTA VALLEY R.D.C.
 Region 6W Planning policy 70%
 Soil/Climate score 67



*Note: the 70% concentration would result in the protection of the most land and reflects the cumulative addition of the 100%-90%-80%-70% policies.

FIGURE 5

Upper Minnesota Valley R.D.C. Region 6W Planning Policy-70%

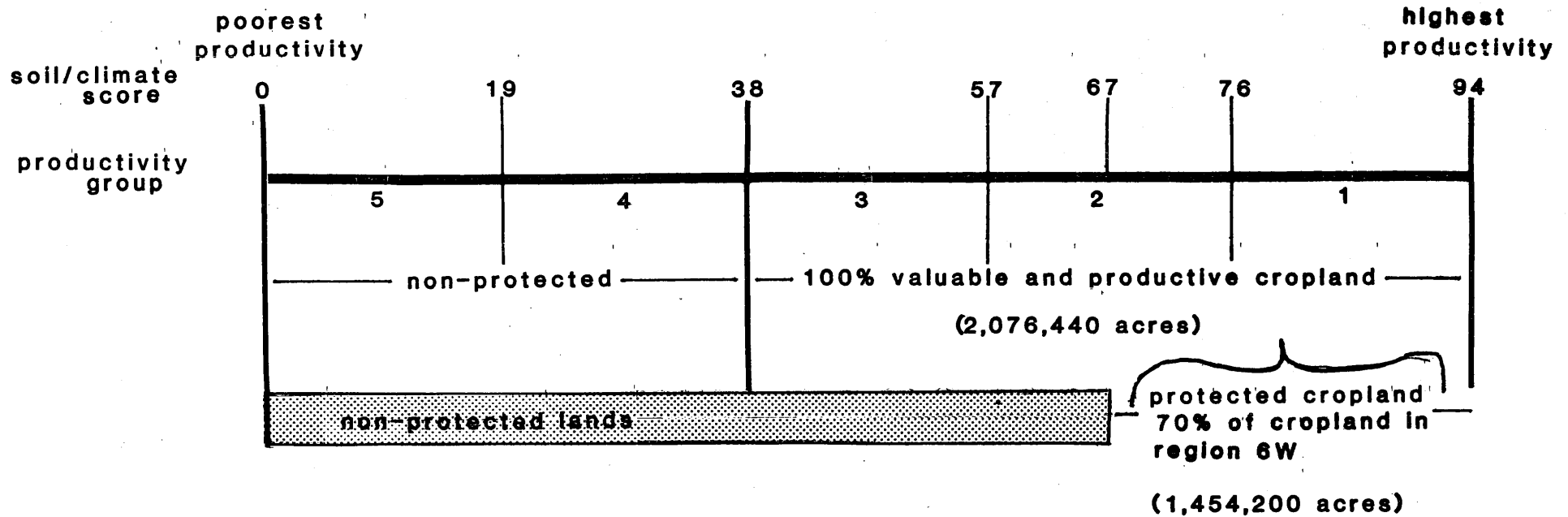
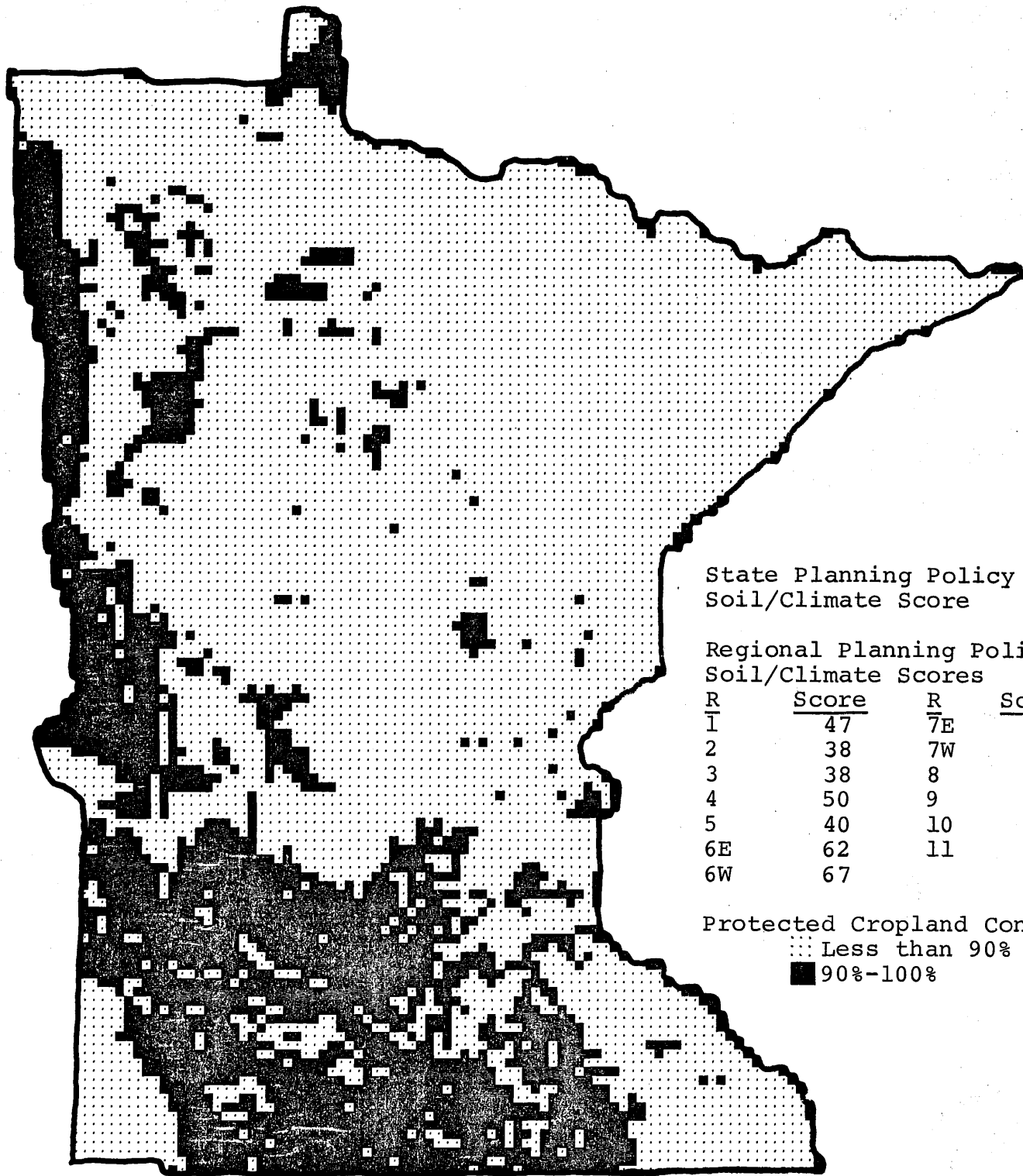


FIGURE 6



State Planning Policy 50%
 Soil/Climate Score 60

Regional Planning Policy 70%
 Soil/Climate Scores

R	Score	R	Score
1	47	7E	41
2	38	7W	51
3	38	8	61
4	50	9	77
5	40	10	64
6E	62	11	57
6W	67		

Protected Cropland Concentration
 ☐ Less than 90%
 ■ 90%-100%

FIGURE 7

Gaylin DenOuden

District 21B
Kandiyohi-Renville-Redwood-
Yellow Medicine Counties

Committees:

Appropriations
(Health, Welfare & Corrections Division)
Environment & Natural Resources
Transportation



**Minnesota
House of
Representatives**

October 31, 1979

Mr. Arthur Sidner
Minnesota State Planning Agency
101 Capitol Square Bldg.
St. Paul, MN 55155

Dear Mr. Sidner:

Some time ago it was made aware to your office that there was legislation introduced which would protect prime agricultural lands from having power plants built on them. This legislation was not pushed by me as a House author and neither by its Senate author because we were under the understanding that this same goal could be accomplished within the State Planning Agency in changes of rules within your administration rather than through the legislative process.

Some time has passed since this introduction as well as an urging from some of my constituents who are members of the Circuit Breakers, Inc.

Since the legislative session is coming up within the next couple of months, it is my intention that unless something seems to be moving within the State Planning Agency, I will aggressively seek a hearing and passage of this legislation.

Your assistance and reply relative to your intentions would be much appreciated by me so I will know whether and what the State Planning Agency is currently doing in this area.

Sincerely,

A handwritten signature in cursive script that reads "Gaylin Den Ouden".

GAYLIN DEN OUDEN
State Representative

GDO/mcm

cc: Mr. Charles Dayton
Attorney at Law
800 Midland Bank Bldg.
Mpls., MN 55401



~~Dayton, Herman, Graham & Getts~~ attorneys at law

300 Midland Bank Building
Minneapolis MN 55401
(612) 339-7633

October 17, 1979

Charles K. Dayton
John H. Herman
Kathleen M. Graham
Philip W. Getts
James A. Payne
Carolyn Chalmers

Mr. Arthur Sidner, Director
State Planning Agency
Capitol Square Building
St. Paul, MN 55101

Dear Mr. Sidner:

Thank you for giving me the opportunity to meet with you on October 16th to discuss the problems of power plant siting and the preservation of agricultural land.

I have checked with Mr. Doug Blomgren, and he indicates that he does not see any legal impediments to a regulation which would protect prime agriculture lands from the siting of power plants, assuming that the regulations is based upon agriculture productivity and a demonstrated need to preserve the best land.

We feel quite strongly that the time is ripe for the Agency to move forward with rulemaking proceedings to protect valuable and productive agricultural land from unnecessary encroachment by electric power facilities. The following is a quote from the testimony delivered by Mr. Jaisle to the House Committee on Environment and Natural Resources on February 8, 1979. It indicates that eleven (11) citizen workshops were held throughout the state involving nearly 300 citizens who have been consulted about the issue. Also the power plant siting advisory committee has devoted considerable study to agricultural land preservation. As you know, we were promised in March of 1978 that the Agency was moving forward in this area. Mr. Jaisle informed the legislature in February, 1979, that the Agency

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was developing draft rules on agricultural land for the inventory and in addition, "a companion rule establishing site selection criteria useful in protecting agricultural land in a case-by-case siting determination." It is the latter in which we are most interested. Unfortunately, following Mr. Jaisle's hopeful presentation to the legislature, the matter appears to have been placed on the back burner. Mr. Jaisle's testimony was in part as follows:

For some time there has been the suggestion that power plants should be excluded from certain classes of agricultural land. The most widely referenced classification is that of the U.S. Department of Agriculture's Soil Conservation Service (SCS). An important complication is that SCS soil surveys classifying agricultural land are available for only a few Minnesota counties. Therefore, statewide rules to establish the inventory of power plant study areas cannot rely on the SCS classification system.

Fortunately, the State Planning Agency is just completing an agricultural suitability survey which can be used for identification of valuable and productive agricultural land. The staff is developing rules for protecting valuable and productive agricultural land on a statewide basis by using the agricultural suitability survey.

Our approach is intended to incorporate soil type, climate and irrigation factors. Including such protection in the inventory of study areas can be very effective at a very early stage in guiding the location of power plants to areas of marginal land. It can also address the level at which "valuable and productive agricultural land" is defined. In the draft inventory report, several options for rules will be presented for broad public discussion. A critical set of options concern whether the rules should provide preference to: (a) the best agricultural land in each county; (b) the best in each region; or (c) the best on a statewide basis. I suspect there will be differences of opinion depending on the agricultural region of the state.

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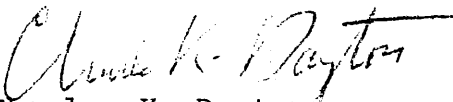
While developing inventory draft rules on agricultural land, it became clear that it might be desirable to also have a companion rule establishing site selection criteria useful in protecting agricultural land in case-by-case siting determinations. Our current thinking is to establish a maximum acreage of SCS Class I and II agricultural land that could be used for the developed portion of a power plant site and also a maximum acreage for a cooling water reservoir. Complete and absolute exclusion of all SCS Class I and II agricultural land could well prove to be an unworkable approach with unexpected consequences. The agricultural regions of Minnesota do, in fact, account for considerable electric power consumption. There must be the ability to site power plants in these regions to serve their electrical needs or long high voltage transmission lines will be required to deliver the necessary power from sites outside the agricultural regions. Such transmission lines would undoubtedly have to cross agricultural land. (Emphasis supplied.)

Clearly, the subject has received considerable study and the data is available to accomplish a workable and just rule. We have no need for further workshops. Accordingly, we request that the Agency proceed with formal rulemaking proceedings, perhaps preceded by an invitation for comments in the State Register, in order to establish an amendment to the power plant siting regulations which would classify prime agricultural land, Class I and Class II, as avoidance areas. These areas would not be used for power plants where feasible and prudent alternatives are available. If formal rulemaking proceedings are to be held on the power plant siting inventory, which is the case according to Mr. Blomgren, the rule change which we proposed could be considered at the same time.

Thank you again for your interest. We look forward to working with you.

Yours very truly,

DAYTON, HERMAN, GRAHAM & GETTS


Charles K. Dayton

CKD/mkh

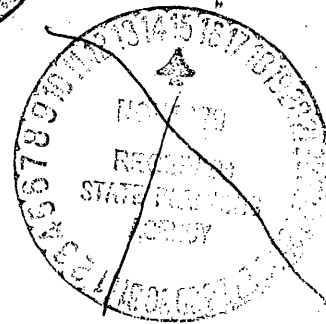
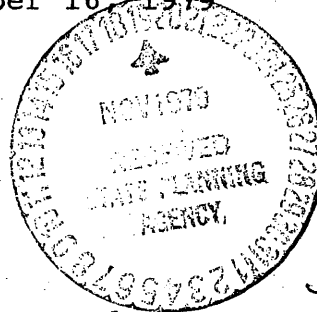
cc: Paul Ims

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Charles K. Dayton
John H. Herman
Kathleen M. Graham
Philip W. Getts
James A. Payne
Carolyn Chalmers

November 16, 1979



Mr. Arthur E. Sidner
Chairman
Minnesota Environmental Quality Board
100 State Capitol Square Building
550 Cedar Street
St. Paul, MN 55101

Re: Power Plant Siting Public Hearing
November 17, 1979

Dear Mr. Sidner:

We represent Circuit Breakers, Inc. and Concerned Citizens for the Preservation of the Environment, Inc., two citizens groups located in agricultural areas in southwestern Minnesota. We are submitting this written statement in response to your invitation to appear and testify at the annual public hearing on the power plant siting program, and your request for comments on how the siting process might be improved to better recognize social and community needs and to encourage more efficient use of all our resources.

RECOMMENDATION: The main concern of our clients is the preservation of prime agricultural land from unnecessary development, or from development which could be constructed on less valuable farmland. This is a subject for which the data are abundant and one which has been under consideration by the Agency for several years. It is our recommendation that the Agency formally propose a rule as a part of its Chapter 15 hearings concerning the power plant siting inventory which would prevent the use of prime agricultural land for power generating facilities, unless there is no feasible and prudent alternative site.

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We are pleased to see that the draft power plant siting inventory, in the section relating to agricultural lands, proposes to utilize the MLMIS 5 kilometer data file on highly productive cropland in Minnesota for the location of study areas. However, the criteria used in finding those study areas is too restrictive to be of much assistance in preservation of prime agricultural land. Only the top 20% of all cropland would be excluded from study, and then only if the 5 kilometer cell contained more than 75% of such land. Since cropland which is not in the top 20% of the productivity rating in the state is nevertheless highly productive land, the suggested criteria is too restrictive to be of much value as a siting tool.

NEED FOR A RULE. As the power plant siting inventory demonstrates, more than 500,000 acres of land in farms will be withdrawn from the agricultural base in the next ten years. In the "Notebook of Land Use Projections" prepared by the Environmental Planning Division of the State Planning Agency in June, 1958, it is noted that by the year 1990, our total need for harvested croplands will begin to approach the limits of available cropland in the state. Such a high utilization of cropland will, of course, require increasing amounts of fertilizer and putting marginally productive land into cultivation. Much of the land required to be put into cultivation may be forested land or land that is valuable as wildlife habitat.

The amount of land needed for new power plants in this century in Minnesota is of course difficult to predict but estimates range between 10,000 and 40,000 acres. Since we will be approaching the limits of agricultural production in about ten years, this amount of acreage is significant. Moreover, the proposed rule would be a first step in the recognition of soil productivity as a principal criteria in land planning.

The U.S. Soil Conservation Service 1975 report indicated that the loss of rural land has been occurring at a greater rate than had earlier been estimated. Between 1967 and 1975, about 3,000,000 acres a year of rural land had passed into urban use or been covered with water. Of the 250,000,000 acres of "prime agricultural land," a total of 7.4 million acres had been converted or inundated during that 8-year

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period. Land and Food, The Preservation of U.S. Farmland, American Land Forum Report/1, Spring 1979.

DETAILS OF A SITE SPECIFIC RULE: Of course, the precise nature of a rule to protect prime agricultural land from power plant siting should be the subject of formal rulemaking hearings and need not be determined finally at this time. We propose that the Agency's draft rule utilize the classification of Soil Conservation Service, U.S. Department of Agriculture, 7 C.F.R. Part 657. Those criteria are widely used and understood. They have been endorsed by the administrator of the United States Environmental Protection Agency in his policy statement of September 8, 1978 on the protection of agricultural lands. While not all of Minnesota counties have been completely classified under this system, the SCS classification would be utilized only for a "site specific" criteria, and not for the definition of study areas. Therefore, particular sites under consideration can be the subject of a soils survey, without the necessity of surveying an entire region or county before decisions can be made.

Perhaps some other more workable criteria will emerge as a part of the rulemaking process. The important thing is to start soon.

LEGISLATIVE AND AGENCY SUPPORT FOR PRESERVATION OF PRIME LAND: Statements by various representatives of the State Planning Agency and the MEQC indicate support for state action to preserve prime agricultural land. However, no action has been forthcoming. Mr. John Mohr, testifying before a joint senate subcommittee on agricultural land preservation, on January 10, 1978, stated that the State Planning Agency strongly supports efforts to set forth goals, including the goal of permanently preserving certain parcels of agricultural land and open space from conversion to other uses. He suggested that emphasis should be directed toward control of land, not optimizing production, by minimizing loss of high quality cropland in guiding growth to poorer land. Subsequently, the legislature did enact a statute in 1979, establishing a joint legislative committee on agricultural and forest land preservation. The Act declares it to be the "policy of the state to assure that Minnesota lands that are well suited for the production of agriculture and forest products be used and managed primarily

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for those purposes by: . . . permanently preserving certain parcels of prime agricultural and open space land from conversion to other uses."

Mr. John Hynes of the power plant siting staff in February of 1979 prepared a memorandum which suggested a site selection criteria of the type which we recommend. Mr. Allen Jaisle, in his February 8, 1979 statement to the House Committee on Environment and Natural Resources, noted that the staff was in the process of developing rules for protecting valuable and productive agricultural land on a statewide basis by using the agricultural suitability survey, and also suggested that it may be desirable to have a companion rule establishing a site selection criteria useful in protecting agricultural land on a case-by-case basis.

Our current thinking is to establish a maximum acreage of SCS Class I into agricultural land that could be used for the developed portion of a power plant site and also a maximum acreage for a cooling water reservoir.

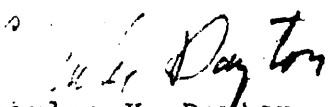
On November 3, 1977, Mr. Paul Ims, President of Concerned Citizens for the Preservation of the Environment, Inc. appeared at hearings before Myron Greenberg, State Hearing Examiner, concerning the proposed power plant siting regulations. Other citizens testified, as did Ims, that exclusionary criteria for power plant sitings should include Class I and II prime agricultural land. The hearing examiner, at page 79 of his report to the Agency, recommended that additional hearings be held on the subject, because of its importance. At the March 8, 1978 meeting of the EQB wherein the rules were adopted, we were assured by the then chairman that the Agency would move forward for the consideration of such a rule. Later, when legal questions concerning the authority of the Agency to promulgate such a rule were raised, the progress was stopped. It is now our understanding that the Agency's counsel is of the opinion that such a rule, if carefully drafted and based upon substantial evidence of need in the record, would be valid. If there is any doubt on this point, I will be pleased to submit a formal legal memorandum.

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CONCLUSION: As a part of its power plant siting inventory at Chapter 15 hearings, the Agency should propose a specific rule, excluding prime agricultural land of Class I and II as defined by the State Soil Conservation Service from use for power generating facilities, unless no feasible and prudent alternatives are available. While such facilities are only one of the many land consumptive uses, such a rule would establish a beneficial precedent leading to additional mechanisms for the preservation of valuable farmlands.

Yours very truly,

DAYTON, HERMAN, GRAHAM & GETTS


Charles K. Dayton

CKD/mkh

cc: Paul Ims
Myron Peterson
John Hynes
Allen Jaisle