



STATE OF MINNESOTA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF MINERALS

IN THE MATTER OF THE PROPOSED ADOPTION OF  
RULES FOR PEATLAND RECLAMATION

STATEMENT OF NEED AND REASONABLENESS

DECEMBER 3, 1984

STATEMENT OF NEED AND REASONABLENESS

TABLE OF CONTENTS

Introduction.....	page 1
General Provisions	
6131.0010 Definitions.....	5
6131.0020 Purpose and Policy.....	7
6131.0030 Scope.....	9
Peatland Reclamation Standards	
6131.0100 Siting.....	13
6131.0110 Mine Design.....	16
6131.0120 Site Restoration.....	20
6131.0130 Cleanup.....	26
Permit Requirements	
6131.0140 The Permit to Mine.....	27
6131.0150 Permit Applications.....	28
6131.0160 Annual Report.....	32
6131.0170 Plan for Deactivation.....	33
6131.0180 Request for Release.....	35
Procedures and Standards	
6131.0190 to 6131.0340.....	36
Small Business Considerations in the Rulemaking Process.....	37
Bibliography.....	44

## INTRODUCTION

Minnesota's peatlands are a product of an interaction among plants, topography, climate, and water. In wetland communities the lack of oxygen in the water-saturated environment limits the ability of microorganisms to digest dead plant material. As a result, plant material which ordinarily decomposes in an upland environment, accumulates faster than it can decay. This partially decomposed plant material is called peat.

Peatlands are valuable resources providing many uses including horticulture, agriculture, forestry, energy, industrial chemicals, recreation, scientific study and preservation, wildlife habitat, and water filtration. Minnesota contains approximately 7,000,000 acres of peatlands (approximately 50% of which are state-owned or administered). These occur throughout Minnesota except in the extreme southwestern and southeastern corners of the state. The largest contiguous areas of peatland occur in the northern part of the state in St. Louis, Koochiching, Beltrami, Lake of the Woods, Aitkin, Itasca, and Roseau counties.

Peat has been mined in Minnesota for use by horticultural industries for more than 20 years. Horticultural peat is usually composed of moss plant material. It is primarily used as a soil amendment by homeowners, nurseries, greenhouses, and landscape gardeners. Horticultural peat is also used in potting soils, growing mixtures, and as a medium for growing mushrooms and worms. Another potential use for Minnesota peat is as an energy source. Energy peat is typically composed of reed-sedge plant material. Peat has been used for energy extensively in Europe and is now being evaluated in Minnesota.

In Minnesota approximately 1,500 acres of peatland are currently under production for horticultural (950 acres) and energy (530 acres) purposes. An

additional 6,600 acres (2,800 horticulture and 3,800 energy) of peatlands are contemplated for development by existing peat producers in the state.

A peat mining operation may disturb large areas through removal of vegetation, ditching, and the subsequent mining and processing of the peat. The hydrology of large areas is thus disrupted and land surfaces are exposed to water and wind erosion. Upon termination of mining, vast areas of land could remain with little or no vegetative cover. In order to minimize the environmental impacts associated with peat mining as well as to provide for the ultimate reclamation of mined areas, the legislature authorized the DNR to promulgate rules for the mining and reclamation of peatlands.

Minnesota Statutes, sections 93.44 - 93.51 (1982 and Supp. 1983), entitled the Mineland Reclamation Act, direct the Commissioner of Natural Resources to adopt rules providing for the reclamation of lands disturbed by the mining of metallic minerals and peat. The law declares that it is the policy of the state, through mineland reclamation, to control the adverse environmental effects of mining, to preserve natural resources, and to encourage land use planning. The law further declares as policy the promotion of the orderly development of mining, the encouragement of good mining practices, and the recognition and identification of the beneficial aspects of mining (Minnesota Statutes, section 93.44 (Supp. 1983)).

The Mineland Reclamation Act was originally passed in 1969 and was the legislative response to Minnesota's nearly 100 year old iron mining industry (Laws 1969, chapter 744). Because natural iron ore and taconite ore mining have had an enormous economic, social, and environmental impact on the state,

the original act was directed strictly to metallic minerals. Rules relating to the reclamation of iron and taconite mining areas were subsequently promulgated.

In 1983 the Mineland Reclamation Act was amended to include provisions for the reclamation of lands affected by peat mining and directing the Commissioner of Natural Resources to promulgate rules therefor (Laws 1983, chapter 270). As a result of the 1983 amendment, these rules, relating solely to the mining of peat, have been developed. Because the act requires the rules to be prospective in nature, they will apply only to those portions of mining operations conducted subsequent to the date of promulgation.

The Mineland Reclamation Act also directs the Commissioner of Natural Resources to conduct a study and survey to determine the extent to which regulation of peat mining is necessary to protect the interest of the general public. The DNR has gathered information on peat mining operations in Minnesota, Michigan, Maine, South Carolina, Canada, Sweden, Finland, and Ireland. From this study and survey, it was determined that:

- (1) Peat mining can result in the disturbance of large land areas.
- (2) In North America some abandoned peat mining areas do not support vegetative cover or provide for a subsequent land use.
- (3) Reclamation is a common practice in European countries where peat has been mined for many decades.
- (4) Peatland reclamation in European countries is most often achieved through agricultural methods or by reforestation; both require post-mining management.
- (5) Not all the existing operators in Minnesota have plans for the reclamation of their mining areas.

Peat mining in Minnesota, to date, has not resulted in substantial environmental impacts. However, given the interest shown by existing and potential peat operators, it is possible that peat mining in Minnesota will proceed on a substantially larger scale than in the past. Based upon the potential for a significant increase in the acreage of peatlands opened for mining and upon the legislative mandate to promulgate rules, the department has prepared these rules for the reclamation of mined peatlands.

## GENERAL PROVISIONS

## 6131.0010 DEFINITIONS.

This section contains two types of definitions; those terms that appear and are defined in Minnesota Statutes, sections 93.44 - 93.51, and those terms that are used in the proposed rules which may not be generally recognized and accepted, and to which special and specific meanings are attached for the purposes of the rules.

Subpart 1. "Auxiliary facilities" is defined to include every alteration to the natural environment associated with the mining operation because all such areas should be subject to reclamation. Common carrier facilities are excluded because their usefulness is not related to only a single mining operation nor will they necessarily terminate operations upon termination of the permit to mine.

Subpart 2. "Beneficiating plants" is defined in order to clarify that the applicability of these rules extends to processing and fabricating facilities located in the state, and because the term is included in the definition of "mining area".

Subpart 3. "Commissioner" is defined in Minnesota Statutes, section 93.46, subdivision 8.

Subpart 4. "Deactivation" is defined because it represents the final stage of reclamation.

Subpart 5. "Hereafter" is defined to explain the point at which the proposed

rules become effective and to assist the commissioner in identifying those portions of a mining operation to which the rules apply.

Subpart 6. "Mine plot" is defined because it represents a particular type of land within the "mining area" and it is used to define the upper size limit for which a permit will be issued.

Subpart 7. "Mining area" or "area subjected to mining" are defined in Minnesota Statutes, section 93.46, subdivision 2.

Subpart 8. "Natural Resources" is defined in Minnesota Statutes, section 116B. 02, subdivision 4 (1982).

Subpart 9. "Operating life of the mine" is defined to clarify the term for which a permit will be issued. It is consistent with Minnesota Statutes, section 93.481, subdivision 3 (1982).

Subpart 10. "Operator" is defined in Minnesota Statutes, section 93.46, subdivision 6.

Subpart 11. "Peat" is defined to specifically identify the resource which the rules address.

Subpart 12. "Peat mining" is defined in Minnesota Statutes, section 93.461 (a).



Subpart 13. "Permit to mine" or "mining permit" is defined because it describes the legal instrument that prescribes the terms and conditions under which a mining operation may be conducted, and constitutes the authorization by the commissioner to conduct such a mining operation.

Subpart 14. "Progressive reclamation" is defined because it identifies a standard of success by which reclamation processes and scheduling will be evaluated.

Subpart 15. "Protected waters" is defined because the term has specific meaning according to the statute cited in the rules.

Subpart 16. "Reclamation" is defined because it provides the basis for determining the degree to which the terms and conditions of the permit to mine have been met.

Subpart 17. "Stockpile" is defined because it is used in a specific manner which might be misunderstood if not defined.

#### 6131.0020 PURPOSE AND POLICY.

The first paragraph of this section cites the enacting legislation for these proposed rules, and contains a number of policy statements on which the rules are based. These policy statements consist of recitation and amplification of state policy as declared in the statute.

The second paragraph of this section acknowledges the limited information available regarding the ability to reclaim large contiguous areas of mined

peatlands. The legislative direction to prepare these rules was basically a response to peat mining proposals made during the mid 1970's. These proposals, had they been implemented, would have led to the development of extremely large acreages of peat, up to 200,000 acres in the case of one proposed operation. The large-scale mining proposals of the mid 1970's were not implemented and at present their immediate implementation appears unlikely. Therefore, these rules have been directed toward peat mining operations anticipated to exist in the near future in Minnesota. Based on past experience it is reasonable to assume that large-scale mining proposals might again be made. This portion of the rules is intended to alert future developers of large-scale peat mining operations that additional information will be necessary before these rules can be directly applied, or amended so as to apply, to their mining proposals.

The third paragraph of the purpose and policy section expresses the department's conclusion that reclamation of mined peatlands can best be achieved by developing permitting standards on a site specific basis. Each peatland contains unique characteristics that will influence its development and subsequent reclamation. Such characteristics include the type of peat, depth of peat, surface and groundwater regime and surrounding land uses.

The variety of mining methods available will also greatly affect the reclamation options for a mined peatland. For example, it is likely that a wet mining method will result in a final landform dominated by open water areas. Such an area would be suited to a wildlife habitat reclamation option. On the other hand, a milled peat area may be successfully maintained in either a wet or dry post-mining condition and be a candidate for wildlife, farming or forestry reclamation options.

Because of the extreme diversity in peatlands and mining methods available, it is reasonable that specific reclamation permitting conditions are developed on a site specific basis. To facilitate this approach, the rules establish a framework within which reclamation permits can be developed. These broad guidelines afford the flexibility necessary to accommodate the needs of specific mine sites and mining methods. The terms of individual permits to mine will detail specific reclamation requirements that will ensure the accomplishment of the reclamation plan. These permit requirements will remain unchanged during the life of the operation unless amendments are proposed by the permittee and granted by the commissioner.

6131.0030 SCOPE.

Subpart 1. This section is a recitation of Minnesota Statutes, section 93.461 (c), defining the levels of peat production that are outside the scope of these rules. Ambiguities in the statutory language were clarified by establishing that only after an operation reached 40 acres would a permit be required. This adds clarity to the intent that peat mining operations less than 40 acres in size should be excluded from the rules.

Subpart 2. Minnesota Statutes, section 93.461 (b) provides that no permit to mine is required of a person mining peat until 180 days following promulgation of these rules. Minnesota Statutes, section 93.481, subdivision 1 provides that existing mining operations may continue during the pendency of the application for the permit to mine.

Subpart 3. Minnesota Statutes, section 93.481, subdivision 1 requires that no person shall carry out a new mining operation or reactivate an inactive mining operation until receiving a permit to mine.

Subpart 4. Minnesota Statutes, section 93.47, subdivision 3 requires the commissioner to identify areas that cannot be reclaimed in a satisfactory manner by existing technology. The department established the Peat Program in 1976 to study Minnesota's peat resources and predict the impacts that might result if they were mined. One of the recommendations in the "Minnesota Peat Program Final Report" (Minnesota Department of Natural Resources, 1981, page 86) was the development of guidelines relating to the maximum size for peat leases on state lands. The recommended size limit was 3,000 acres, recognizing that "Leases for larger-scale development should not be granted until the technological, economic, and environmental feasibility is well documented both conceptually and by demonstration." This size limit of 3,000 acres was, according to the report, partially based on "...Extensive water quality and quantity monitoring and vegetation and wildlife studies..." which "...suggest that environmental impacts of mining and other uses may be successfully mitigated on lease tracts of this size." The report also concludes that economically viable mining operations can be conducted within this 3,000 acre limit, and gives examples of the European experience which substantiates this determination. Since the 3,000 acre limit was based on environmental considerations, it is reasonable to extend this limit to all lands regardless of ownership.

To gain more information on mine plot size, site visits were made to peat mining areas around the world during the summer of 1984. Inspection tours in

Canada, Finland, Sweden, Ireland, and the U.S. revealed that most operations were much less than 3,000 acres in size, and none approached the 200,000 acre size proposed for a Minnesota operation during the mid 1970's.

A survey conducted during 1984 revealed that environmental impacts associated with peat mining appear minor although the long term impacts of large-scale mining have not been quantified. Both the site visits and survey results further support the 3,000 acre size restriction.

Subpart 5. This section is a recitation of Minnesota Statutes, section 93.481, subdivision 3 which states that the term of a permit to mine shall be for the period determined necessary by the commissioner to complete the proposed mining operation. To aid the commissioner in this determination, information provided in the permit application must be utilized.

Subpart 6. Minnesota Statutes, section 93.47, subdivision 3 extends these rules to those portions of an operation conducted subsequent to the promulgation of the rules. This subpart clarifies that all portions of new operations, and any part of existing operations which might be used or created after promulgation shall comply with the rules. This subpart acknowledges that some portions of existing operations might be in violation of the siting section of the rules, and concludes that it would be unreasonable to resite such portions.

Subpart 7. Rules, statutes, and ordinances combine to make up the body of law applicable to peat mining. The commissioner neither intends nor has the authority to prevent the enforcement of laws which are applicable or which are

more restrictive in a specific instance. As a matter of law, these rules apply regardless of the existence of a less stringent standard adopted by another unit of government.

Subpart 8. This is a recitation of a portion of Minnesota Statutes, section 93.47, subdivision 3 and relates to authorization from various governmental entities which may be in existence prior to the issuance of a permit to mine. It is included to provide a complete understanding of how these rules relate to authorization already obtained by the operator.

## PEATLAND RECLAMATION STANDARDS

## 6131.0100 SITING.

The fundamental purpose for adopting rules relating to the siting of mining operations is that peat mining operations may be large facilities which use considerable quantities of land very intensively. Accordingly, the potential for land use conflicts between mining areas and adjacent lands is significant. The types of impacts and disturbances associated with peat mining are, for the most part, inconsistent with residential, wilderness, and most types of recreational uses. The potential for land use conflict is amplified by the facts that: 1) The peat resource yet to be mined is enormous; 2) New mining operations may require new employees, possibly attracting greater populations to the mining regions; and 3) Peat mining is carried out in a part of Minnesota which is generally popular as a recreational region. The rules relating to siting are an attempt to avoid future land use conflicts between mining operations and adjacent areas.

Subpart 1., the goal statement, merely recognizes that conflicts between mining areas and adjacent non-compatible land uses should be avoided through proper siting of facilities. It is reasonable to avoid such conflicts.

Subpart 2., "Requirements; exclusion areas for mining", contains a description of areas in which no peat mining shall be conducted, except under the circumstance of a state or national emergency. Peat mining is prohibited in these exclusion areas because, in the case of formally designated areas, such mining would diminish and possibly destroy the very qualities which caused these areas to be designated in the first place. Moreover, the law directs the commissioner to identify areas or types of areas which cannot be satisfactorily reclaimed under the rules, and further, prohibits the commissioner

from issuing permits to mine such unreclaimable areas. The areas designated as exclusion areas represent areas which, through the determination of the commissioner, cannot be satisfactorily reclaimed.

The areas listed in subpart 2., items A. to G. were established through formal actions at the state or federal level, so their designation is significant and their protection therefore is important. The setbacks listed are taken from existing DNR policy.

Subpart 2. H. provides for a minimal separation of mining operations and certain adjacent land uses which involve the presence of people. These separations serve to protect the public health and safety and to prevent individuals from unknowingly traveling onto possibly hazardous mining properties. In addition, the separations provide a buffer between inconsistent land uses, thereby diminishing the intrusion of the effects of mining onto adjacent lands. Such separations are consistent with those found in zoning ordinances, and are reasonable to adopt.

Subpart 2. I. simply acknowledges that areas which merit special consideration that are not currently recognized may in the future be added as exclusion areas for mining. This is reasonable, in that over time, conditions can change, requiring new or modified land management techniques and objectives.

Subpart 3., "Requirements; avoidance areas for mining", contains a description of areas in which mining is prohibited, except in two cases. The first case is where peat mining will enhance the existing use of an area. For example, peat mining on a small-scale may be an effective management tool within a



wildlife refuge and it is reasonable that peat mining should be allowed in such a case. The second case is where no reasonable or prudent alternative exists. If such a situation arises on state-owned lands, it is reasonable that the affected area be replaced in kind.

In subpart 3. A., lands within the boundaries of Peatland Protection Management Areas are listed as avoidance areas for mining. Peatland Protection Management Areas contain the core areas and watershed protection areas of the ecologically significant peatlands described in "Recommendations for the Protection of Ecologically Significant Peatlands in Minnesota" (Minnesota Department of Natural Resources, under preparation).

Identification and evaluation of the state's ecologically significant peatlands greater than 3,000 acres began in 1978 as part of the DNR's Peat Program. In 1981, 22 peatland complexes were identified as candidate areas for protection. Legislation passed in 1983 (Laws of Minnesota 1983, chapter 301, section 22) directed the department to review the information compiled on these 22 candidate peatlands and make recommendations regarding their protection. The publication, "Preliminary Report on Protection of Ecologically Significant Peatlands in Minnesota" (Minnesota Department of Natural Resources, June 1984) was a summary of the information compiled through June 1984 about these peatlands. The final report entitled "Recommendations for the Protection of Ecologically Significant Peatlands in Minnesota" will be used to draft peatland protection legislation for the 1985 legislative session. Promulgation of the peatland reclamation rules will be completed before a final legislative decision is reached on the protection of the ecologically significant peatlands in Minnesota. If such legislation

affords these areas more protection than do these rules, then the law will supercede these rules.

The rationale for protecting the areas listed in subpart 3. B. to E. is basically resource value, however, the prohibition of peat mining within these areas is not absolute. It is reasonable to avoid disturbing areas which have been specifically designated or are generally recognized, on the basis of their high natural resource value, as areas deserving protection and special management, when reasonable alternatives to using such areas exist.

#### 6131.0110 MINE DESIGN.

Subpart 1. A peat mining operation results in a substantial disturbance of the physical environment through the removal and movement of large quantities of materials. Land disturbances of this magnitude have great potential for environmental impacts and land use conflicts. These activities can significantly disrupt the surface hydrology and drainage patterns of the mining area. Erodable surfaces are exposed, leading to both wind and water erosion. The terrain is drastically modified, creating land and water forms uncharacteristic of the premining conditions.

The purpose of the mine design standards, as reflected in the goal statement in subpart 1., is to minimize this potential degradation and to prescribe certain standards which will facilitate effective reclamation of the mining area.

Subpart 2. A. In order that the commissioner has a clear understanding of how

and when reclamation will be achieved, knowledge of how mining is expected to proceed is essential. The manner in which mining will be conducted will have a significant impact on the success of the reclamation plan. Therefore, it is reasonable that mine designs be reviewed and approved prior to their implementation. The following items contained in subpart 2. A. (1) to (3) address mine design criteria that relates to efficient reclamation of the mining area.

Subpart 2. A. (1). In some instances it may be possible to develop a mine in a series of mine plots, each having a relatively short operating life. In other cases the entire mining area may remain open throughout the life of the operation, in order to efficiently remove the resource. Wherever possible, the development of mining in a series of plots is encouraged. Mining in this manner makes areas available for reclamation earlier and more continuously throughout the life of the operation, thus reducing the magnitude of reclamation required when mining ceases.

Subpart 2. A. (2). When mining can be conducted by utilizing a series of plots, it is reasonable to schedule activities in a manner which allows progressive reclamation. Progressive reclamation is simply the initiation of reclamation practices on an area as soon as resource removal has been completed. Where the area can be mined in a series of mine plots, progressive reclamation will encourage early and continuous reclamation resulting in the prompt and continuous conversion to the approved post-mining use.

Subpart 2. A. (3). Because of the high water tables characteristic of peatlands, it is likely that some portions of a mining area will eventually be covered with water. It is reasonable that mining areas be designed so that

such water bodies will be stable and not fluctuate significantly in size and depth. Such fluctuations could be detrimental to the development of a protective vegetative cover and the establishment of approved post-mining uses.

Subpart 2. B. It is necessary that adjacent peat mining operations do not exceed, in size, an area which is too large to be reclaimed or otherwise represents a significant environmental hazard. Because of the diversity in the kinds of operations and the types of peatlands which might be involved, the need for and extent of separations will be evaluated on a site specific basis. To aid the commissioner in making a determination, site related criteria itemized in subpart 2. B. (1) to (5) will be utilized.

Subpart 2. B. (1). It is reasonable that mine plot sizes be considered since it is the cumulative size of these areas which must be evaluated to determine if undesirable impacts would result. In general, it is more difficult to reclaim large drastically disturbed areas than small ones.

Subpart 2. B. (2). It is reasonable to consider the success of a separation in mitigating impacts since this is its intended function.

Subpart 2. B. (3). It is reasonable to consider the proposed reclamation plan for the mining area since this may affect the need for or extent of separations. Separations may also provide a seed source to abandoned mine plots which could facilitate natural revegetation.

Subpart 2. B. (4). It is reasonable to consider the economic impacts and the loss of potentially valuable peat resources associated with separations.

Minimizing the size of separations could reduce environmental disruption by limiting overall disturbance to fewer areas.

Subpart 2. B. (5). Ownership patterns may dictate that the only reasonably available lands for development are adjacent to existing or proposed operations. It is reasonable that decisions made regarding separations should recognize this fact.

Subpart 2. C. Many peat mining methods require dewatering of the mining area. Minnesota Statutes, section 93.47, subdivision 2 requires the commissioner to consider mining's effect on the environment, future utilization of the land, and protection of natural resources (including erosion control and prevention of bank slumping) in the formulation of the rules. Items listed in subpart 2. C. (1) to (3) are necessary and reasonable means of addressing these concerns.

Subpart 2. C. (1). If levels of protected waters were lowered, undesirable impacts on the waterbody and its ecosystem are likely to result. It is reasonable that the mine design ensure the maintenance of surrounding protected water levels.

Subpart 2. C. (2). Similarly, mine dewatering may change the characteristics and reduce the value of adjacent unmined peat resources. It is reasonable that the mine design address this problem and offer protection to adjacent undisturbed peatlands.

Subpart 2. C. (3). The requirement that ditches be constructed in a manner which avoids erosion and bank slumping is essential to protect the environment.

Subp. 2. D. Unlike metallic mineral mining which generates large quantities of waste material, peat mining generates only small quantities of waste by-products. Predominant among these are wood piles, mainly tree stumps and roots, and unusable peat. Wood waste material is generally windrowed within or adjacent to the mine plot. At one of the mining operations inspected during 1984, permanent disposal of this material was accomplished by burning. Peat wastes were observed at many sites. When generated by a dry mining method, this material was generally piled at the site. Under wet harvesting methods, peat wastes are often in the form of a slurry and are pumped into holding ponds. Holding ponds like those observed in Vancouver, British Columbia are intermittently saturated and dehydrated, supporting little or no vegetation. It is reasonable to require the proper disposal and reclamation of these types of mine wastes.

#### 6131.0120 SITE RESTORATION.

The restoration of peat mining areas serves two primary functions: (1) The prevention or reduction of adverse environmental impacts; and (2) the promotion of a subsequent land use. The goal statement contained in subpart 1. is an iteration of these functions.

The result of peat mining activities is the creation of landforms and disturbed areas devoid of vegetation. These unvegetated areas often result in wind and water erosion, both of which have been and occasionally continue to be observed in peat mining areas. Conditions similar to dust storms can periodically be observed on windy days in some peat mining areas. Airborne particulates can cause several environmental and public health problems.

While this phenomenon is often unavoidable during active operations, it should not be allowed to continue when operations on a particular mining area have ceased. Similarly, surfaces of slopes, such as ditchbanks and shorelines, are susceptible to water erosion, which can cause stream sedimentation and other water quality impacts downstream from the mining area. Site restoration is, in effect, the stabilization of such surfaces by vegetation or by other measures. Restoration reduces the vulnerability of a mining area to erosion and thereby prevents or diminishes environmental impacts.

Restoration further provides that an area will be available for higher land use options in the future. These include timber and biomass production, wildlife habitat, and agriculture. Restoration also enhances the aesthetic appeal of an area. This is particularly true in northern Minnesota, where unvegetated mining areas are generally in stark contrast to surrounding undisturbed areas.

After mining has ceased, the mining area can be reclaimed for a variety of land uses as described in subpart 2. A. These land uses are reasonable and should be available options for reclamation. However, the continued and long-term success of these land uses is dependent on the long-term management of the area by the landowner. For example, a forest plantation may require careful control of the water level during seedling establishment as well as periodic fertilization and thinning. Likewise, a wildlife impoundment may require occasional drawdown to oxidize organic sediments. It is obvious that such land uses require comprehensive management that extends beyond the period for which the operator should be liable.

Maintenance of existing ditches and water control structures is also of vital concern to the success of these land uses. An important factor in maintenance is that of beaver control. Beavers are ubiquitous throughout Minnesota peatlands and they are notorious for the extent of flooding that can result from their activity. If uncontrolled, beavers could destroy reclamation efforts in as little as one season.

Post-mining land uses like those discussed in subpart 2. A. are viable reclamation options that require varying degrees of post-mining management. It is reasonable that the operator and the landowner reach an agreement before operations begin as to the ultimate reclamation of the land, the reclamation responsibilities of both parties, and a post-mining management plan that ensures long-term success. If no agreement is reached between the operator and the landowner, the operator must comply with the requirements set forth in subpart 2. B.

When an agreement is reached between the operator and the landowner, the post-mining management plan is developed jointly and submitted with the application for the permit to mine. Subpart 2. A. (1) to (8) contains a list of considerations for developing the post-mining management plan. The list is necessary to give direction to the applicant as to the content of the plan. It is reasonable that the post-mining management plan be compatible with site restoration goals, adjacent uses, and local land use plans. It is also reasonable that the plan consider the needs of the area, the productivity of the site, and projected land use trends. Lastly, it is further reasonable to protect public health and safety and avoid pollution of air and water. These are points that should be considered during the preparation of the post-mining management plan.



Subpart 2. B. applies to operators who have no post-mining management plan with the landowner and to those portions of a mining operation that are not included in a post-mining management plan in subpart 2. A. Subpart 2. B. states that all surfaces disturbed during the mining operation shall be stabilized with vegetation to control erosion and to enhance the land use quality and capability of the area. The establishment of vegetation on these surfaces is the most effective means of accomplishing these ends in a maintenance-free, self-perpetuating, and permanent manner. The use of vegetation on these surfaces also results in the mining area being reclaimed in a manner which is compatible with the surrounding area. It is reasonable to require that such surfaces be stabilized with vegetation to curtail environmental impacts associated with unvegetated lands and to ensure continued use of the area.

Subpart 2. B. (1) specifies that revegetation procedures begin as soon as possible during the first planting period following the point when the area is no longer scheduled for use. It is reasonable to require that revegetation begin promptly after the cessation of mining for the following reasons. First, prompt revegetation will reduce environmental impacts that may result from large areas of exposed surface. Such impacts may include air pollution from fugitive dust.

Second, prompt revegetation is consistent with the concept of progressive reclamation. Revegetating abandoned mine plots as the operation proceeds is reasonable and will enable the operator to apply acquired knowledge to the revegetation of subsequent mine plots. Observations further suggest that revegetation will be easier to achieve on a series of small mine plots rather than as one large block.

Third, observations of abandoned mine plots indicate that the timing of revegetation efforts may be critical to success. This is especially apparent on some mine plots where fibric sphagnum peat remains at the surface. If revegetation is not initiated promptly in these areas, it may be very difficult to establish any type of vegetation at a later date.

Subpart 2. B. (2) is a standard by which the success of revegetation efforts can be measured and provides a means to evaluate compliance with these rules. The particular standard of 75% cover after five growing seasons is based on field observations made in 1984 and is in general accepted by the peat mining industry and the scientific community and therefore considered reasonable.

The requirement that vegetation be self-sustaining, and either regenerating or in a stage of natural succession is reasonable to ensure that it will provide permanent cover. The requirement that the vegetation be comprised of typical wetland species is to ensure a species diversity which is characteristic of the surrounding wetland areas.

It is reasonable to designate 5 years as a time when revegetation is determined to be successful or not successful. If the standards outlined in subpart 2. B. (2) are not met, remedial efforts must be initiated. It is prudent to correct an adverse situation at the earliest feasible point after which it develops, in order to prevent it from becoming more severe.

Subpart 2. B. (3) is a standard that applies to permanent open water areas. It is reasonable to require that open water areas have stable shorelines and a minimal fluctuation in water level. If these standards are not met, shorelines may be exposed to repeated wind and water erosion. Given the

unique setting of each mining area, the filling of a depression with water may be a gradual process that requires more than one year. To accommodate this natural phenomenon, 2. B. (3) allows that the filling process be complete and the water level stabilized within 5 years after the cessation of mining.

Subpart 2. C. discusses the amount of peat that will remain when mining ceases. Given the great diversity in the type of mining operation, the setting of the mining area, and the selected reclamation option, it is inappropriate to specify an amount of peat that applies generally to all operations. The amount of peat that remains will be determined at the time of permit application and will depend on the selected reclamation option and on the texture and type of the underlying soil. For example, if the landowner and the operator agree to a timber plantation after mining, there may be very specific requirements for the success of the plantation based on the type and depth of the peat as well as the nature of the underlying soil. In contrast, for a wildlife impoundment, it may be best to remove all peat within six inches of mineral soil. It is reasonable to address this question on a site by site basis when all pertinent information can be considered and a meaningful agreement reached.

Subpart 2. D. requires that plans to control post-mining water levels be implemented during deactivation. Water control, as discussed previously, is fundamental to the success of all reclamation options. Therefore, it is reasonable that detailed plans be required and that these plans be implemented during the deactivation process.

#### 6131.0130 CLEANUP.

The purpose of this section is to ensure the cleanup of the mining area after activities have ceased and to eliminate the hazards created by mining. The specific goals listed in subpart 1. are reasonable means of achieving these purposes.

Subpart 2. A. requires that cleanup measures begin as soon as resource removal has been completed. At this time the machinery and manpower needed to accomplish the tasks will be available on the site. To delay the cleanup of facilities for which no further use exists, is unreasonable and could cause liability problems by becoming an attractive nuisance.

Subpart 2. B. requires that cleanup measures be conducted in a manner which aids in attaining the approved post-mining land use. Appropriate management during this initial period of site restoration is important to ultimate reclamation success.

Subpart 2. C. is included because mobile equipment and debris left on the site is normally not compatible with deactivation activities and principles, and its removal within one year is reasonable.

Subpart 2. D. is included because 3 years is a reasonable period in which to accomplish the requirements. The provision for extension was included because some of the facilities might have a future use, and their value helps ensure that they will be maintained. It is necessary to remove the facilities which are listed in order to limit access and remove hazards for safety reasons, and to promote the establishment of vegetation.

## PERMIT REQUIREMENTS

## 6131.0140 THE PERMIT TO MINE PEAT.

Subpart 1. Because it is the policy of these rules (as stated in part 6131.0020) to negotiate a permit to mine based on site specific factors, a site visit is essential. It is reasonable that this be the first step in the application process for a permit to mine. The content of the permit application and other subjects related to the permitting process will be discussed at the preapplication conference. Every effort will be made to include other permitting authorities in this and subsequent meetings so that the applicant for a permit to mine will understand as fully as possible all requirements which must be met.

Subpart 2. is based on Minnesota Statutes, section 93.481, subdivision 1, which requires a permit to mine in order to conduct a peat mining operation.

Subpart 3. is based on Minnesota Statutes, section 93.481, subdivision 1 and is included to clarify that existing peat mining operations may continue production pending administrative action on permit applications, provided that such applications are made within 180 days of the effective date of these rules.

Subpart 4. is necessary since it is possible for peat mining operations to be carried out jointly by more than one person. Each such person may jointly participate in management decisions relating to the proposed mining operation. Therefore, it is essential that such persons be legally bound by the permit to the extent of their involvement.

## 6131.0150 PERMIT APPLICATIONS.

Subpart 1. requires that an application for a permit to mine be submitted in duplicate for use by the DNR's Hibbing and St. Paul offices. Portions of the required information may not be applicable for some operations. In these instances, the DNR will notify applicants accordingly.

Subpart 2. A. to D. requires documents that are necessary to determine the need for a performance bond. These documents are required by Minnesota Statutes, section 93.49.

Subpart 3. A. to D. requires information on the organizational structure of the applicant for a permit to mine. This information is required by Minnesota Statutes, section 93.481.

Subpart 4. A. is necessary because the commissioner will be making decisions involving the effect of mining on the environment. It is reasonable to request copies of environmental reports involving the proposed mining area for use by the commissioner and other DNR staff.

Subpart 4. B. Delineation of the mining area is necessary to inform the commissioner of the location and extent of lands which will be used for mining. The requirement of overlays to 7½ minute quadrangle maps is reasonable because overlays are an effective and simple way to present diverse types of information relating to a single area. Quadrangle maps are readily available and at a standard scale. The requirement that information be submitted for areas outside the mining area is necessary to determine the environmental setting of the mining area.

Subpart 4. B. (1). is necessary so that the commissioner can determine if and where a potential exists for the expansion of the mining operation to ensure that peat resources are not encumbered.

Subpart 4. B. (2). is necessary for the development and implementation of a reclamation plan for the mining area. Such information is essential for determining water appropriation and discharge locations which are major considerations in the mining and reclamation of a peat mining area.

Subpart 4. B. (3). is necessary because Minnesota Statutes, section 93.481, subdivision 1 (d) requires publication of the ownership of the mining area. It is reasonable to present ownership data on a map.

Subpart 4. B. (4). is necessary for siting purposes. Exclusion and avoidance areas are described in part 6131.0100. It is reasonable to present this information on a map.

Subpart 5. is necessary because Minnesota Statutes, section 93.481, subdivision 3 requires that a permit be issued for the operating life of the mine. Mining and reclamation maps and plans are a reasonable means to evaluate anticipated activities to be conducted during the term of the permit.

Subpart 5. A. requires maps and cross-sections because they are the most reasonable way to present the requested information. It is necessary that these maps and cross-sections contain information normally found on U.S.G.S. quadrangle maps because such information will facilitate the correlation of these maps to other required maps (see part 6131.0150, subpart 4, item B.)

Since there is a wide range in the size of mining operations, it is inappropriate to specify a scale for these maps that applies to all operations. It is reasonable that the applicant prepare these maps at a scale approved by the commissioner which is appropriate to the proposed mining operation.

Subpart 5. A. (1). is necessary to inform the commissioner of the location and type of the peat resource that will be mined under the permit to mine. This information is necessary for the commissioner to evaluate the proposed reclamation plan.

Subpart 5. A. (2). is necessary so that the commissioner will know where potential expansion of the mining operation or the development of surrounding mining operations may occur. Such information is reasonable to ensure wise use of the peat resource.

Subpart 5. A. (3). is necessary because the information required is the basis of the mining and reclamation plan. The requirement that the status of the features listed in 5. A. (3) (a) to (f) be shown at appropriate intervals will inform the commissioner as to the sequencing of mining and reclamation activities.

Subpart 5. A. (3) (a) to (f) are necessary because they are the basic features of the mining operation which require reclamation.

Subpart 5. B. is necessary because it describes the mining and reclamation plan proposed by the applicant.



Subpart 5. B. (1) (a) is necessary to provide information on the proposed sequence and schedule of mining and the types and amounts of peat that will be mined so that the commissioner may determine the term of the permit.

Subpart 5. B. (1) (b) requires a discussion of the beneficiating process. Such a requirement is reasonable since certain materials may require special handling. A discussion of waste disposal is necessary since Minnesota Statutes, section 93.47, subdivision 3 allow the commissioner to require the reclamation of disposed waste products.

Subpart 5. B. (2). is necessary to present the methods and schedules of reclamation so they can be evaluated and monitored by the commissioner.

Subpart 5. B. (3). is necessary to inform the commissioner of proposed research that may be used to demonstrate alternative reclamation procedures that meet the goals of the rules.

Subpart 6. is necessary to support the post-mining management plan, if required by part 6131.0120, subpart 2, item A.

Subpart 6. A. is necessary to document the landowner's experience in land management of the type required by the post-mining management plan.

Subpart 6. B. is necessary to document the reclamation responsibilities of both the operator and landowner. It is reasonable to require such information as it will ensure the long-term success of the reclamation.

6131.0160 ANNUAL REPORT.

Subpart 1. requires the permittee to submit an annual report describing the mining and reclamation activities performed during the past year as well as mining and reclamation activities anticipated for the upcoming year. The report in conjunction with yearly site visits is a reasonable method for the department to monitor compliance with the rules and permit to mine.

The annual report also serves as an opportunity for the permittee to inform the commissioner of any changes in the overall mining and reclamation plan. The permit to mine is granted for the operating life of the mine and is based on the permittee's best estimate of mining and reclamation activities at the beginning of the operation. It is not unusual for sales, product lines, and mining methods to change over a 20-25 year period such that modifications in the mining and reclamation plans are required. These changes can be brought to the commissioner's attention through the annual report.

Subpart 2. identifies the information required for the preceding calendar year that should be contained in the annual report. The law authorizing the rules requires that the commissioner evaluate on an annual basis the permittee's financial ability to perform reclamation obligations. Therefore, it is reasonable to request a statement documenting financial capability of the permittee. The remaining information requested (mining rate and activities, reclamation activities) is necessary in order to reasonably monitor mining and reclamation progress.

Subpart 3. identifies the information required for the upcoming calendar year that should be addressed by the annual report. The information requested is

generally similar to that developed by peat mining operators in the course of planning and conducting business activities. Such information (schedules and amounts of peat mined, types and amounts of process chemicals added, types and amounts of waste disposal, and reclamation activities) is necessary so that the commissioner can determine if the upcoming activities are consistent with the operator's permit to mine.

Subpart 4. requires that a map be submitted that depicts the status of mining, reclamation, and watershed modifications. It is reasonable to supplement the information requested in subparts 2. and 3. with a map that can be used in conjunction with the annual site visit. Some of the information requested is more easily described in map form than by written text. The map serves as a reasonable document for communicating some of the information required by the annual report.

#### 6131.0170 PLAN FOR DEACTIVATION.

In subpart 1., the purpose of the deactivation plan is to provide the commissioner with detailed descriptions of how an area will be converted from mining to a subsequent land use. The general reclamation plans which were presented in the application for a permit to mine may need to be updated or modified based on experience gained during mining. The deactivation plan therefore provides the opportunity to develop, modify, and make final, the plan for completing reclamation of the mining area. Because of this plan's importance, it must be approved by the commissioner in the same manner as if the permit to mine were being amended.

Subpart 2. It is reasonable to require that the deactivation plan be submitted two years prior to the deactivation of any portion of a mining area as final reclamation responsibilities, such as the development of final topography and water management structures, should be an integral part of the last stages of mining. Two years will also allow sufficient time for the commissioner to review the plan and grant final approval, and give the permittee ample time to schedule final reclamation activities.

The requirement to submit annual reports is waived after approval of the deactivation plan because of the detailed level of information expected in the plan. Items in subpart 2. A. to E. list the information the plan must contain.

Subpart 2. A. It is reasonable to require detailed reclamation plans, schedules, and designs because it will be through these means that conversion from mining to a subsequent end use will be accomplished.

Subpart 2. B. It is reasonable to request information on soils since this will influence the type of vegetation the area will support.

Subpart 2. C. The water table will influence the success of vegetation, and information describing it is therefore reasonable to request.

Subpart 2. D. Information describing water control structures such as ditches, settling ponds, dams, or weirs is essential, since these structures will regulate water levels. It is also reasonable to require information regarding maintenance of these structures, since their continual functioning may be crucial to the success of the subsequent end use.

Subpart 2. E. It is reasonable to require an update of the management agreement with the landowner, to ensure continued management of the area.

#### 6131.0180 REQUEST FOR RELEASE.

Subpart 1. describes the purpose of the request for release. The request for release initiates the process by which a permittee is relieved of any further responsibility for all or part of a mining area. Information provided in a request for release is used to evaluate whether the permittee has completed all of the reclamation responsibilities required by the permit to mine. It is reasonable for the commissioner to make a careful examination of those portions of a mining area requested for release, since once release is granted the permittee has no further reclamation or financial obligations for those areas.

Subpart 2. identifies the information that should be contained in a request for release. If maintenance (subpart 2. A.) is necessary to ensure the continued success of the reclamation plan, then it is reasonable that such provisions be detailed to the commissioner. It is reasonable to have a record of ownership of the mining area and the remaining facilities (subpart 2. B.) so that it can be ascertained who ultimately has responsibility for the land and any facilities that remain after release from the permit. A final map of the reclaimed mining area (subpart 2. C.) is reasonable and necessary to evaluate whether the permittee has met the reclamation requirements of the permit to mine. The items listed in subpart 2. C. (1) to (4) are all important aspects of the permit to mine and should reasonably be identified and addressed in the request for release.

## PROCEDURES AND STANDARDS

6131.0190-6131.0340

Minnesota Statutes, sections 93.44-93.51 list the various procedures which are associated with the reclamation of mined peatlands. These include: Permits to mine, variances, amendments, revocation, modification, suspension, cancellation, assignment, requiring a performance bond, appeal, and penalties for violation. In addition, these statutes outline specific procedures which the commissioner must follow, including time limits by which certain decisions or actions must be made or taken. The procedural portion of these rules (parts 6131.0190 - 6131.0340) are the same as those found in the rules for mining and reclamation of iron ore and taconite with the following exceptions: (1) the requirement to publish the names of mineral owners was deleted since peat mining is not expected to make the recovery of such minerals more difficult; and (2) numeric references were changed to conform to the numbering system of the peat rules.

Since no changes in the procedural portions were made by the legislature when the Mineland Reclamation Act was amended in 1983 to include mining of peat, it is reasonable to use the iron ore and taconite procedures (with the above noted exceptions) in the peat rules. In addition to the fact that the procedures are consistent with existing legislation, they have been proven effective in the iron ore and taconite permitting process.

The rules relating to mining and reclamation of iron and taconite underwent extensive review through a hearing process. Since they are now part of Minnesota Law via the rule promulgation process, it is not necessary to further address them in this statement of need and reasonableness.

## SMALL BUSINESS CONSIDERATIONS IN THE RULEMAKING PROCESS

Minnesota Statutes, section 14.115 (supp. 1983) require that the DNR consider and incorporate rule language that reduces the impact of the rule on small businesses to the extent that doing so would not be contrary to statutory objectives that are the basis of the proposed rule. According to the definition of "small business" in Minnesota Statutes, section 14.115, subdivision 1, all existing peat mining operations in Minnesota are small businesses. However, it should be recognized that small businesses mining peat in Minnesota can have substantial acres of peatlands under production. It is likely that a peat mining operation in the state could have the maximum acres (3,000) of peatland under production and still fall within the statutory definition of a small business.

Reclamation needs are more dependent on the location, size, mining and processing methods, and products of the mining operation than on whether the operator fits the definition of a small business. Notwithstanding the fact that small businesses can conduct large peat mining operations, the rules were written to minimize, where reasonable, the compliance and reporting requirements that could be a burden to small businesses mining peat while at the same time providing for the wise development and reclamation of the state's peat resources.

Minnesota Statutes, section 14.115, subdivision 2 require the department to consider five methods for reducing the impact of the rules on small business. These are:

- (1) the establishment of less stringent compliance or reporting requirements;
- (2) the establishment of less stringent schedules or deadlines for compliance

or reporting requirements;

(3) the consolidation or simplification of compliance or reporting requirements;

(4) the establishment of performance standards for small businesses to replace design or operational standards required in the rule; and

(5) the exemption of small businesses from any or all requirements of the rule.

The following is a discussion of how the rules have been written to accommodate these methods of reducing their impact on small businesses. As some of the methods are similar, they are grouped together for purposes of this discussion.

Methods 1, 2, and 3: Simplification of Compliance Schedules and Requirements.

As described in the purpose and policy section (part 6131.0020), these rules provide a framework within which specific permit compliance requirements will be determined. The mine design section (part 6131.0110, subpart 2.) provides an example. This subpart does not set forth requirements that may make it economically impossible for a small business but, instead, identifies four general guidelines that are reasonable for all peat mining operators to follow. The permit requirements necessary to achieve compliance with the mine design section will be less sophisticated for a small business conducting a small peat mining operation. For example, it is required that open water areas, upon abandonment, shall have stable shorelines and that water levels shall not fluctuate to expose large areas of land. For a small business mining peat, the size of open water areas upon abandonment will be correspondingly small. Therefore the mine design requirements to ensure stabilized



shorelines and minimal fluctuation of water levels will be proportionately reduced.

The site restoration section (part 6131.0120, subpart 2) identifies a number of reclamation options. These include a basic land stabilization option (planting vegetation on exposed soil surfaces) or more management intensive reclamation options such as timber production, biomass production, wildlife habitat, and agriculture. The latter four are considered more intensive options as they require continued land management to ensure their success. The basic land stabilization option will minimize the requirements of reclamation for small businesses. At the same time it provides for the stabilization of the land surface.

While the more intensive reclamation options are likely to be more difficult to achieve, one of these options, agriculture, may also be attractive to the small business peat operator. Currently there are some farmers that are either mining peat or plan to mine peat in conjunction with their farming activities. It is their intention to farm the mined peatland after some or all of the peat has been removed. Thus farming is a reasonable and cost effective land reclamation option for the farmer who practices peat mining as a means to improve the land and make it more suitable for farming in the future. For this reason, farming was included as a reclamation option.

#### Methods 1, 2, and 3: Simplification of Reporting Schedules and Requirements.

There are three reporting requirements in the rules. These are:

- (1) the permit application;
- (2) the annual report; and

(3) the plan for deactivation.

The department has reduced the reporting requirements as well as content requirements in these reports to a minimum while ensuring that adequate information is obtained for a reclamation permitting process. To further expedite the reporting procedures, the department is preparing a workbook for the permit application that will present to the applicant a step by step procedure for obtaining a permit to mine. In addition, DNR reclamation staff will hold a preapplication conference at the applicant's mine site in order to review with the applicant what information is necessary and where it can be obtained. This conference in conjunction with the workbook should streamline the application process by educating the applicant as to what information is required, why it is necessary, and where it may be obtained. This should eliminate costly and time consuming mistakes in submitting incorrect or unnecessary information.

A workbook will be developed for the annual report as well and DNR reclamation staff will be available to discuss its content requirements with the permittee on an annual basis. It is believed that at least a yearly report is reasonable in order that the department may be able to effectively monitor mining and reclamation success. To allow more than a year between submittal of reports (and associated field inspections) could result in the perpetuation of incorrect reclamation procedures (improper planting of vegetation) that could require intensive remedial efforts if not corrected immediately.

The plan for deactivation comes near the end of the mining operation. The department has not yet developed a workbook for the deactivation plan. However, it is the department's intention to do this and have workbooks

available for all applicants. Again, DNR reclamation staff will be available to assist in an explanation of the plan's requirements and thus simplify the reporting process.

Method 4: Establishment of Separate Performance Standards.

The rules do not contain separate performance standards for small businesses. As discussed earlier, the rules provide a context or framework in which permit design and operational standards are developed on a site specific basis. This permitting procedure should allow flexible but fair and effective standards to be applied to the small business operator.

The rules also incorporate a variance procedure that may be useful to the small business. By demonstrating to the department that strict enforcement of any portion of the rules would cause undue hardship or would be unreasonable or not feasible, and where the applicant (or permittee) provides an acceptable alternative to accomplishing the goals of the rules, the requirement of the rule may be waived. The rules are drafted with goal statements that parallel the design and reclamation requirements of each section. Thus with an understanding of the goal statements, the small business may propose alternative methods of complying with the rules. This variance procedure is contained within the procedural portion of the rules. As part of the metallic reclamation rules, the variance procedure has been used successfully by the small scam mining businesses.

Method 5: Exemption From Rules.

Minnesota Statutes, section 93.461 (c) exempts from compliance with the rules all peat mining operations 40 acres or less in size from which not more than

1,000 tons per year of air-dried peat are removed, unless the commissioner determines that there is potential for significant environmental effects from the peat mining operation.

Beyond this authorized exemption in the law, the rules do not contain any further exemptions except through the variance procedure described above. The department feels that further exemption is not necessary in light of the variance option as well as the fact that there are very few specific requirements in the rules. The development of permit requirements on a site specific basis takes into consideration the small business operator and should allow for an equitable and effective permitting program.

#### Effect of the Rules on Agricultural Lands.

Minnesota Statutes, section 14.11 require that the DNR consider the effect of the rules on agricultural lands. There will be little or no mining of peat on agricultural lands so these rules will have no effect. In addition, these rules do not apply to the agricultural use of peatlands.

#### Participation in Rulemaking.

In the preparation of these rules, the DNR has distributed preliminary drafts to all existing peat producers as well as potential peat developers the department has identified. DNR staff have visited all active mining operations in the state at least once to meet with the operators and landowners that will be affected by these rules. Some of their comments have been incorporated in subsequent drafts of the rules. Other comments and requests could not be incorporated as they would be contrary to the statutory objectives that are the basis of the proposed rulemaking procedure.

The peat mining industry in Minnesota and other interested parties have been informed at all stages in the rulemaking process. The Notice of Intent to Draft Rules was published in the State Register in August 1983. The Notice of Intent to Solicit Outside Information was published in May 1984. A copy of this notice and a preliminary draft of the rules were distributed to approximately 300 interested or affected parties. Based on comments received during the summer of 1984, a second draft was prepared and distributed again in October 1984. Finally, the Notice of Intent to Adopt Rules Without Public Hearing together with the final draft of the rules were published in the December 3, 1984 edition of the State Register. These were also distributed, along with the Statement of Need and Reasonableness, to all existing and potential peat producers in the state.

## BIBLIOGRAPHY

1. Anderson, M. L., and V. Kurmis. 1981. Revegetation of mined peatlands: I. Environmental properties of a mined area. Minn. Dept. of Nat. Res. 47 pp.
2. Farnham, R. S., and T. Levar. 1979. Agricultural reclamation of peatlands. Minn. Dept. of Nat. Res. 52 pp.
3. Green, P. E. 1983. Natural revegetation of mined peatland in northern Minnesota. M. S. thesis. Univ. of Minn. 120 pp.
4. Minnesota Department of Natural Resources. 1981. Minnesota peat program final report. Minn. Dept. of Nat. Res., Div. of Minerals. 93 pp.
5. Minnesota Department of Natural Resources. 1984. Peatland Reclamation Report No. 1. Minn. Dept. of Nat. Res., Div. of Minerals. 61 pp.
6. Minnesota Department of Natural Resources. 1984. Preliminary report on protection of ecologically significant peatlands in Minnesota. Minn. Dept. of Nat. Res., Div. of Minerals. 86 pp.
7. Minnesota Department of Natural Resources. 1984. Recommendations for the protection of ecologically significant peatlands in Minnesota. Minn. Dept. of Nat. Res., Div. of Minerals. (under preparation).
8. Stiles, T. C. 1982. Some water quality characteristics of dredge ponds in northern Minnesota peatlands. M. S. thesis. Univ. of Minn. 102 pp.
9. Twaroski, C. J., and V. Kurmis. 1982. Revegetation of mined peatlands: II. Field testing of grasses and site treatments. Minn. Dept. of Nat. Res. 107 pp.
10. White, E. H. 1980. Forestry reclamation of peatlands in northern Minnesota. Minn. Dept. of Nat. Res. 46 pp.